

Final Report: Research on PLA Modernization

In the period between April 1, 2013 and March 20, 2014, the Project 2049 Institute, pursuant of goals underlined by the Grant Agreement dated April 1, 2013 with Grantor Sasakawa Foundation, has conducted activities, including research and analysis of the PLA challenge to security interests of the US-Japan alliance going forward, and continues to fulfill the requirements set forth by the agreement.

Goals

In support of the SPF US-Japan Commission, the goals of this project are to analyze China's military modernization efforts and provide insight on how the PLA will challenge or complicate the security interests of the U.S.-Japan alliance going forward. With China rising in military prowess, regional security dynamics are shifting, and the strength of the US-Japan security alliance is being brought into question. In order to help commissioners understand the specific key areas of security challenges posed by the Chinese military, Project 2049 Institute has conducted future-oriented research on PLA modernization and produced products consistent with this goal.

Objectives

The objective of this grant is the analysis of five key areas of China's military modernization, including the following: 1) China's Long Range Precision Strike; 2) PLA Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR); 3) Nuclear Force Modernization; 4) Defense Acquisition and Technology System; and 5) PLA Leadership and Political Warfare. The Project 2049 Institute has carried out research of these five specific topic areas and presented them for briefing purposes at the SPF US-Japan Commission in June 2013 and in January 2014. In-depth papers were written for each five of the topic areas identified, and the Institute has successfully reached the goal of providing well-conducted research to assist the Commission in understanding the challenges posed by Chinese military modernization.

Activities

In June 2013, Project 2049 President and CEO Mr. Randall G. Schriver traveled to Tokyo, Japan in support of the SPF US-Japan Commission. During the inaugural meeting of the Commission, Mr. Schriver presented initial findings on the five identified topics regarding China's military modernization to the American and Japanese commissioners. Mr. Schriver's briefing successfully served to stimulate a 90-minute discussion and Q&A session.

In January 2014, Mr. Schriver again presented research findings on Chinese military modernization at the second meeting of the US-Japan Commission, providing the Commission with a more in-

depth analysis with written memos of the five focus areas, as well as other supplemental materials (See Appendixes 2 – 9). The briefing stimulated discussion among the commissioners during the Q&A session following the presentation. The commissioners confirmed their interest in further research on these identified topics, and looked forward to the further from Project 2049 Institute. They suggested other potential areas of research for follow-on work, including greater exploration of PLA gaps and weaknesses, as well as civil-military issues in China, topics that the Institute will take into account as research efforts continue.

Financial updates

- I. Senior Advisors: 3 senior advisors have assisted the research of this project. They include Richard Armitage, Kara Bue, and Robin “Sak” Sakoda.
- II. Travels: Project 2049 President and CEO Randall Schriver’s travel expenses were covered fully by SPF.

Outputs

The Project 2049 Institute, in preparation for the inaugural meeting of the US-Japan Commission, organized a presentation with insightful briefing slides regarding the five focus areas on China’s military modernization (See Appendix 1). For the second meeting of the US-Japan Commission, the Institute provided five briefing memos, each focusing on one of the five key areas identified in the objectives section (See Appendixes 2 – 7). In addition to the five memos, the Institute provided an op-ed written by Research Fellow Ian Easton titled, “Why the Chinese Military is Weak and Dangerous” (See Appendix 8). Lastly, a report published by the Project 2049 Institute in June 2013 – unrelated to this project – titled “Assessing Japan’s National Defense: Toward a New Security Paradigm in the Asia-Pacific” was included as supplemental information for the commissioners (See Appendix 9).

Conclusion

In conclusion, the Project 2049 Institute has fulfilled its goals and objectives for this project. The Institute has assisted the US-Japan Commission in reaching a greater understanding of China’s military modernization and the threat it poses to the US-Japan alliance. The Institute has conducted research on the five focus areas stated in the objective and developed five briefing memos (final product) on these topics accordingly. The Institute has assisted the Commission in both the inaugural meeting in Tokyo and the second follow-on meeting in Washington, D.C. The Institute is continuing to develop the five topic-areas and incorporating the suggested research topics recommended by the commissioners for the second year of the project.

Chinese Military Modernization

Prepared for the US-Japan Bilateral Commission
June 2013

Chinese Military Macro-Trends

- Annual double-digit increases in military budgets for over two decades
 - 10.7% (2013); 11.2% (2012)
- Taiwan contingency force modernization
 - Significant build-up since 1995/1996
 - Implications for Japan
- Anti-Access/Area Denial Capabilities
 - Air, sea, space, information warfare
- Extended-range power projection capabilities
 - Cyber, space, electronic and missile warfare
- Development of PLA's global missions capabilities
 - Peacekeeping, disaster relief, counter piracy
- Bilateral exercises with SCO members

Why These Focus Areas

- Chinese military modernization has important implications for the US-Japan alliance
- Subject is understudied
- Criteria for the five selected areas of study:
 - Increasingly consequential for the US-Japan alliance and known contingencies
 - Underrepresented in existing literature on PLA modernization

Five Focus Areas for 2013

- Chinese Long Range Precision Strike
- PLA C4ISR
- Nuclear Force Modernization
- Defense Acquisition and Technology System
- PLA Leadership and Political Warfare

Chinese Long Range Precision Strike

- Advanced capacity
 - Sensors, long range precision strike assets
- Second Artillery Force/Air Force/Navy
 - PRC warhead numbers debated (between 250 and 3000)
- Research on development and deployment
 - Modernization and organizational infrastructure



DF-21C



CJ-10

PLA C4ISR

- Command and control systems
 - Peacetime/wartime
 - Communications infrastructure
- Ground/air/space-based sensor architecture
- Range of surveillance
 - Space-based satellites
 - Airborne platforms
 - Land-based radar systems
 - Cyber surveillance
- PLA computer network operations

Nuclear Force Modernization

- PRC's growing nuclear arsenal
 - New nuclear capable delivery vehicles
 - New warheads
- PRC's nuclear force intentions and trends
- Organizational overview
 - Nuclear policy and planning community
 - Acquisition management and technology development infrastructure
 - Operational system

Defense Acquisition & Technology System



- Improved capacities
 - Research, development, acquisition coordination
- Transformation in PRC's defense industry
 - Response to Taiwan contingency in late 1990's
- PLA operational and technology requirements
 - Development process
 - Program management
 - Industrial engineering R&D

PLA Leadership & Political Warfare

- Political (and economic) means
 - Influence defense/security policies of Japan, US, and world
 - Undermine US alliance system
- Manipulation of perceptions
 - Exaggeration, deception, and misdirection
- PLA's GPD Liaison Department: responsible for political warfare
- Current and future PLA leaders
 - Qi Jianguo, Fan Changrong, Wei Fenghe



Zhang Yang, Director
of PLA General
Political Department
(GPD)

Shortcomings of the PLA

- Gap between aspirations and actual capabilities
- Lack of jointness across in the PLA
- National defense industries inadequate
 - Heavy reliance on Russian submarine, air defense and aircraft technologies
- Political indoctrination at the expense of professionalization
- Personnel quality and training problems

Implications for the US-Japan Alliance

- Alignment of US-Japan military concepts
 - Air Sea Battle and Dynamic Defense
- Joint development of future capabilities: missile defense, space, intelligence, and cyber operations
- Need for increased defensive measures for air bases in Japan
 - Hardening; Redundancy; Repair capabilities
- Need for a Japanese deep interdiction capability and amphibious force

INTRODUCTION

Over the past year, at the direction of the U.S.-Japan Joint Commission, our team at the Project 2049 Institute has conducted in-depth research on the Chinese People's Liberation Army (PLA). The purpose of this research is to investigate China's military modernization effort, and, in particular, those areas most relevant to the security interests of the U.S.-Japan alliance.

Per the guidance of the commission, we focused our efforts on five specific areas of study related to PLA modernization. These areas were chosen principally because we felt they would be the most consequential for the PLA's overall ability to challenge or complicate the U.S.-Japan alliance going forward. We also chose them because, despite their tremendous import, these five areas remained relatively understudied. These areas are presented in the five briefing memos that follow. The aim of the briefing memos is to highlight the most salient points of our research findings in a format that is easily accessible to the members of the commission, policymakers, and the general public alike.

Our first briefing memo covers Chinese long-range precision strike, assessing both the primary drivers of China's offensive missile build-up, and also introducing the capabilities themselves. Our second briefing memo explores the PLA's command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) architecture; something which underpins China's entire military modernization effort. Our third briefing memo looks at China's nuclear force modernization, an area generally considered to be highly opaque and off-limits to open source research. We buck this conventional wisdom by casting light on little known PLA organizations responsible for China's nuclear policy, strategic weapons research and development, and warhead storage and handling. Our fourth briefing memo discusses China's defense acquisition and technology system, using an aerospace industry case study to better understand how Beijing is improving its ability to research, develop, and field innovative military systems – including those of concern to Washington and Tokyo. And finally, our fifth briefing memo examines PLA leadership and political warfare, showing both how China's communist leadership controls its military and how it uses the PLA to influence foreign perceptions and decision-making.

Taken collectively these five briefing memos highlight areas of growing concern for the U.S.-Japan alliance. Indeed, much of our work is focused upon the most potentially dangerous aspects of China's military modernization program. However, that should not create the impression that China is a “ten-foot giant.” To the contrary, our research also reaffirmed that, its successes notwithstanding, China's military continues to suffer from glaring weaknesses that Beijing will be hard pressed to overcome. Some of these are discussed in an opinion editorial one of our research fellows recently penned. This op-ed is included here alongside our five briefing memos. Also included is a separate, report

we produced this past year which assesses ways in which the U.S.-Japan alliance could be strengthened to help off-set some of the more troubling aspects of China's military modernization.

As the events of the year proved, this initiative could not have come at a better time. Chinese activities in the East China Sea around the Senkaku Islands have greatly elevated regional tensions, and continue to lead many thoughtful observers to question whether China's rise will be a peaceful one. We should be optimistic that the U.S. and Japan can successfully balance against the inherent risks and uncertainties surrounding China's emergence as a regional power. However, as our research suggests, the PLA is not standing still, and much hard work will have to be done if we are going to stay ahead of it.

Our efforts seek to ensure that the commissioners are better informed in their endeavors to advise the United States and Japan so that our nations are well positioned to help the Asia-Pacific region reach an unprecedented level of prosperity, freedom, and stability in the next half century.

Best regards,

A handwritten signature in black ink, appearing to read "Randall G. Schriver". The signature is fluid and cursive, with a large initial "R" and "S".

Randall G. Schriver
President and CEO
Project 2049 Institute

CHINESE LONG RANGE PRECISION STRIKE

January 6, 2014

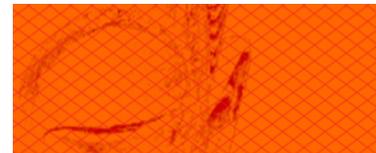


The People's Republic of China (PRC) is becoming a major economic, technological, military, and political power. Its emergence is changing regional security dynamics in the Asia-Pacific and affecting the world at large. Perhaps the most worrisome aspect to its comprehensive modernization program involves the PRC's investments into long range precision strike capabilities – ballistic and cruise missiles in particular. Such capabilities are intended to support the PRC's drive for increased domestic and international political legitimacy. They also support the construction of a military that is commensurate with China's rise as a global power.¹

The People's Liberation Army (PLA) is rapidly improving its ability to integrate sensors and long range precision strike assets in order to solidify the legitimacy of the Chinese Communist Party (CCP), and defend against perceived threats to national sovereignty and territorial integrity. Restrained by a relatively weak navy and air force, the PLA relies on the Second Artillery Force for achieving strategic goals through the targeting of enemy centers of gravity. The PLA's capacity for strategic power projection enables it to manipulate the cost-benefit calculations of opposing political and military leaderships. Moreover, an assured means of delivering nuclear weapons reduces the political saliency of opposing strategic forces.

Prior to the dissolution of the Soviet Union in 1991, the Second Artillery's mission was limited to projecting crude weapons of mass destruction. Since 1991, however, the Second Artillery has become a central and refined instrument of PLA warfighting. Armed with increasingly sophisticated ballistic and cruise missiles, the Second Artillery offers the PRC leadership an attractive means for delivering lethal payloads. Unlike ship and aircraft platforms, modern missiles are inherently difficult to defend against. They are also force multipliers. Missile attacks delivered directly against the critical nodes in an opponent's operational system allow for follow-on naval, air and ground operations to be carried out at greatly reduced levels of risk and cost. Air superiority above enables dominance on the surface below. With Second Artillery firepower support, PLA navy and air force assets may gain and maintain the air superiority needed to coerce political concessions or gain a decisive edge on the surface.

The Second Artillery's conventional reach is gradually extending throughout the Asia-Pacific region as it expands its brigade infrastructure and introduces increasingly



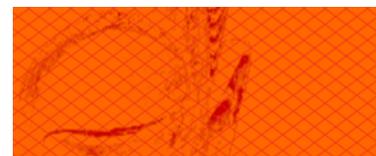
sophisticated missile systems into the inventory. Ballistic missiles capable of delivering conventional payloads with precision have a coercive effect on neighbors with limited countermeasures. The use of force against Taiwan has been the principle illustrative planning scenario guiding PLA and Second Artillery force modernization. Enjoying the broadest support within the CCP Central Committee and CMC, a Taiwan scenario allows the PLA to modernize its forces without precipitating neighbors to invest significant additional resources into deterrents and defenses. Over time and with an industrial surge in missile production, the same coercive military capabilities focused on Taiwan could be directed against South Korea, Japan, Philippines, Vietnam, Singapore, Australia, Thailand, India, and others in the region.

Emerging PLA anti-access/area denial (A2/AD) capabilities may complicate the U.S. ability to operate in the region. Anti-access threats, designed to prevent an opposing force from entering an operational area, include long-range precision strike systems that could be employed against bases and moving targets at sea, such as aircraft carrier battle groups. Area denial involves shorter-range actions and capabilities designed to complicate an opposing force's freedom of action. Extended range conventional precision strike assets could suppress U.S. operations from forward bases in Japan, from U.S. aircraft battle groups operating in the Western Pacific, and perhaps over the next five to 10 years from U.S. bases on Guam. Indeed, the Second Artillery already appears to have developed and deployed an initial capability for striking moving targets at sea, such as aircraft carriers and destroyers.

A demonstrated ability to complicate U.S. operations within the region reduces confidence in U.S. security assurances. As a result, U.S. allies and *ad hoc* coalition partners in the region may eventually face a dilemma: invest significant resources into counterstrike systems or adopt conciliatory policies under increasingly coerced conditions. For deterrence and defense, defenders require the means to strike any target within the battlespace from which PLA offensive missile operations are being launched. Like any military organization, a Second Artillery corps is an operational system, and one that is becoming increasingly complex. Like any operational system, the Second Artillery has single points of failure.

Drivers of PLA Precision Strike

Over the last 50 years, the Second Artillery has emerged as the PLA's principal force for carrying out strategic strike missions to consolidate the political legitimacy of the CCP, deter potential adversaries, and defend against perceived threats to national sovereignty and territorial integrity. A number of political and military drivers explain why the PLA has granted relative priority to the Second Artillery. First, long range precision strike capabilities – ballistic missiles in particular – support the CCP's quest for domestic and international political legitimacy. The PLA is a party army, and the Second Artillery is



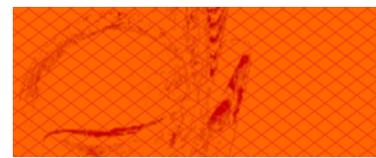
the party's instrument for achieving strategic effects through the direct targeting of enemy centers of gravity.

The most immediate challenge to the CCP's domestic and international legitimacy is Taiwan. Because Taiwan's democratic system of government – an alternative to mainland China's authoritarian model – presents an existential challenge to the CCP, China continues to rely on military coercion to compel concessions on sovereignty. Since the official establishment of the PLA's first conventional short range ballistic missile (SRBM) brigade in 1993, ballistic missiles have been a primary instrument of psychological and political intimidation, but also potentially devastating tools of military utility. As witnessed in 1995, the PLA launched four missiles off the coast of Taiwan as a warning to the island's politicians. Six months later, the *New York Times* reported explicit Chinese threats to conduct follow-on ballistic missile exercise strikes in order to deter perceived moves toward *de jure* independence by then-KMT President Lee Teng-hui and send a signal of Chinese displeasure to the international community. While many in Beijing appear convinced that the missiles were politically effective, others acknowledged that the exercises sparked worldwide anti-China sentiment, strengthened U.S. alliances in the region, re-invigorated the U.S.-Taiwan defense relationship, and hardened U.S. resolve to intervene in any future use of force against Taiwan.

A second driver is operational in nature. Constrained by a relatively underdeveloped aviation establishment, the PLA is investing in capabilities that may offset shortcomings in the face of a more technologically advanced adversary. Basic Chinese operational theory is founded upon the notion that unimpeded access to skies over a region not only enables operational success on the surface, but also has intrinsic value as an instrument of national power. Theater missiles, defined as conventional ballistic and land attack cruise missiles with ranges between 500 and 5500 kilometers, create a more permissive environment for PLA Air Force (PLAAF) and PLA Navy (PLAN) operations.

Among all PLA service branches, the Second Artillery best understands the art of nodal analysis, strategic targeting, and effects-based operations, competencies that are traditionally enjoyed by air forces. The PLAAF appears to be still in the early stages of transforming from a defense counter-air mission toward an offensive interdiction orientation. To date, PLA conventional air platforms have been insufficient by themselves to suppress air defenses, conduct strategic strike missions, or gain air superiority around the Chinese periphery. Increasingly accurate conventional ballistic and cruise missiles are the optimal means for suppressing enemy air defense and creating a more permissive environment for subsequent conventional air operations due to their relative immunity to defense systems.

Conventional long range precision strike systems also could enable political leaders in Beijing to apply effective military measures to enforce territorial claims in the East and



South China Seas. Theater missiles, including those tailored for the maritime environment, could enable the precise targeting of Japanese or other naval combatants that would have no defenses. An extended range strike capability would allow China to defend its interests in other parts of the world, including assured access to energy resources transiting through the Straits of Malacca and perhaps even the Indian Ocean.

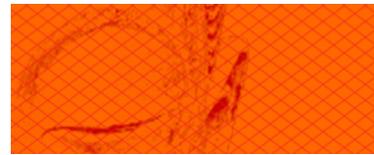
Missile strike operations also are viewed as a vital element of territorial air defense, with missiles intended to suppress adversary strike capabilities at their source. Along these lines, the Second Artillery is central to the PLA's strategy of complicating the ability of the United States to project global power and operate freely within the Asia-Pacific region. As strategic analyst Andrew Krepinevich observes, "since the Taiwan Strait crisis of 1996...China has moved to shift the military balance in the Western Pacific in its favor by fielding systems capable of driving up the cost of U.S. military access to the region to prohibitive levels." Theater missiles are essential for anti-access and area denial capabilities. Over time, conventional strikes against critical infrastructure in the continental United States, such as space-related ground stations, could further complicate military operations.

A final driver is technological. China's ability to leverage and absorb a global diffusion of technology has grown over the years. Much could be attributed to one particular program that may have facilitated the development of key technologies – the 863 Program. Under its 15-year "Medium- to Long-Term Plan for the Development of Science and Technology, China seeks to become an "innovation-oriented society" by the year 2020, and a technological leader by 2050. A conventional strategic strike capability could be one step in a longer journey to attain technological parity with the United States and the rest of the world.

Strike Capabilities

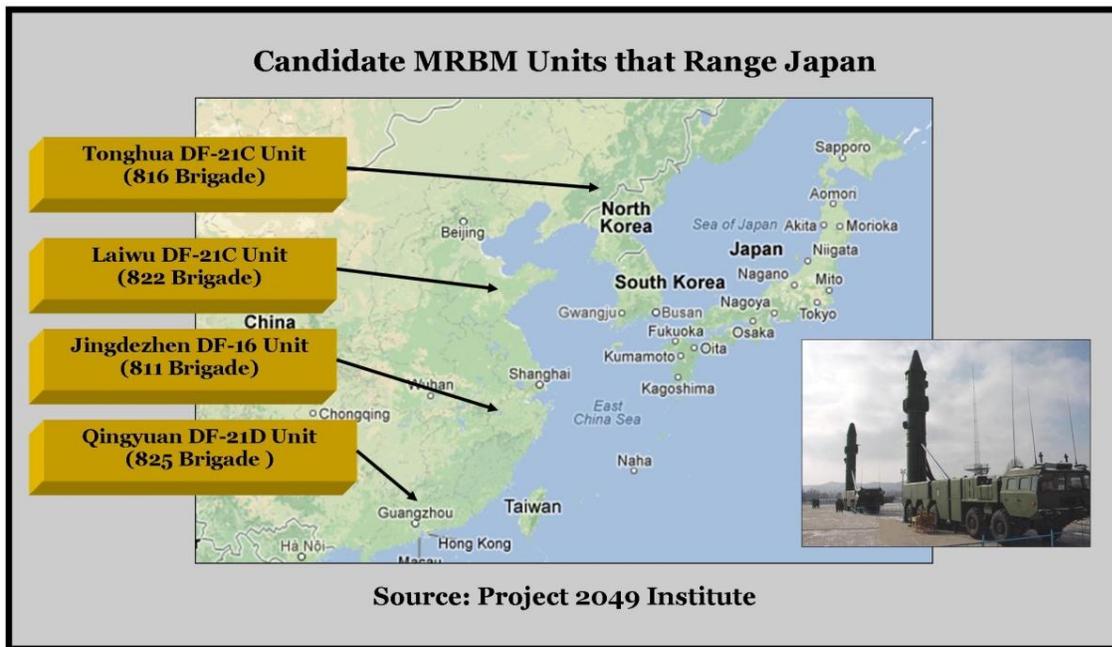
Ballistic Missiles. The PLA's Second Artillery Force fields the world's largest and most capable inventory of theater ballistic missiles for delivering nuclear and conventional strikes. In recent years, the Second Artillery has deployed an increasing number of conventionally armed ballistic missiles that have sufficient ranges to target virtually any point within 1,500 kilometers of China. These missiles are all solid-fueled and road mobile, making it difficult for a defender to predict when and where they will be launched. Further advancing their lethality, significant investments have been made into improving warhead accuracies and payloads while also developing methods to defeat ballistic missile defenses such as the Patriot-3 and Standard Missile-3 intercept systems fielded by Japan and forward deployed U.S. forces.

Initially, the only theater ballistic missile in the PLA arsenal that could range across the Western Pacific was the medium-range Dongfeng-21C (DF-21C). However, according to regional intelligence officials, the Second Artillery Force has also begun deploying a new

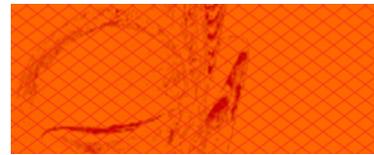


medium-range ballistic missile, the DF-16, which is reportedly aimed at “counter-intervention” missions. According to their assessments, the DF-16 would be primarily intended for targeting U.S. air and naval bases in Okinawa during a confrontation over Taiwan. The PLA is also extending the range of its DF-11 and DF-15 short-range ballistic missiles across from Taiwan, giving them notional coverage of increasingly large sections of the East China Sea. Of even greater concern, the Second Artillery began initial deployment of the DF-21D ASBM in late 2010. The purpose of the DF-21D is to threaten U.S. aircraft carrier strike groups operating in the Western Pacific. It could also eventually pose a threat to Japan’s Hyūga-class and Izumo-class helicopter carriers.

Looking ahead, the Department of Defense’s 2013 report on China’s military power assessed that the PLA is developing conventional intermediate-range ballistic missiles (IRBM) for near precision strike missions against targets from 3,000 to 5,500 kilometers away. These missiles could eventually be used to threaten the U.S. territory of Guam, the Marianas Islands, Palau, Northern Australia, Alaska, and U.S. bases in the Middle East and the Indian Ocean. If its conventional IRBM program is successful, it is possible that China could develop the means to threaten Hawaii and the West Coast of the United States with non-nuclear intercontinental ballistic missile variants by sometime in the early-to-mid 2020s.



Cruise Missiles. After decades of sustained investments in advanced cruise missile procurement, the PLA currently fields some of the world’s most advanced cruise missile systems. China has produced large numbers of ground-launched cruise missiles that are capable of standoff precision strikes. Having previously obtained cruise missile technology from Russia, the PLA in recent years has begun acquiring considerable



numbers of domestically built systems. These include the Second Artillery Force's ground-launched *Changjian-10* "Long Sword" (CJ-10) land attack cruise missiles (LACM); the PLAN's ground- and ship-launched *Yingji-62* "Eagle Strike" (YJ-62) anti-ship cruise missile (ASCM); and the PLAAF's *Yingji-63* (YJ-63) and CJ-20 LACMs.

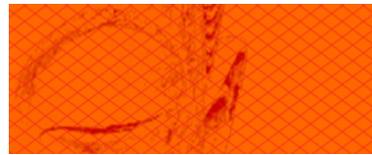
With up to 500 missiles deployed on some 55 road-mobile, tri-canister launchers in the Second Artillery Force, China's strategic CJ-10 LACM may be of particular concern to U.S. and Japanese defense planners. The CJ-10 is reported to have a stealthy design and a range of over 1,500km, giving the PLA the ability to notionally place all of Japan's main islands within the threat envelope of its cruise missiles. Likewise, the PLAN operates around 100 JH-7 fighter-bombers and some 30 H-6M maritime bombers that are armed with ASCMs. According to the Department of Defense, these could have a strike radius of over 1,500km. For its part, the PLAAF operates a small number of H-6K bombers equipped with LACMs that could have maximum strike ranges out to Guam.

At both the tactical and strategic levels, China's advanced cruise missiles have serious implications for regional security in the East China Sea and beyond. Like China's highly-successful ballistic missile systems, cruise missiles are technologically challenging (and expensive) to defend against. However, unlike ballistic missiles, cruise missiles are able to strike from any direction and fly at very low altitudes, making them even harder to detect and counter. Cruise missiles are also more accurate and inexpensive to build than ballistic missiles and, because of their relatively small size, can be launched from a variety of platforms, further adding to their stealth and agility. Like ballistic missiles, they also represent a major proliferation risk.



¹ For more information see Mark A. Stokes, "The Second Artillery and the Future of Long Range Precision Strike," in Ashley J. Tellis and Travis Tanner, eds., *Strategic Asia 2012-13: China's Military Challenge* (Washington D.C.: National Bureau of Asian Research, 2012);

Ian Easton and Randall Schriver, *Assessing Japan's National Defense: Toward a New Security Paradigm in the Asia-Pacific* (Arlington, VA: Project 2049 Institute, June 2013), accessible online at http://project2049.net/documents/assessing_japan_national_defense_easton_schriver.pdf; and Mark A. Stokes and Ian Easton, *Evolving Aerospace Trends in the Asia-Pacific Region: Implications for Stability in the Taiwan Strait and Beyond* (Arlington, VA: Project 2049 Institute, May 2010), accessible online at http://project2049.net/documents/aerospace_trends_asia_pacific_region_stokes_easton.pdf. See also Mark A. Stokes, *China's Evolving Conventional Strike Capability: The anti-ship ballistic missile*



challenge to U.S. maritime operations in the Western Pacific and beyond (Arlington, VA: Project 2049 Institute, September 2009), accessible online at http://project2049.net/documents/chinese_anti_ship_ballistic_missile_asbm.pdf; and Ian Easton, *China's Evolving Reconnaissance-Strike Capabilities: Implications for the U.S.-Japan Alliance* (Arlington, VA: Project 2049 Institute, forthcoming).

PLA COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS, INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE (C⁴ISR)

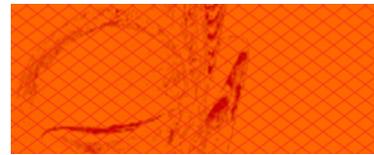
January 6, 2014



The Chinese People's Liberation Army (PLA) is engaged in a comprehensive modernization campaign that seeks to improve war fighting capabilities and overcome military deficiencies across the force. The development of strategic command, control, communications, computer, intelligence, surveillance, and reconnaissance (C⁴ISR) systems is an integral part of the PLA's modernization program. Areas of particular emphasis include the development of C⁴ISR capabilities supporting the PLA's family of long range precision strike assets for operations against targets operating in the land, maritime, and space domains.¹

Emerging C⁴ISR capabilities are designed to integrate and exploit the full potential of the PLA's new and expanding fleets of satellites, unmanned aerial vehicles, over the horizon radars, and cyberspace assets; while also enhancing its legacy platforms, such as patrol aircraft, maritime surveillance ships and submarines. According to Chinese military-technical writings, the networking of individual platforms and assets could provide the PLA with strategic capabilities that are far more valuable than the sum of their parts. For example, while recognizing that no individual platform in its inventory would be capable of detecting an approaching U.S. stealth bomber or fighter, the PLA aspires to achieve the capacity to defeat low observable (stealth) aircraft through the linking of multiple platforms and sensor networks.

While actual capabilities are uncertain, it is clear that the PLA is investing heavily in a complex network of C⁴ISR systems to connect the "sensors to the shooters" for near real-time missile raids on aircraft carrier groups and other mobile targets located approximately one thousand nautical miles away from firing units. In addition, the PLA continues to enhance its capability to find, track and target adversary satellites with a variety of kinetic and non-kinetic weapons. What follows is a brief summary of the PLA's C⁴ISR infrastructure, including an overview of related sensor platforms.



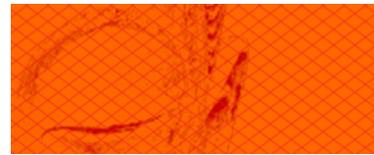
Command and Control

Guided by the Chinese Communist Party (CCP) Central Military Commission (CMC), the General Staff Department (GSD) would be the principle organization responsible for commanding and employing national-level PLA assets in a contingency situation. The GSD Operations Department (also known as the GSD First Department) manages the National Joint Operational Command Center and oversees a specialized contingency office to coordinate with civilian authorities during emergencies. The Operations Department also controls the national navigation and positioning system, meteorological and hydrological assets, and dual-use airfields. The Operations Department's Readiness and Force Development Bureau is responsible for a range of planning and security functions.

The GSD Intelligence Department (also known as the GSD Second Department) manages, or has access to, national space reconnaissance assets and joint unmanned aerial vehicles. The GSD Technical Department (also known as the GSD Third Department) has cognizance over a vast signals intelligence and computer network operations infrastructure. The GSD Informatization Department is responsible for developing, constructing, operating, and maintaining the PLA's nation-wide command and control communications system. It also has developed and fielded a platform that integrates sensors and other situation awareness assets for theater commanders. National-level assets for situational awareness would be leveraged through a system referred to as the Integrated Command Platform.

The employment of national-level PLA assets in response to a contingency would most likely be exercised through a Joint Campaign Command (JCC), an organization established when a military region is transformed into a war zone. A joint campaign is an organized military endeavor that seeks to achieve either total or partial contingency objectives in accordance with the strategic intent of the political leadership. It would consist of several elements, including assigned national or military region assets, objectives, planning, and command. Assets assigned to a JCC likely would be contained in CMC directives outlining strategic intent. These directives may in the form of "campaign principles" and "campaign decision". The "campaign decision" would include a "campaign resolution", which would outline the national PLA assets apportioned to the JTF, define the campaign phases, delineate responsibilities, and establish timelines for the achievement of operational objectives.

The primary mission of the JCC would be to plan and prepare for joint operations and exercise authority over national level PLA assets and corps-level components assigned to the JCC. A JCC would normally consist of CMC and other CCP representatives, GSD command elements, authorities from the other three General Departments, the Air Force, Navy, and Second Artillery Force. Direct CMC oversight of and integration with



the JCC ensures an orchestrated political-military strategy with access to CCP and state resources.

JCC employment of national assets would be carried out via a primary command center, which would be supported by reserve and rear command centers, and if necessary, a forward command center. The forward command post and the rear command center, which is responsible for logistics support, reports to the primary command center. The reserve post would assume duties as the primary command post if the latter is neutralized. A primary command center may consist of a communications center, a firepower coordination center, an intelligence information center, an ECM command center, and a weather center. The primary command center may have skip echelon authority and include representatives from each service for coordination.

Notionally directed by a JCC deputy chief of staff, the firepower coordination center may consist of a handful of firepower coordination cells made up by Air Force, Second Artillery, special operations, and ground force elements that would carry out necessary liaison with their respective corps-level service headquarters. Similar in function to the U.S. Joint Target Coordination Board, the firepower coordination center's most important function would be development of the master targeting plan.

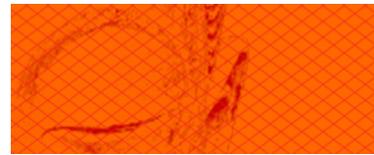
Communications and Information Systems

JCC communications authorities, most likely overseen by the GSD Informatization Department, would leverage military and national civilian telecommunications infrastructure as needed to establish a joint operational command communications network to support the command structure outlined in the campaign resolution. The communications centers would include representatives from the services and general headquarters as well as provincial telecommunications offices. The department oversees at least two division leader-level communications commands, the first in Beijing (61623 Unit) and the second in Xi'an (61068 Unit). Each communications command oversees a number of communications regiments.

Intelligence, Surveillance, and Reconnaissance (ISR)

Supporting the PLA's C4 infrastructure is an increasingly sophisticated network of space-based, airborne, and ground-based ISR sensors.

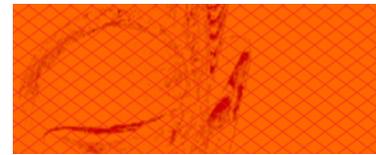
Space-Based ISR. Since 2009, the PLA has expanded its space-based sensor network. The PLA operates a growing fleet of space platforms for collecting imagery and signals intelligence and providing positioning, navigation, and timing (PNT) data. The PLA also appears to be invested R&D resources into space-based missile early warning and space situational surveillance, although the opacity surrounding China's military space program makes definitive judgments regarding payload missions difficult.



Imagery intelligence (IMINT) and signals intelligence (SIGINT) satellites are of particular significance. Recent IMINT satellite launches include those with electro-optical (EO) sensors for collecting digital imagery in the visual and near infrared spectrums; synthetic aperture radar (SAR) sensors capable of imaging targets through cloud cover and at nighttime; and stereo sensors for creating detailed, three-dimensional military maps. Chinese SIGINT efforts in space appear to center on a requirement to collect near real time information to support anti-ship operations. This information is principally delivered by naval ocean surveillance system (NOSS) satellites that find and track aircraft carrier groups. Three groups of NOSS platforms, which operate in small constellations of co-orbital satellites, have been launched by China since March 2010. Other signals intelligence sensors appear to have been launched for collecting electronic intelligence (ELINT) and possibly communications intelligence (COMINT).

Candidate ISR Satellites Supporting PLA Strike Operations		
Name	Launch Date	Satellite Type
<i>Yaogan 9 (A,B,C)</i>	Mar. 5, 2010	Naval Ocean Surveillance System (NOSS)
<i>Yaogan 10</i>	Aug. 10, 2010	Synthetic aperture radar (SAR) imagery
<i>Tian Hui 1A</i>	Aug. 24, 2010	Military mapping satellite
<i>Yaogan 11</i>	Sep. 22, 2010	Electro-optical (EO) imagery
<i>Shi Jian 11-03</i>	July 6, 2011	Unknown, possible early warning satellite
<i>Shi Jian 11-02</i>	July 29, 2011	Unknown, possible early warning satellite
<i>Hai Yang 2A</i>	Aug. 15, 2011	Dual-use ocean monitoring satellite
<i>Yaogan 12</i>	Nov. 9, 2011	Electro-optical (EO) imagery
<i>Shi Yan 4</i>	Nov. 20, 2011	Earth terrain mapping satellite
<i>Yaogan 13</i>	Nov. 30, 2011	Synthetic aperture radar (SAR) imagery
<i>Zi Yuan 1C</i>	Dec. 22, 2011	EO or SAR imagery satellite
<i>Zi Yuan 3A</i>	Jan. 9, 2012	Dual-use mapping satellite
<i>Tian Hui 1B</i>	May 6, 2012	Military mapping satellite
<i>Yaogan 14</i>	May 10, 2012	Electro-optical (EO) imagery
<i>Tian Tuo 1</i>	May 10, 2012	Military nanosatellite
<i>Yaogan 15</i>	May 29, 2012	Electro-optical (EO) imagery
<i>Shi Jian 9 (A & B)</i>	Oct. 14, 2012	Unknown military payload, possible ELINT
<i>Huan Jing 1C</i>	Nov. 18, 2012	Synthetic aperture radar (SAR) imagery
<i>Xin Yan 1</i>	Nov. 18, 2012	Unknown, possible NOSS
<i>Feng Niao (1 & 1A)</i>	Nov. 18, 2012	Unknown, possible NOSS
<i>Yaogan 16 (A,B,C)</i>	Nov. 25, 2012	Naval Ocean Surveillance System (NOSS)
<i>Gao Fen 1</i>	Apr. 26, 2013	Electro-optical (EO) imagery
<i>Shi Jian 11-05</i>	July 15, 2013	Unknown, possible early warning satellite
<i>Yaogan 17 (A,B,C)</i>	Sep. 1, 2013	Naval Ocean Surveillance System (NOSS)
<i>Feng Yun 3C</i>	Sep. 23, 2013	Meteorological satellite
<i>Kuai Zhou</i>	Sep. 25, 2013	Rapid reaction imagery satellite
<i>Shi Jian 16</i>	Oct. 25, 2013	Unknown
<i>Yaogan 18</i>	Oct. 29, 2013	Synthetic aperture radar (SAR) imagery
<i>Yaogan 19</i>	Nov. 20, 2013	Electro-optical (EO) imagery
<i>Shi Yan 5</i>	Nov. 25, 2013	Unknown

Sources: Gunter's Space Page, Space Daily, Project 2049 Institute

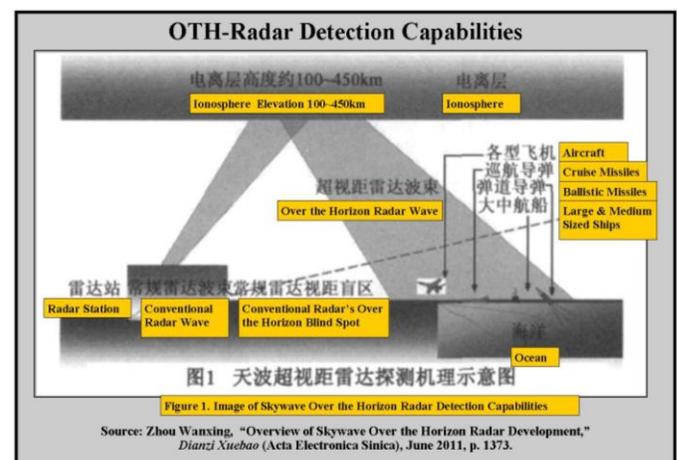


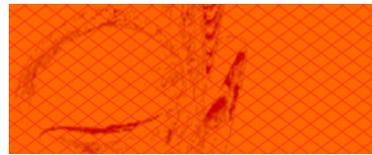
Airborne ISR. The PLA is investing into airborne ISR, including UAVs for maritime reconnaissance. According to Chinese officials, China plans to construct 11 UAV bases along its coastline by 2015 for maritime monitoring missions. As part of this program, the State Oceanic Administration (SOA) – now part of China’s coast guard – completed a trial program in 2011 that used UAVs in Liaoning Province to take aerial imagery of 980 square miles of sea area. Reportedly, the PLA Air Force has already begun to deploy UAVs for missions near the East China Sea, notably to an air base near Shuimen, Fujian. Authoritative estimates state that the PLAAF alone had over 280 UAVs in service by early 2011. More recently, the PLAN’s East Sea Fleet Aviation Branch began UAV flights near the Senkaku (Diaoyu) Islands. According to a retired Deputy Chief of the General Staff, China is likely to field over 1,000 medium and large sized UAVs in the coming years.

Looking farther ahead, Chinese UAVs will support the expansion of the PLA’s operational envelope, pushing its ISR capabilities farther out into the Western Pacific. Chinese sources note that UAVs provide the ability to engage in high altitude long endurance patrols unmatched by manned missions whose flight times are restricted by the limits of human endurance. A robust network of ISR mission capable UAVs, combined with satellites, surveillance ships, and other assets will make it increasingly likely that the PLA will be able to locate enemy fleets at greater distances, and, once discovered, track them continuously.

Ground-Based ISR. In addition to airborne and space-based sensors for maritime reconnaissance, over the horizon (OTH) radars are emerging as another important element of the PLA’s extended range air and maritime surface surveillance architecture. Managed by both PLAN and PLAAF operators, a network of OTH radar systems enables the PLA to detect aircraft

carriers, airborne assets, and other targets operating within range of the radar systems. Because OTH-B radars emit pulses off the ionosphere to illuminate a target from the top down, detection ranges can extend from 1,000 to 4,000 kilometers. Sea clutter and other resolution issues are likely to degrade the effectiveness of this system. Nonetheless, military technical writings produced by both Second Artillery and PLAAF affiliated engineers evince confidence in the utility of OTH-B for maritime early warning. While unable to provide precise targeting data to missile launch units, the PLA’s OTH-B radar systems could enable other sensors and ISR assets to narrow their search areas, greatly speeding up detection times.





¹ For more information see Mark A. Stokes, “Employment of National Level PLA Assets in a Contingency,” conference paper presented at the *Conference on Contingency Planning, PLA Style*, Arlington, VA, November 30 - December 1, 2012; Ian Easton and Randall Schriver, *Assessing Japan’s National Defense: Toward a New Security Paradigm in the Asia-Pacific* (Arlington, VA: Project 2049 Institute, June 2013), accessible online at

http://project2049.net/documents/assessing_japan_national_defense_easton_schriver.pdf; and

Mark A. Stokes, Jenny Lin and L.C. Russell Hsiao, *The Chinese People’s Liberation Army Signals Intelligence and Cyber Reconnaissance Infrastructure* (Arlington, VA: Project 2049 Institute, November 2011), accessible online at

http://project2049.net/documents/pla_third_department_sigint_cyber_stokes_lin_hsiao.pdf. See also

Ian Easton, *China’s Evolving Reconnaissance-Strike Capabilities: Implications for the U.S.-Japan Alliance* (Arlington, VA: Project 2049 Institute, forthcoming); and

Ian Easton and Mark A. Stokes, *China’s Electronic Intelligence (ELINT) Satellite Developments: Implications for U.S. Air and Naval Operations* (Arlington, VA: Project 2049 Institute, February 2011), accessible online at

http://project2049.net/documents/china_electronic_intelligence_elint_satellite_developments_easton_stokes.pdf.

NUCLEAR FORCE MODERNIZATION

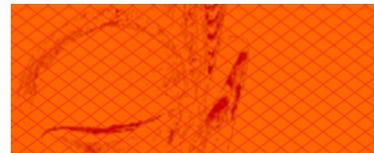
January 6, 2014



Nuclear warheads and their associated delivery vehicles represent the most powerful and potentially destabilizing weapons in the world today. The People's Liberation Army (PLA) is building a next generation intercontinental ballistic missile (ICBM), and the PLA Navy is gradually working toward the goal of fielding nuclear submarines capable of launching a new submarine launched ballistic missile (SLBM). As the United States and Russia continue a concerted effort to reduce the role and importance of nuclear weapons, China remains the only original nuclear weapon state that is increasing its arsenal. While estimates vary, the PLA may be expected to double the number of warheads available for deployment on missiles that could target the United States by the mid-2020s. China's declared policy is maintenance of a minimal deterrent and a no-first-use pledge. However, ambiguity surrounds how PLA planners define minimum deterrence, and the current and future scope of its nuclear warhead inventory.¹

A general consensus holds that China is increasing its arsenal, including the development and deployment of new nuclear-capable delivery vehicles. Yet questions remain as to the extent and intent of China's nuclear force modernization. An important first step toward better understanding can be found through research into the organizations and individuals responsible for nuclear policy, research and development, and storage and handling. An organizational map may facilitate an engagement strategy to reduce and ultimately eliminate the threat posed by nuclear weapons. Indeed, China is perhaps the least understood among the major nuclear powers. While much has been written on arms control-related organizations and China's nuclear doctrine, little publicly available material exists that details entities responsible for policy, force planning, acquisition, and maintenance of warheads, and associated components and material. A brief overview of China's nuclear weapons management system offers an organizational map of entities responsible for:

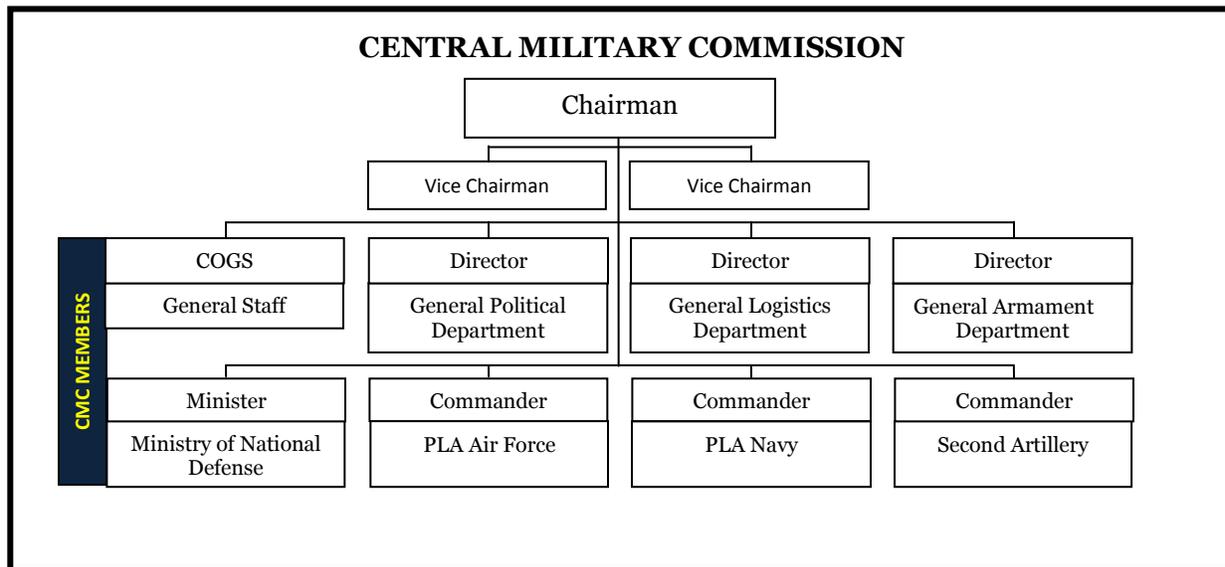
- Nuclear force policy and planning;
- Nuclear warhead acquisition and program management;
- Industrial design, engineering, and manufacturing;
- Storage, handling, and employment of nuclear weapons.



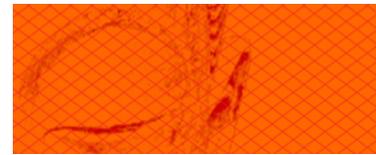
Nuclear Force Policy and Planning

Since China’s first successful nuclear test in 1964, the Second Artillery Force has been responsible to the CMC for achieving strategic effects through a capacity to deliver destructive firepower against enemy centers of gravity. The ability to hold enemy populations, economic centers, and critical military targets at risk support the CCP’s quest for domestic and international political legitimacy and military power that is commensurate with the PRC’s rise as a major global power. An assured ability to deliver a limited number of nuclear warheads reduces the political saliency of opposing nuclear forces, and enhances the CCP’s domestic and international legitimacy.

Authority over China’s nuclear force resides with the Central Committee Political Bureau (Politburo) and its seven-member Standing Committee. The CCP General Secretary, currently Xi Jinping, presides over the Politburo Standing Committee. The CCP Secretariat manages the Politburo’s daily operations and coordinates the implementation of central directives. Leading small groups coordinate management of selected policy issues across the party and state bureaucracies. The Politburo Standing Committee, Secretariat, and leading small groups rely heavily on the Central General Office for administration and oversight.



Central Military Commission. The Politburo exercises control over the armed forces, including nuclear forces, through the CMC. The CCP General Secretary is dual hatteed as CMC chairman who, along with two CMC vice chairmen, are among the Politburo’s 25 members. The CMC chairman and vice chairmen exercise authority over the military through four first level departments, specifically the General Staff Department (GSD), General Political Department (GPD), General Logistics Department (GLD), and General Armaments Department (GAD), the Ministry of National Defense,



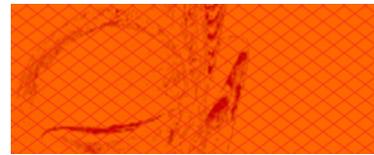
and the PLA Navy, Air Force, and Second Artillery Force. This administrative structure offers a high degree of uniformity and specialization. Leaders from each of these organizations are CMC members. Approval authority for nuclear weapons and other major programs likely resides with the CMC and a group referred to as the Central Special Committee, an *ad hoc* organization bridging the CMC and State Council.

Ministry of National Defense. The Ministry of National Defense (MND), which is under the dual leadership of the CMC and State Council, manages formal military-to-military relations with defense establishments around the world. The Minister of Defense is a CMC member with a State Councilor grade. The MND Foreign Affairs Office (MND/FAO) functions as the foreign affairs office of both the CMC and GSD. As such, MND/FAO controls formal military-to-military interactions between Second Artillery officers and counterparts around the world.

General Staff Department. Under direction of the PLA's Chief of the General Staff (COGS), GSD is responsible for day to day joint operations, intelligence, broad strategic planning, training, and mobilization. GSD concurrently functions as a ground force headquarters staff and oversees seven military regions. Regional components of the Air Force and Navy have a dual chain of command, reporting to their respective service headquarters departments as well as military region commanders. The GSD Operations Department oversees Air Force and Navy bureaus that are responsible for service coordination. The Second Artillery does not appear to have a command relationship with GSD. Unlike its Air Force and Navy counterparts, Second Artillery regional commands have no organizational relationship with the seven PLA military regions.

GSD provides intelligence support for nuclear force policy, planning, and operations. For example, the GSD Intelligence Department (GSD Second Department) collects and analyzes foreign nuclear forces and provides space-based reconnaissance data. The GSD Technical Reconnaissance Department (GSD Third Department) provides signals intelligence and cyber reconnaissance information.

Second Artillery Force. The CMC exercises direct operational authority over China's nuclear arsenal through the Second Artillery commander, who also is a CMC member. The Second Artillery Force functions as the CMC's executive authority for nuclear policy, planning, and operations. The Second Artillery Party Committee is the senior-most decision making authority within the Second Artillery. The Political Commissar and Commander function as the Party Committee secretary general and deputy secretary general respectively. Party committee members include three deputy commanders, three deputy political commissars, Chief of Staff, and directors of the Political, Logistics, and Equipment Departments. Formed in October 2004, a 21-member advisory committee advises the Second Artillery's leadership on political, operational, and strategic planning issues.



The Second Artillery Headquarters Department, which is directed by the Second Artillery Chief of Staff, appears responsible for developing operational requirements based upon general policy guidance from the Politburo Standing Committee, CMC, and Second Artillery Party Committee. While the PLA Navy and perhaps the PLA Air Force are expected to field nuclear-capable launch platforms, the Second Artillery will remain the CMC's executive authority for the development of nuclear force operational requirements and force planning.

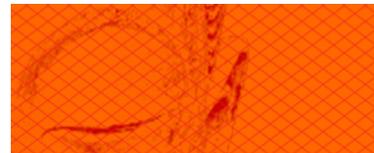
The Second Artillery Headquarters Department manages a command and control system that links the CMC and senior Second Artillery leaders with six regional missile commands and a central nuclear warhead storage and handling base in the mountains west of Xi'an. The six regional commands, referred to as missile bases, each oversee between three and eight missile brigades and at least five support regiments. The Second Artillery's primary command center appears to be located in Beijing's Western Hills. The Second Artillery Headquarters Department also oversees two engineering groups responsible for the tunneling of underground facilities and civil engineering: the 308 Engineering Command and the Engineering Technology Group.

The Second Artillery chief of staff directs the Headquarters Department. He is supported by three deputy chiefs of staff. At least one of the three deputy chiefs of staff has traditionally commanded the Second Artillery's nuclear warhead storage and handling complex. The Headquarters Department also manages a Nuclear Security and Control Bureau that likely coordinates with nuclear regulatory agencies within China.

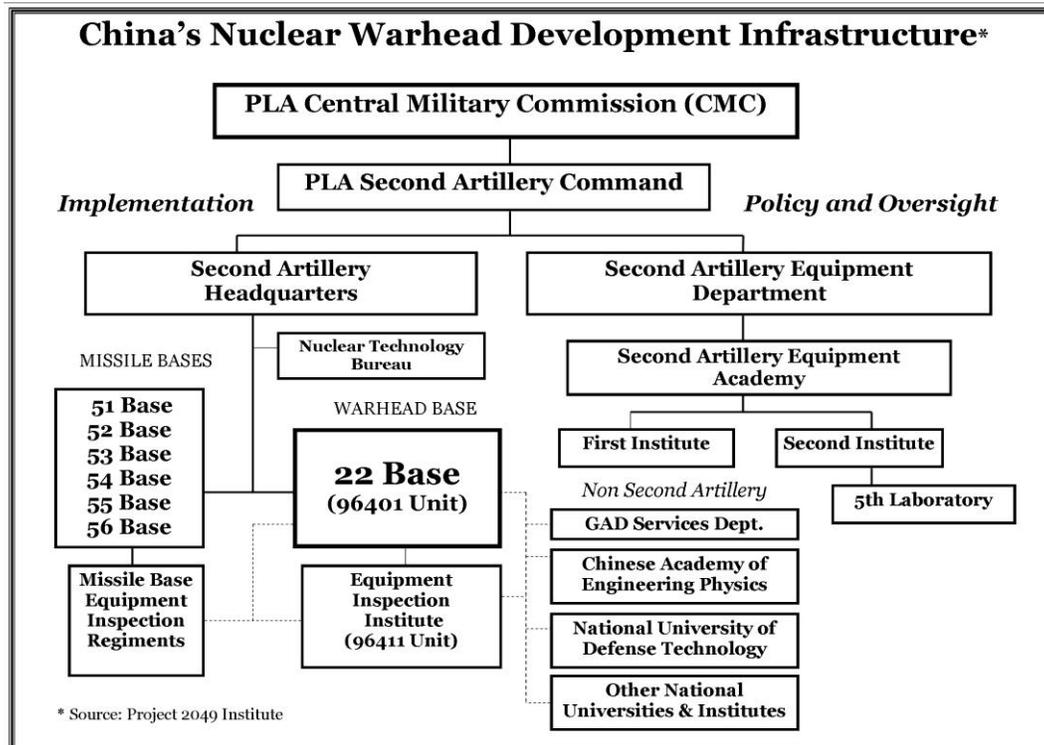
The Second Artillery Political Department manages day-to-day responsibilities of the Party Committee and ensures the CCP remains firmly in control of the PLA's nuclear forces. Based upon CMC-approved operational requirements and in accordance with GAD policies, the Second Artillery Equipment Department is responsible for planning and programming the acquisition of missile systems and warheads. More specifically, the Equipment Department's General Planning Department most likely develops nuclear warhead inventory requirements. The Equipment Department's Special Equipment Management Department may be responsible for coordinating nuclear warhead acquisition.

Nuclear Warhead Acquisition and Program Management

The PLA General Armaments Department (GAD), one of four PLA general departments, is responsible for establishing defense acquisition policies, developing technical solutions to satisfy operational requirements, and overseeing defense industrial research, development, and manufacturing. The Second Artillery Equipment Department and GAD are key PLA organizations responsible for warhead technology development and acquisition. Based upon CMC policy guidance and Second Artillery Headquarters Department operational requirements, the Second Artillery Equipment



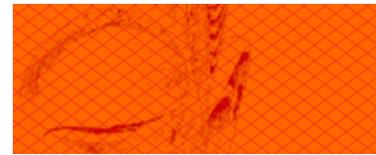
Department plans, programs, and executes the acquisition of missile delivery systems and associated nuclear payloads. The Second Artillery Equipment Department manages a subordinate research, development, test, and evaluation infrastructure. The Second Artillery Equipment Research Academy carries out technical feasibility and concept development studies on new weapon systems, and management of major acquisition programs.



Industrial Design, Engineering, and Manufacturing

GAD oversees a vast defense industrial system responsible for the detailed engineering design, R&D, and manufacturing of weapon systems for PLA end users. Defense industry R&D programs involve a dual command system involving a division of administrative program management and technical R&D. The Chief Designer and up to six deputy chief designers (or *directing designers*) bridge a vast supply chain. In the case of ballistic missile systems engineering, the Chief Designer usually is a senior authority within a CASC of CASIC academy's design department. However, a senior engineer from CASC or CASIC headquarters may lead larger, more complex systems engineering projects.

Within the systems engineering technical hierarchy, nuclear payloads appear to be supplied as a sub-system of a missile program. The China Academy of Engineering Physics (CAEP), under direct control of GAD, is responsible for nuclear warhead engineering R&D and manufacturing. Established in Beijing in 1958 as bureau-level



entity, CAEP facilities were transferred to Qinghai Province in 1960 and subsequently Sichuan in 1969. Also known as the Ninth Academy, CAEP employs 23,000 personnel, most of which are scientists and engineers.

Under the authority of the academy's party committee, CAEP leaders include the party committee chairman, director, five deputy directors, and the chief engineer who has technical management responsibilities. CAEP deputy directors support the director and generally oversee assigned portfolios. Deputy directors have served as chief designers for new warhead systems and as members of GAD Expert Working Groups.

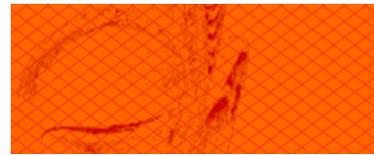
CAEP's S&T Committee advises the academy's leadership, GAD, and CMC on nuclear and directed energy R&D and manufacturing. Members include prominent engineers who have retired, yet still serve in a technical advisory capacity. Administrative departments supporting the CAEP director and deputy directors are responsible for integrated planning, training, propaganda, security, materials, information management, and other functions. The CAEP Program Management Office ensures warhead-related design, development, and production projects remain on track and on budget.

In recent years, CAEP has produced a number of prominent warhead designers. For example, Xu Zhilei has been credited as chief designer of a warhead used on two separate missile systems, presumably the follow-on variant of the DF-5 and DF-31. The CAEP research, development, and engineering communities are segmented into research institutes and centers. Each research institute oversees between six and 12 research labs. In addition, CAEP hosts as many as 15 national-level research labs, seven of which are directly under GAD management.

Storage, Handling, and Employment of Nuclear Weapons

Under the supervision of the Central Military Commission and Second Artillery Headquarters Department, the principle organization responsible for the storage and handling of China's nuclear warheads appears to be the Second Artillery's central warhead storage and handling complex, referred to as the 22 Base. Centralization allows for multiple, geographically isolated units to coordinate their efforts to tackle critical problems associated with warhead and missile readiness. The base command is situated in Baoji City in Sha'anxi Province.

The 22 Base leadership oversees a large infrastructure for warhead storage and handling. The 22 Base Political Commissar, Wang Dingfang, chairs the 22 Base CCP Party Committee, which, among a range of other responsibilities, allocates limited research and development funding in support of the 22 Base operational mission. The 22 Base's leadership oversees a number of brigade- and regiment-level organizations responsible



for various aspects of warhead stockpile management. The chief engineer of the 22 Base and his staff are responsible for technical aspects of the 22 Base mission.

Responsibility for day-to-day technical monitoring of China's existing warhead stockpile resides with the 22 Base Equipment Inspection Institute (96411 Unit). Granting particular attention to the core or "pit", the institute, which appears to be a brigade-level organization, likely performs engineering analysis and environmental testing to ensure that China's nuclear weapon stockpile remains safe and reliable. A separate regimental-level unit under the 22 Base command (96421 Unit) is responsible for managing the warhead storage depot facilities located in Taibai County, just south of Baoji deep in the Qinling Mountains.

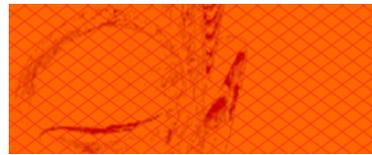
Yet another regiment (96422 Unit) is responsible for the transportation of warheads and associated materials. The Second Artillery Political Department allegedly has established requirements for PLA warhead engineers be able to operate for over three months in isolated underground bunker complexes. As a final note, the Second Artillery leadership also has expanded the role of the 22 Base to include emergency response to major nuclear and chemical contingencies. In the 2007-2008 timeframe, the 22 Base formed a Second Artillery Contingency Management Group as one of the PLA's premier organizations charged with responding to nuclear or chemical accidents. Carrying a military cover designation of the 96426 Unit, the group is headquartered in Baoji. Perhaps related, the civilian Taibai County government began stepping up emergency management planning in 2007. The Taibai County government also completed construction of an emergency-response command facility.

Launch Bases

The Second Artillery nuclear warhead storage and handling system encompass not only the 22 Base, but also facilities subordinate to each of the Second Artillery's six missile bases. Base-level warhead handling units are generally referred to as Equipment Inspection Regiments. Each regiment oversees at least three facilities, with each having as many as seven subordinate sites. The base-level Equipment Inspection Regiments appear to play a role in improving nuclear weapon safety, reliability, and service life. The Second Artillery Equipment Department, presumably in coordination with 22 Base authorities, has sought to integrate and standardize the inspection, repair, and maintenance of warheads and other major weapon systems throughout the force.

PLA Navy Nuclear Component

The PLA Navy is also a member of China's nuclear community. In addition to nuclear propulsion, the Navy is expected to manage platforms capable of launching nuclear weapons. Whether or not the Navy has or will manage an inventory of nuclear warheads



cannot be determined at the current time based on available information. However, the Navy does oversee a number of nuclear related organizations, such as the Navy Headquarters Department Nuclear Security Department and the Navy Equipment Department's Nuclear and Chemical Security Research Institute. The Navy also maintains a military representative office in CAEP's Mianyang headquarters. The PLA Navy's two nuclear submarine bases oversee subordinate missile technology commands, including specialized warhead groups. Responsibilities of the warhead group are unclear at the present time.

¹ For more information see Mark Stokes and Sabrina Tsai, *Managing China's Nuclear Warheads: The Policy Planning, Acquisition, and Operational Infrastructure* (Arlington, VA: Project 2049 Institute, forthcoming); Ian Easton and Mark Stokes, *Half Lives: A Preliminary Assessment of China's Nuclear Warhead Life Extension and Safety Program* (Arlington, VA: Project 2049 Institute, July 2013), accessible online at http://project2049.net/half_lives_china_nuclear_warhead_program.pdf; and Mark Stokes, *China's Nuclear Warhead Storage and Handling System* (Arlington, VA: Project 2049 Institute, March 2010), accessible online at http://project2049.net/documents/chinas_nuclear_warhead_storage_and_handling_system.pdf.

CHINA'S DEFENSE TECHNOLOGY AND ACQUISITION SYSTEM

AN AEROSPACE INDUSTRY CASE STUDY

January 6, 2014

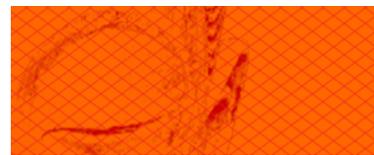


The People's Republic of China (PRC) is improving its ability to research, develop, and field innovative military capabilities and advanced weapon systems. Gradual improvements in China's defense technology and acquisition system is transforming the PLA into a modern military force capable of an increasingly diverse set of missions further from its shores. The PLA's force modernization is driven by careful consideration of long term operational requirements and an acquisition system increasingly capable of satisfying warfighter needs. Chinese policymakers view the aerospace sector -- space and missiles -- as a particularly important aspect of a broad international competition in comprehensive national strength and science and technology (S&T).¹

Operational Requirements

The operational requirements development system remains one of the most opaque aspects of PLA force modernization. Responsibility for generating weapon system requirements most likely resides with the end user, such as the General Staff Department (GSD), Navy, Air Force, and Second Artillery Force, based on Central Military Commission (CMC)-approved five, 10, and perhaps 15-20 year joint force planning documents. CMC management of military operations, political work, logistics, and acquisition and technology is exercised by four *first level* general departments: GSD, General Political Department (GPD), General Logistics Department (GLD), and General Armaments Department (GAD). The administrative organizational structure offers a high degree of uniformity and specialization across these four general departments, seven military regions, the Navy, Air Force, and Second Artillery Force. GAD is responsible for establishing general policies for acquisition and technology development. Approval authority for major programs sponsored by end users resides with the CMC and the Central Special Committee, an *ad hoc* organization bridging the CMC and State Council.

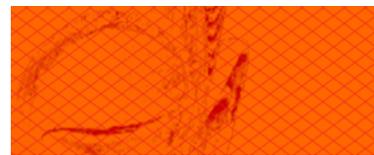
As the PLA's principle directorate for conventional military operations, GSD develops policies, plans, and programs, establishes or integrates requirements, and allocates resources to support CMC leaders and defend the interests of the Chinese Communist



Party (CCP). GSD concurrently functions as a ground force headquarters staff. Broad, long range force building plans most likely are coordinated on behalf of the CMC by the PLA Strategic Planning Department (SPD), a second-level department administratively subordinate to GSD. The department conducts long term analysis of the international security environment and future capabilities required to meet challenges. SPD may also be responsible for drafting and coordinating five, 10, and perhaps 15-20 year force modernization. SPD also may advise the CMC on broad budget priorities to support force transformation goals.

The end user of a particular system – selected second level departments within GSD, the Air Force, Navy, and Second Artillery Force -- most likely draft detailed operational requirements documentation based upon general force planning guidance. Each end user oversees a subordinate academy, institute, or office responsible for acquisition management. Within GSD, *second level* departments responsible for operational requirements development include:

- *GSD Operations Department.* In addition to managing day-to-day operations, the Operations Department (First Department) appears responsible for developing requirements for survey and mapping, hydrological, and meteorological support systems.
- *GSD Intelligence Department.* The Intelligence Department (Second Department) appears responsible for establishing requirements for joint intelligence, surveillance, and reconnaissance systems, including electro-optical and synthetic aperture radar remote sensing satellites and joint unmanned aerial vehicle platforms.
- *GSD Technical Department.* The Technical Department (Third Department) is responsible for communications intelligence systems and computer network operations.
- *GSD Informatization Department.* The Informatization Department is responsible for modernization of the PLA's joint command, control, and communications system.
- *GSD Electronic Countermeasures and Radar Department.* The Electronic Countermeasures and Radar Department oversees investments into electronic warfare modernization.
- *GSD Army Aviation Department.* The Army Aviation Department oversees modernization of the PLA's helicopter force.



The Navy, Air Force, and Second Artillery Force are responsible for establishing operational requirements and managing acquisition programs for weapon systems that are unique to each organization. Key organizations within each are referred to as *Equipment Research Academies*.

General Armaments Department

GAD, one of four first level PLA departments, is responsible for establishing defense acquisition policies that guide end user acquisition programs. GAD also invests resources into developing key technologies to satisfy operational requirements, and manages a network of weapons testing bases and labs supporting defense technology research, development, and manufacturing. The GAD S&T Committee functions as the CMC's principle advisory group for China's long term defense technology development. The S&T Committee is supported by more than 25 national-level technology expert working groups and defense R&D laboratories around the country. Presumably, their purpose is to leverage and pool resources to review technological progress, and advise on resource allocation. The labs function as platforms for military and civilian collaboration.

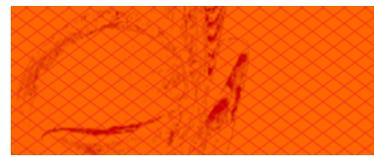
The GAD most likely develops requirements for launch vehicles, and manages space system acquisition on behalf of GSD. In the case of space launch operations, the GAD itself establishes operational requirements. While GAD is responsible for acquisition and technology policy, Equipment Departments under the PLA Air Force, Navy, and Second Artillery have been granted greater leeway in overseeing preliminary research, R&D, and testing. Within these departments, Equipment Research Academies appear to play a central role in program management and oversight of industrial R&D and manufacturing contracts.

Weapon Systems Acquisition

Based on general CMC-approved planning, programming, and budget guidance, end users manage major weapon system R&D and manufacturing in at least three phases: 1) concept development and program validation; 2) system engineering R&D; and 3) and design finalization and low rate initial production.

Concept Feasibility and Program Validation

Before investing R&D resources, the relevant acquisition authority conducts an assessment of the technical and economic feasibility of a capability and identifies key technologies. A critical component of feasibility and program validation is preliminary research. Preliminary research allows the mastering of mature technologies which in turn reduces R&D time and risk. Preliminary research can focus on generic technologies applicable to multiple systems across various enterprises, including telemetry,



aerodynamics, synthetic aperture radar, millimeter wave radar, GPS exploitation, hypersonics, and artificial intelligence or technologies applicable to a specific system, such as a movable spot beam antenna for a communications satellite or a new missile propulsion system.

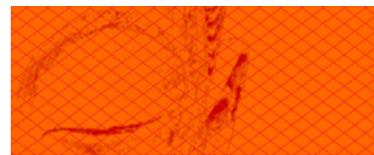
The 863 Program, ostensibly managed by the Ministry of Science and Technology (MOST), is an important source of extra-budgetary funding. The GAD manages selected aspects of China's 863 Program on behalf of the MOST. The 863 Program is intended to cut across organizational boundaries and break down stove-piped R&D efforts within China's defense S&T community. The 863 Program has served as a funding source for a range of R&D programs and as a mechanism to leverage the talent that resides in China's university system.

The Concept Feasibility and Program Validation phase ends with a senior level review of a feasibility report, conceptual design, and system development plan. Reviewers validate operational and technical specifications. Once approved, the program enters the Systems Engineering R&D phase.

System Engineering R&D

The concept feasibility and program validation process determines if risks have been sufficiently mitigated to move into the systems engineering R&D stage. Once a program is approved, end users, such as the GAD, Second Artillery, and the Air Force, conclude a contract with the appropriate division within a major defense industrial enterprise. These enterprises are responsible for space and missiles (referred to in this paper as the aerospace industry); nuclear technology, electronics and information technology, aviation, and shipbuilding, just to name a few.

Influenced in large part by Soviet defense industrial practices, China's defense industry has advanced significantly over the years. Administrative oversight of China's defense industry is exercised by the Ministry of Industry and Information Technology (MIIT). Formed in 2008, MIIT oversees the State Administration for Science, Technology and Industry for National Defense (SASTIND), which is administratively in charge of defense industrial enterprises that support military-related R&D, manufacturing, and follow-on support. SASTIND provides policy guidance to 11 state-owned defense industrial enterprise groups responsible for space and missiles, electronics, aviation, nuclear-related products, shipbuilding, and other sectors. SASTIND ostensibly seeks to foster greater competition within the defense industry in order to better meet the requirements of the PLA, as well as encourage greater civil-military integration. The State-owned Assets Supervision and Administration Commission of the State Council (SASAC) is responsible for financial oversight.



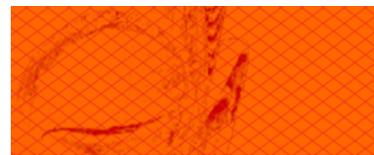
The systems engineering R&D phase involves programming, initial prototype research, and test prototype development. Programming assesses various alternatives that could best satisfy the approved operational and technical specifications. Technical requirements are set for sub-systems, as well as a plan for testing, design certification, standardization, reliability, safety, all within a set R&D budget. The phase ends with production of the Weapon System R&D Plan Report.

PLA acquisition program managers work closely with civilian defense industry counterparts, who are responsible for engineering R&D and manufacturing. The civilian lead systems integrator manages R&D and production through a dual chain of command that divides administrative and technical responsibilities. On the technical side, a chief designer and up to six deputy chief designers (or directing designers) bridge a vast supply chain. The chief designer usually is a senior authority within a subordinate defense industrial enterprise design department. The design team most likely is organized in accordance with the work breakdown structure outlined in the research academy's contract with the PLA user. Deputy chief designers are responsible for major sub-systems R&D and final assembly/manufacturing. Deputy chief designers usually are selected from research institutes or factories, and not within the chief designer's departmental chain of command.

The second position within the dual command structure is responsible for administrative program management. The program manager oversees planning, budgeting, personnel, material procurement, and bureaucratic coordination. He or she ensures the program stays on schedule, assures quality, and manages the program budget. Design and program management teams work closely together with PLA acquisition managers to ensure an economy of effort, timely production, and the cost effective use of resources.

Chinese defense industrial authorities have attempted to encourage competition among lead systems integrators, and contractors for sub-systems, sub-assemblies, and components. An initial step taken in 1998 was dividing each defense industrial ministry into two independent enterprises to encourage greater competition. In 2007, Chinese authorities announced guidelines for private, non-state owned enterprises to market and bid for PLA defense contracts for development, manufacturing, and logistics support for military systems. Supposedly, consideration also is being given to foreign-owned enterprises as well.

During an initial prototype research phase, a weapon system and its sub-systems are tested via simulation to verify technical performance parameters and provide the basis for eventual R&D and testing of prototypes. The phase also involves preparation for tooling for manufacturing of sub-systems and trial runs on samples. The phase ends



with determination of required component development task document, proposed flight test plan, and report of initial prototype phase.

During a test prototype phase, industrial engineers refine a conceptual design into a prototype that undergoes a certification process through testing of components, sub-systems, and overall system. Prototype tests are intended to validate system performance. In the case of missiles, a system enters the flight testing phase after successful ground tests, beginning with simple ones, and traversing through a series of increasingly complex tests. Integrated flight testing on missile systems are conducted from GAD-managed facilities. The phase ends with a formal application to a senior level committee for design certification.

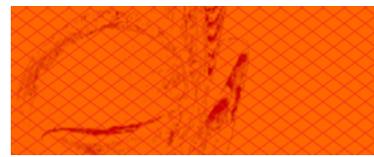
Design Finalization and Production

A design finalization phase involves evaluation of the system design, ability to meet operational and technical requirements. Ground and flight tests at specified ranges are carried out and evaluated in accordance with operational and technical requirements, General Missile System R&D Requirements, and the R&D Mission Document. After successfully completing flight testing, the system is reviewed by a design certification board. The program management team produces a System R&D Summary Report for review by an intermediate-level Design Finalization Committee. If approved, the system is reviewed by a first level Design Finalization Committee comprised of members of the State Council (premier or vice premier) and CMC. The committee reviews test data and ensures the system's performance satisfies requirements outlined in the TTP and R&D Guidelines, and certifies that a weapon system is ready to enter production. After approval, initial batch production proceeds with a particular emphasis on standardization, reliability, and quality assurance. Samples from low rate initial production are evaluated before proceeding with full rate production.

Aerospace Case Study

China's ability to overcome systems engineering challenges is best exemplified by large scale national level programs, including its manned space effort and key weapons programs such as the anti-ship ballistic missile (ASBM). The civilian defense industry supporting the PLA consists of at least 11 large enterprises. The aerospace industry is comprised of two of these enterprises: China Aerospace Science and Technology Corporation (CASC) and China Aerospace Science and Industry Corporation (CASIC). CASC and CASIC have been and likely will continue to be the most capable of researching, developing, and manufacturing advanced defense systems.

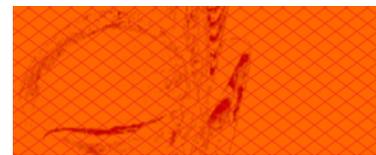
Integrated as a machine-building ministry until the mid-1990s, China's aerospace industry— CASC and CASIC -- serve as lead systems integrators and suppliers for the GAD and the services, including the Air Force, Navy, and Second Artillery. Both CASC



and CASIC are comprised of a number of research academies, which are roughly analogous to business divisions within U.S. defense corporations. Each research academy focuses on a core competency, such as medium range ballistic missiles, short range ballistic missiles, ICBMs and satellite launch vehicles, cruise missiles, and satellites. CASC/CASIC academies are organized into design departments; research institutes focusing on specific sub-systems, sub-assemblies, components, or materials; and testing and manufacturing facilities. Each academy is accountable for profit and loss, and includes an information collection and dissemination institute that diffuses technical information attained from abroad and elsewhere within China.

China's relative potential for fielding disruptive aerospace technologies is due to a number of factors. Perhaps most important is the historical legacy of China's space and missile program its record of success. Secondly, organizational and management system sets the industry apart from other sectors. The basic guidelines for China's aerospace R&D strategy were established in the 1960s and entail a phased approach involving three variants of a system to be in the R&D cycle at any one time. Under this concept, the variants should be in three increasingly advanced stages of R&D: 1) preliminary research; 2) system R&D involving design, development, testing, design reviews, and then finalization of the design; and 3) low rate initial production. This concept is sometimes referred to as a "three moves on a chess board" approach because it assumes that a follow-on variant will enter the R&D phase once full rate production begins and initial units are equipped with the basic variant. As a consequence, China's aerospace R&D strategy has the potential for pushing new technologies onto operational users in an incremental fashion, even in the absence of a clear operational requirement. However, this strategy also ensures that the PLA's space and missile systems are constantly being upgraded.

In addition, political factors, such as the special status of the industry and its primary customer – the Second Artillery Force –and national pride in its space program are other contributing factors. For example, the Second Artillery Equipment Research Academy was formed in December 2003 in order to better leverage available technologies for the purpose of force modernization and to integrate the activities of stove-piped research institutes. Its five subordinate research institutes conduct feasibility studies and develop concepts for new missile systems, and oversee industrial R&D and testing. The first known competitive tender for an R&D contract appears to have been in 2002. Program management of larger, more complex systems is handled at the Equipment Research Academy headquarters level, while sub-systems are managed within the Academy's research institutes. The Second Artillery Equipment Department also hosts defense industrial representative offices in selected aerospace industry academies, industrial research institutes, and factories.



Missile system acquisition and technology development programs are generally divided into three program elements: 1) the missile system; 2) the fire control system; and 3) the technical support equipment. The missile system includes the structure, propulsion, guidance, and control sub-systems. The fire control system includes command and control, communications, computers, and intelligence, surveillance, and reconnaissance, as well as launch platform (e.g., TEL or silo). Technical support equipment includes telemetry, support vehicles, and power supply.

The Second Artillery Equipment Research Academy works closely with CASC and CASIC research academies, systems engineering departments or institutes that are responsible for the design of future weapons systems and projects. Chief designers work out of these organizations and have a variety of functions. First, with input from subordinate institutes and other entities, they offer systems development recommendations to industry leadership, the GAD, State Council, and CMC. They analyze technical options and, as industry planners, provide influential recommendations on national level mid-to long-range plans and developmental objectives. The departments also support individual chief designer offices within the department. In addition, systems design departments are responsible for program evaluations and reviews and for overall quality control. A program centers on initial prototype design, engineering prototype design, and then test prototype design, along with associated testing in all phases.

In summary, a weapon systems acquisition that is in the R&D phase is assigned a chief designer, a small handful of deputy chief designers, and a program manager. The chief designer and his deputies coordinate the efforts of dozens of suppliers, while the program manager manages budgetary and other administrative issues. The R&D phase draws to a close once a design is “finalized” after successful flight testing and approved by a PLA GAD or service-led program review committee. After design finalization, a missile system enters into low rate initial production and, in the case of the Second Artillery, is assigned to a test and evaluation unit.

¹ For more information see Mark Stokes, *The Chinese Design and Systems Engineering System: Case Study of the Space and Missile Industry* (Arlington, VA: Project 2049 Institute, forthcoming). See also Mark Stokes, *China’s Evolving Conventional Strategic Strike Capability* (Arlington, VA: Project 2049 Institute, September 2009), accessible online at http://project2049.net/documents/chinese_anti_ship_ballistic_missile_asbm.pdf.

PLA LEADERSHIP AND POLITICAL WARFARE

January 6, 2014

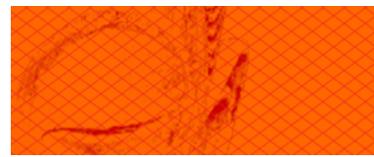


The Chinese Communist Party (CCP) exercises control over China through the CCP Political Bureau (Politburo) and its seven-member Standing Committee. The People's Liberation Army (PLA) is the political-military arm of the CCP. As of 2013, the Central Military Commission (CMC) chairman and two vice chairmen are among the Politburo's 25 members. The CCP Secretariat manages the Politburo's daily operations and coordinates the implementation of central directives. Leading small groups also play a role in coordinating across the party and state bureaucracies. The Politburo Standing Committee, Secretariat, and leading small groups rely heavily on the Central General Office for administration and oversight.¹

The Politburo exercises control over the military through the CMC and the PLA General Political Department (GPD) political work system. CMC management of military operations, political work, logistics, and acquisition and technology is exercised by four first level departments: the General Staff Department (GSD), GPD, General Logistics Department (GLD), and General Armaments Department (GAD). The PLA's organizational structure offers a high degree of uniformity and specialization across its four general departments, seven military regions, the Navy, Air Force, and Second Artillery Force.

The most politically powerful organization within the PLA is the GPD. The GPD's power stems from the PLA's status as a party army, its political position within the Communist Party, and its role in ideological indoctrination. GPD also exercises control over the PLA's contribution to domestic security through its exclusive representation on the CCP Political and Legal Committee. Representatives of the PLA political work system often are members of provincial, municipal, and county level party committees. As the executive agent of the CCP for political loyalty and ideological discipline within the military, GPD also has been represented on party-state policy coordination bodies. Over the decades, GPD officers have filled senior CMC executive staff billets, particularly within the CMC General Office.

The GPD leadership oversees functional organizations, referred to as second level departments, which are directed by an officer with a grade equivalent to a corps leader. PLA officers, and the billets to which they are assigned, have both a rank and grade. The latter is more important than rank in assessing the protocol position of an officer and



his organization within the party, state, and military bureaucracy. The civilian party-state apparatus has a parallel grade structure that is used to judge relative positions. Chinese political culture is characterized by consciousness of ranks or grades that earmark the relative standing of individuals, bureaucratic organizations, state-owned corporations across party, state, and military boundaries. The grade system determines chain of command within GPD, as well as horizontal relationships with other PLA general departments, services, the Second Artillery Force, and civilian party-state organs. Comparative civil-military grades are particularly relevant in the case of the GPD liaison work system, which appears to assign officers to civilian departments.

PLA GENERAL POLITICAL DEPARTMENT LEADERSHIP



GEN Zhang Yang

张阳

Director
12/ 2012 – Present

b. 1951



GEN Jia Ting'an

贾廷安

Deputy Director
1/ 2008 – Present

b. 1952



GEN Du Jincai

杜金才

Deputy Director/
CMC Discipline Inspection
Committee Secretary
12/ 2009 – Present

b. 1952



GEN Wu Changde

吴昌德

Deputy Director
6/2011 – Present

b. 1952



Lieutenant General (LTG) Yin Fanglong

殷方龙

Deputy Director
10/2012 – Present

b. 1953



LTG Cui Changjun

崔昌军

Assistant to the Director
12/2012 – Present

b. 1953

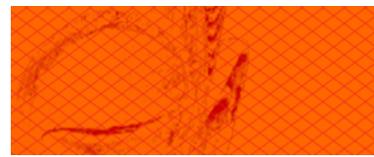


VADM Cen Xu

岑旭

Assistant to the Director
12/2012 – Present

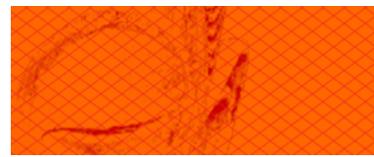
b. 1953



Overview of the General Political Department

The GPD is managed by a director, four deputy directors, and two assistants to the director. The former commander of the Guangzhou Military Region, GEN Zhang Yang, has directed the GPD and served as a member of the CMC since 2012. The four GPD deputy directors have a grade equivalent to a military region leader. GPD also oversees political academies located in Nanjing and Xi'an. Each deputy director is assigned a portfolio involving oversight of two or three of the GPD's 11 second-level departments.

- **The General Office** provides executive support for the GPD leadership. A secretary-general and a deputy secretary-general oversee General Office affairs, including a Foreign Affairs Bureau that is responsible for managing direct exchanges between GPD elements and counterpart organizations, including participation in international law conferences and other events.
- **The Cadre Department** oversees officer personnel management, including policy and planning, evaluations, approval of promotions, retirements, and other personnel actions. In line with its responsibilities, the Cadre Department maintains files on each officer in the PLA.
- **The Organization Department** is tasked with the management of political work and party affairs system of the PLA. The department plays a significant role in personnel management and coordination with party committees that exist throughout the PLA. Former Organization Department Director, MG Qin Shengxiang, directs the CMC General Office, which provides executive support to the CMC leadership, including CMC Chairman and CCP General Secretary Xi Jinping.
- **The Propaganda Department** carries out domestic political education work, and manages overt propaganda in support of military diplomacy. The GPD Propaganda Department External Propaganda Bureau, also referred to as the MND International Communications Bureau, was formed in 2006.
- **The Security Department** has law enforcement responsibilities, including crime prevention, criminal investigation, counterintelligence, personnel background investigations, political reliability assessments, and safeguarding of classified military information. In addition to performing staff functions related to the CMC/GSD Central Guards Bureau, the Security Department also oversees the PLA's prison and re-education system.
- **The Subordinate Work Department.** The Subordinate Work Department oversees GPD-subordinate corporate enterprises and a number of miscellaneous organizations. These include the Military Museum, PLA Art Academy, August 1st Studio, PLA Publishing House, PLA Pictorial Magazine, PLA Daily, PLA Literary Art



Publishing House, PLA Song and Dance Troop, PLA Opera Ensemble, PLA Play Ensemble, PLA Band, PLA Sports Team, Xinhua News Agency (PLA detachment), China Central Television (CCTV) Military Department, and China National Radio Military Department.

- **Legal Oversight Organizations.** Three other organizations are responsible for discipline and military law. The Discipline Inspection Department functions as inspector general, and supports the CMC's Discipline Inspection Commission in investigating corruption and other improprieties. The PLA Military Court and Military Procuratorate manage the PLA's justice system. The PLA Military Court is said to play an important role in an evolving concept referred to as legal warfare.

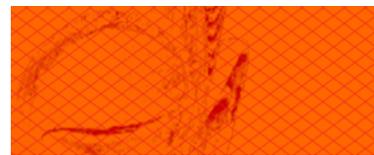
GPD Leadership and Political Warfare

The GPD chain of command runs up through the GPD Director to the CMC chairman and CCP chairman. One of three or four GPD deputy directors likely is assigned political warfare work as part of his portfolio.

What is Political Warfare?

Political warfare is a critical component of Chinese security strategy and foreign policy. Chinese political warfare seeks to influence emotions, motives, objective reasoning, and behavior of foreign governments, organizations, groups, and individuals in a manner favorable to Beijing's own political-military objectives. The PRC and the PLA rely on political warfare as a means to shape and define the discourse of international relations. Guided by the doctrinal principle of "uniting with friends and disintegrating enemies," Chinese political warfare adopts active measures to promote the rise of China within a new international order and defend against perceived threats to state security. Political warfare employs strategic psychological operations as a means of leading international discourse and influencing policies of friends and foes alike. Propaganda, carried out both during peacetime and in armed conflict, amplifies or attenuates the political effects of the military instrument of national power.

International friendly contact – the establishment and sustainment of personal rapport with foreign defense-related elites – is another critical aspect of political warfare. In coordination with the foreign affairs community, international friendly contact fosters sympathy, glosses over differences, stresses shared values, and expands influence among elites positioned to influence defense policies. Rapport with selected opinion leaders is a critical element of effective propaganda. Targeted elites may include retired senior military officers, former members of Congress and other legislators, prominent defense academics, among others.

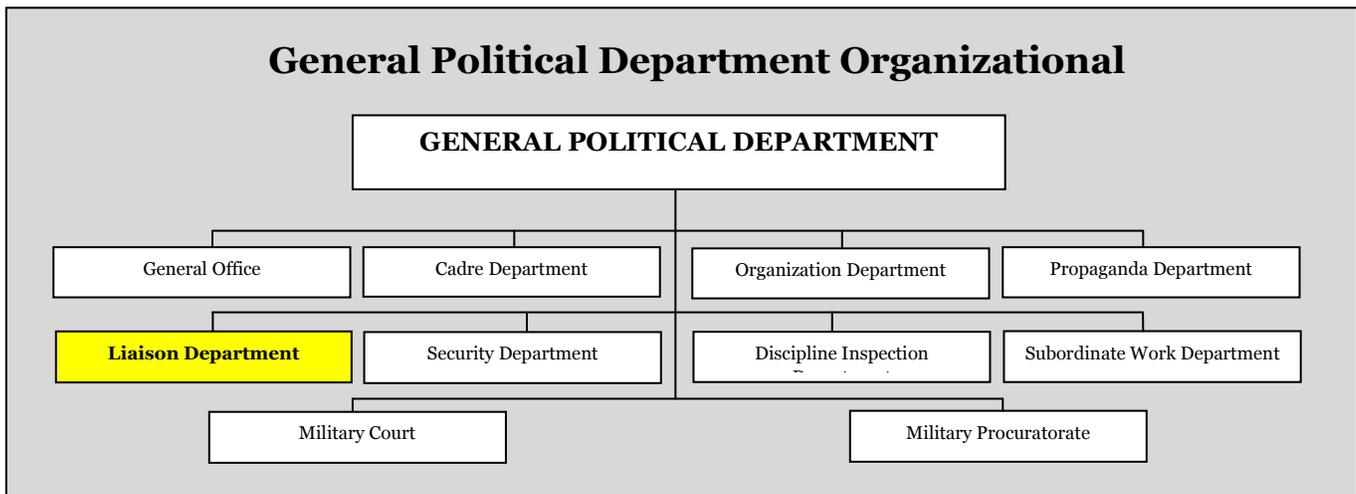


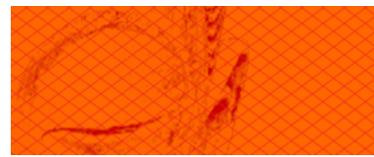
Subversion is the flip side of friendly contact work. Ideological subversion, referred to as disintegration work, targets political cohesion of alliances, coalitions, societies, and defense establishments. Augmenting the hard aspects of military operations, political subversion work includes educating and training domestic civil and military authorities on the value of disintegration operations. The planning process involves targeting of individuals or groups, and establishment of goals, requirements, channels, and methodologies. Working closely with military warfighters, GPD units are responsible for exploiting political and psychological vulnerabilities, as well as management of prisoners of war in an actual conflict. Leveraging propaganda and other means, disintegration work seeks to undermine an opponent’s national will through the targeting of ideology, psychology, and morale.

The GPD also seeks to counter external political warfare. In such efforts, the focus is placed on countering adversarial strategies that seek to Westernize and weaken CCP control through peaceful evolution and promotion of universal values. As a result, investment into psychological defense and ideological education of military officers and men is imperative to the PLA, as is guarding against enemy subversive activities. Defensive operations also entail internet monitoring and restricting media access.

The GPD Liaison Department

The Liaison Department is GPD’s executive agent for political warfare. The GPD Liaison Department is organized in a similar manner as other second level departments within the PLA. The department consists of multiple bureaus, which in turn consist of multiple staff divisions. On behalf of the CMC and Politburo, GPD Liaison Department exercises authority over selected dialogue platforms and international exchanges. The GPD Liaison Department leadership includes a director, between three and six deputy directors, bureau directors, and an advisory group.



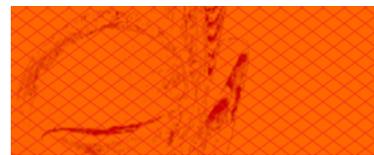


The GPD's Liaison Department functions as an interlocking directorate that operates at the nexus of politics, finance, military operations, and intelligence. The Liaison Department and its associated platforms are windows connecting elites from around the world with the CMC, and indirectly, the CCP Political Bureau Standing Committee. Its leadership engages across a complex network of personalized relationships and associations. The GPD's Liaison Department has few analogous counterparts in modern democratic societies. It often is cast as a member of China's intelligence community. Indeed, a historical review reveals the co-evolution of the CCP's political warfare and clandestine intelligence operations. However, viewing liaison work exclusively in intelligence terms diminishes its relevance to U.S. political and military leaders and counterparts around the world. The GPD Liaison Department functions as a member of China's broader political-military intelligence system. Its scope, however, appears limited to intelligence that may directly support political warfare, including the development of psychological and social profiles of elites best positioned to influence foreign and defense policies.

Leveraging specialized intelligence collection and analysis, liaison work creates and exploits divisions within an opposing leadership's defense establishment; develops and sustains rapport with foreign defense elites through exchanges; influences perceptions on the U.S.-Japan alliance and other external issues through propaganda; strategic, operational, and tactical-level psychological operations; and countering an opponent's efforts to shape perceptions within China.

GPD Liaison Department Organization

GPD Liaison Department leaders oversee at least four bureaus. Bureau directors are equal in grade to a PLA division leader, with a rank of either senior colonel (SCOL) or major general. Bureaus consist of a number of subordinate offices. Liaison work personnel may be temporarily assigned or anchored to offices within the CMC staff, PLA departments, State Council organs, and provincial or municipal-level offices. The precise designations of subordinate bureaus under the GPD Liaison Department and their scope of operations cannot be confirmed based on existing information. However, a preliminary working hypothesis is that the GPD Liaison Department is comprised of four bureaus: 1) a liaison bureau responsible for clandestine Taiwan-focused operations; 2) an investigation and research bureau responsible for international security analysis and friendly contact; 3) external propaganda bureau responsible for disintegration operations, including psychological operations, development of propaganda themes, and legal analysis; and 4) a border defense bureau responsible for managing border negotiations and agreements. Bureaus may administer non-governmental organizations (NGOs) that function as platforms for synchronizing operations with other elements within the party-state system.



External Propaganda Bureau

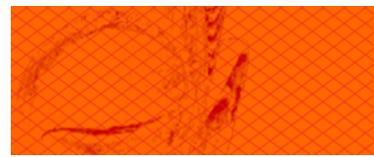
The GPD Liaison Department's External Propaganda Bureau appears to function as the PLA's principle staff directorate for applied psychological operations and propaganda. Based on guidelines released in December 2003, the GPD codified an integrated civil-military approach to political warfare that integrates psychological operations, public opinion or media warfare, and legal warfare. Referred to as the "Three Warfares", the integrated approach seeks to expand China's influence within the international community and strengthen resistance to internal and external challenges to the CCP's political authority.

Public opinion warfare directs propaganda against mass audiences in order to weaken morale and inspire ideological splits within foreign communities viewed as adversarial. Targeted groups include not only defense establishments, but also civilian diplomatic, cultural, religious, and business organizations. Seeking to counter a perceived Western monopoly on international media outlets, propaganda channels include civilian and military newspapers, magazines, television, movies, radio stations, and increasingly the internet. During crises, public opinion warfare is intended to mislead opposing military commanders into errors in judgment. Propaganda also targets domestic audiences in order to strengthen ideological determinism and promote unity between civilian and military groups. Military propaganda activities ostensibly seek to promote a positive image of the PLA both within China and among foreigners. However, defense academics who promote hard line, nationalist perspectives also support the propaganda system.

During peacetime, psychological operations identify and exploit divisions within an enemy's political establishment and deter an adversary from taking actions inimical to the CCP's interests. They also are intended to ensure that PRC policies and military operations are cast in the proper light. Psychological operations also are targeted against an adversary's value concepts. Psychological operations seek to force divisions in alliances and coalitions and reduce confidence in an enemy's economy.

Border Defense Bureau

The GPD Liaison Department's Border Defense Bureau plays a role in influencing border negotiations and agreements. China's border areas are home to ethnic minorities who, from Beijing's perspective, are a potential source of domestic and international unrest. China's has a land boundary of 22,000 kilometers with 14 states, including Russia, North Korea, India, Burma, and Vietnam. Political work appears to include the management of a system of at least 60 border meeting sites around the PRC border. Responsibilities include cross-border liaison, intelligence, propaganda, and the emergency management of border incidents.



Military Region Liaison Departments

Military Region (MR) Political Departments oversee subordinate organizations responsible for liaison work. Personnel appear to be embedded within selected provincial and municipal-level international friendly contact associations and government offices. For example:

- *Shenyang, Beijing, Lanzhou, and Jinan MR Political Department Liaison Departments* most likely focus on Russia, Central Asia, Korea, and Japan.
- *The Nanjing MR Political Department Liaison Department* most likely focuses on Taiwan, the United States, and Japan. Its platforms include the Jiangsu Association for International Friendly Contact (JAIFC) and the JAIFC Asia-Pacific Research Center. JAIFC's research center has co-hosted an annual conference on U.S. regional strategy and implications for Chinese security.
- *The Guangzhou MR Political Department Liaison Department* most likely focuses on Taiwan, the United States, and Southeast Asia. Its platforms include the Guangdong Province Association for International Friendly Contact (GAIFC) and the GAIFC Asia-Pacific Region Development Research Center.
- *The Chengdu MR Political Department Liaison Department* most likely focuses on India and the rest of South Asia, Southeast Asia, and Tibet. Its platforms include the Sichuan Association for International Friendly Contact and its South and Southeast Asia Research Center.

PLA Air Force and Navy Liaison Work

The PLAAF and presumably the PLAN Political Department directors oversee subordinate Liaison Departments. The PLAAF Political Department Liaison Department likely analyzes psychological effects of long range precision strike, among other tasks. Prominent PLAAF authorities who have emerged from the liaison work system include General Liu Yazhou, the relatively liberal-minded political commissar of the PLA National Defense University (NDU). Current 15th Airborne Corps Political Department Director Luo Yichang formerly directed the PLAAF Liaison Department.

¹ For more information see Mark Stokes and Russell Hsiao, *The People's Liberation Army General Political Department: Political Warfare with Chinese Characteristics* (Arlington, VA: Project 2049 Institute, October 2013), accessible online at http://www.project2049.net/documents/PLA_General_Political_Department_Liaison_Stokes_Hsiao.pdf.

Why the Chinese Military is Weaker (and more Dangerous) Than You Think¹

January 6, 2014



In April 2003, the Chinese Navy decided to put a large group of its best submarine talent on the same boat as part of an experiment to synergize its naval elite. The result? Within hours of leaving port, the Type 035 Ming III class submarine [sank](#) with all hands lost. Never having fully recovered from this maritime disaster, the People's Republic of China (PRC) is still the only permanent member of the United Nations Security Council [never](#) to have conducted an operational patrol with a nuclear missile submarine.

China is also the only member of the UN's "Big Five" never to have built and operated an aircraft carrier. While it launched a refurbished Ukrainian built carrier amidst much fanfare in September 2012 – then Chairman/President Hu Jintao and [all the top brass showed up](#) – soon afterward the big ship had to return to the docks for extensive overhauls because of suspected engine failure; not the most auspicious of starts for China's fledgling "blue water" navy, and not the least example of a modernizing military that has yet to master last century's technology.

Indeed, today the People's Liberation Army (PLA) still conducts [long distance maneuver training](#) at speeds measured by the standard of how fast the next available cargo train can transport its tanks and guns forward. And if mobilizing and moving armies around on railway tracks sounds a bit antiquated in an era of global airlift, it should – that was how it was done in the First World War.

Not to be outdone by the old school conventional army, China's powerful strategic rocket troops, the Second Artillery Force, still uses [cavalry units](#) for patrolling its sprawling missile bases deep within China's vast interior. Why? Because it doesn't have any helicopters. Equally scarce in China are modern fixed wing military aircraft. So the Air Force continues to use a 1950's [Soviet designed airframe](#), the Tupolev Tu-16, as a bomber (its original intended mission), a battlefield reconnaissance aircraft, an electronic warfare aircraft, a target spotting aircraft, and an aerial refueling tanker. Likewise, the PLA uses the [Soviet designed Antonov An-12](#) military cargo aircraft for

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ELINT (electronic intelligence) missions, ASW (anti-submarine warfare) missions, geological survey missions, and airborne early warning missions. It also has an An-12 variant specially modified for transporting livestock, allowing sheep and goats access to remote seasonal pastures.

But if China's lack of descent hardware is somewhat surprising given all the hype surrounding Beijing's massive military modernization program, the state of "software" (military training and readiness) is truly astounding. At one military exercise in the summer of 2012, a strategic PLA unit, stressed out by the hard work of handling warheads in an underground bunker complex, actually had to take time out of a [15 day wartime simulation](#) for movie nights and karaoke parties. In fact, by day nine of the exercise, a "cultural performance troupe" (common PLA euphemism for song and dance girls) had to be brought into the otherwise sealed facility to entertain the homesick soldiers.

Apparently becoming suspicious that men might not have the emotional fortitude to hack it in high pressure situations, an experimental all-female unit was then brought in for the 2013 iteration of the war games, [held in May](#), for an abbreviated 72 hours trial run. Unfortunately for the PLA, the results were even worse. By the end of the second day of the exercise, the hardened tunnel facility's psychological counseling office was overrun with patients, many reportedly too upset to eat and one even suffering with severe nausea because of the unpleasant conditions.

While recent years have witnessed a [tremendous Chinese propaganda effort](#) aimed at convincing the world that the PRC is a serious military player that is owed respect, outsiders often forget that China does not even have a professional military. [The PLA](#), unlike the armed forces of the United States, Japan, South Korea, Taiwan and other regional heavyweights, is by definition not a professional fighting force. Rather, it is a "party army", the armed wing of the Chinese Communist Party (CCP). Indeed, all career officers in the PLA are members of the CCP and all units at the company level and above have political officers assigned to enforce party control. Likewise, all important decisions in the PLA are made by communist party committees that are dominated by political officers, not by operators. This system assures that the interests of the party's civilian and military leaders are merged, and for this reason new Chinese soldiers entering into the PLA swear their allegiance to the CCP, not to the PRC constitution or the people of China.

This may be one reason that China's marines (or naval infantry in PLA parlance) and other amphibious warfare units train by landing on [big white sandy beaches](#) that look nothing like the west coast of Taiwan (or for that matter anyplace else they could conceivably be sent in the East China Sea or the South China Sea). It could also be why PLA Air Force pilots still typically get less than ten hours of flight time a month (well

below regional standards), and only in 2012 began to have the ability to submit their own flight plans (previously, overbearing staff officers assigned pilots their flight plans and would not even allow them to taxi and take-off on the runways by themselves).

Intense and realistic training is dangerous business, and the American maxim that the more you bleed during training the less you bleed during combat, doesn't translate well in a Leninist military system. Just the opposite. [China's military](#) is intentionally organized to bureaucratically enforce risk adverse behavior, because an army that spends too much time training is an army that is not engaging in enough political indoctrination. [Beijing's worst nightmare](#) is that the PLA could one day forget that its number one mission is protecting the communist party's civilian leaders against all its enemies—especially when the CCP's “enemies” are domestic student or religious groups campaigning for democratic rights, as happened in [1989](#) and [1999](#), respectively.

For that reason, the PLA has to engage in constant “[political work](#)” at the expense of training for combat. This means that 30 to 40 percent of an officer's career (or roughly 15 hours per 40-hour work week) is wasted studying CCP propaganda, singing patriotic songs, and conducting small group discussions on Marxist-Leninist theory. And when PLA officers do train, it is almost always a cautious affair that rarely involves risky (i.e. realistic) training scenarios.

President Lincoln once observed that if he had six hours to chop down a tree he would spend the first four hours sharpening his axe. Clearly the PLA is not sharpening its proverbial axe. Nor can it. Rather, it has opted to invest in a bigger axe, albeit one that is still dull, and more propaganda. Ironically, this undermines Beijing's own [aspirations](#) for building a truly powerful 21st Century military.

Yet none of this should be comforting to China's potential military adversaries. It is precisely China's military weakness that makes it so dangerous. Take the PLA's lack of combat experience for example. A few minor border scraps aside, the PLA hasn't seen real combat since the Korean War. This appears to be a major factor leading it to act so brazenly in the East and South China Seas. Indeed, China's navy now appears to be itching for a fight anywhere it can find one. Experienced combat veterans almost never act this way. Indeed, history shows that military commanders that have gone to war are significantly less hawkish than their inexperienced counterparts. Lacking the somber wisdom that comes from combat experience, today's PLA is all hawk and no dove.

The Chinese military is dangerous in another way as well. Recognizing that it will never be able to compete with the U.S. and its allies using traditional methods of war fighting, the PLA has turned to unconventional “asymmetric” first-strike weapons and capabilities to make up for its lack of conventional firepower, professionalism and experience. These weapons include over [1,600 offensive ballistic and cruise missiles](#)

whose very nature is so strategically destabilizing that the U.S. and Russia decided to outlaw them with the [INF Treaty](#) some 25 years ago.

In concert with its strategic missile forces, China has also developed a broad array of [space weapons](#) designed to destroy satellites used to verify arms control treaties, provide military communications, and warn of enemy attacks. China has also built the world's largest [army of cyber warriors](#), and the planet's second largest [fleet of drones](#), to exploit areas where the U.S. and its allies are under-defended. All of these capabilities make it more likely that China could one day be tempted to start a war, and none come with any built in escalation control.

Yet while there is ample and growing evidence to suggest China could, through malice or mistake, start a devastating war in the Pacific, it is highly improbable that the PLA's strategy could actually win a war. Take a Taiwan invasion scenario, which is the PLA's top operational planning priority. While much [hand-wringing](#) has been done in recent years about the shifting military balance in the Taiwan Strait, so far no one has been able to explain how any invading PLA force would be able to cross over 100 nautical miles of exceedingly rough water and successfully land on the world's most inhospitable beaches, let alone capture the capital and pacify the rest of the rugged island.

The PLA simply does not have enough transport ships to make the crossing, and those it does have are remarkably vulnerable to Taiwanese [anti-ship cruise missiles](#), [guided rockets](#), [smart cluster munitions](#), mobile artillery and advanced sea mines – not to mention its elite corps of [American-trained](#) fighter and helicopter pilots. Even if some lucky PLA units could survive the trip (not at all a safe assumption), they would be rapidly overwhelmed by a small but professional Taiwan military that has been thinking about and preparing for this fight for decades.

Going forward it will be important for the U.S. and its allies to recognize that China's military is in many ways [much weaker than it looks](#). However, it is also growing more capable of inflicting destruction on its enemies through the use of first strike weapons. To mitigate the destabilizing effects of the PLA's strategy, the U.S. and its allies should try harder to maintain their current [\(if eroding\)](#) leads in military hardware. But more importantly, they must continue investing in the training that makes them true professionals. While manpower numbers are likely to come down in the years ahead due to defense budget cuts, regional democracies will have less to fear from China's weak but dangerous military if their axes stay sharp.

ASSESSING JAPAN'S NATIONAL DEFENSE:

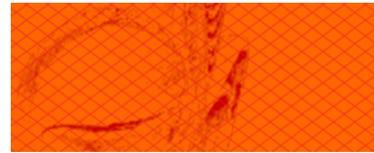
TOWARD A NEW SECURITY PARADIGM IN THE ASIA-PACIFIC



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June 3, 2013



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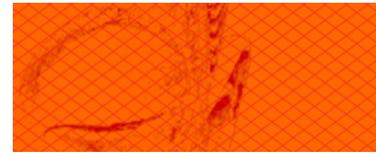
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****The authors would like to acknowledge and thank the Sasakawa Peace Foundation (SPF) for its generous support of this project. We are especially thankful for the guidance and assistance provided by Kazuyo Kato. In addition, we would like to thank the executive director of SPF, Junko Chano, for her hospitality and support during our research trips to Japan.*

About the Project 2049 Institute

The Project 2049 Institute seeks to guide decision makers toward a more secure Asia by the century's mid-point. The organization fills a gap in the public policy realm through forward-looking, region-specific research on alternative security and policy solutions. Its interdisciplinary approach draws on rigorous analysis of socioeconomic, governance, military, environmental, technological and political trends, and input from key players in the region, with an eye toward educating the public and informing policy debate.

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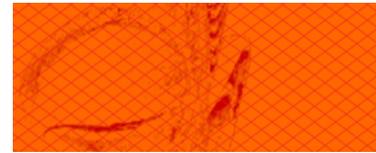
Introduction

Profound strategic changes are unfolding that have the potential to transform the fabric of the international system. It is unknown whether or not the positive forces of globalization and democracy or the darker forces of mercantilism and authoritarianism will ultimately prevail. What is known is that the struggle between these forces will take foremost place in the Asia-Pacific region, the new epicenter of global affairs. As one of the region's most prosperous and powerful – and pivotally located – countries, Japan will play a major role in steering the trajectory of future developments in the Asia-Pacific.

The impact that Japan will have on the strategic architecture that frames and defines the region in the years ahead cannot be overstated. Decisions made in Tokyo will ripple into policymaking calculations across the region, and indeed the world. How Japan conceptualizes its place in the nascent U.S. rebalance to Asia more broadly, and how it perceives its role in the Air-Sea Battle concept of operations more specifically, will influence and shape much. More important may prove to be the extent to which Japanese leaders are able to implement changes to their national defense guidelines (currently under review) and find freedom from the self-imposed political constraints currently in place under Article Nine of Japan's Constitution.

Constitutional constraints notwithstanding, trends in the regional security environment are likely to drive Tokyo's defense planning, compelling decisions regarding roles and missions that will in turn alter the course of capacity development. Foremost among its security challenges, the People's Republic of China's (PRC) military modernization program is attended by uncertainties and risks for neighboring Japan. These uncertainties and risks have increased at a remarkable pace over the past ten years as China's military build-up continues to surpass expectations and Beijing's assertiveness over disputed territories grows. Likewise, North Korean behavior remains unstable and provocative, while its nuclear weapons and ballistic missiles programs mature. The threats posed by both nations, as measured in capabilities and intentions, have catalyzed reconsiderations of Japan's defense posture. The threats of Russian incursion, international terrorism, pandemic, and natural disaster remain relevant for Japan, but now represent more distant second order problems for the nation's security in light of the challenges posed by China and North Korea.

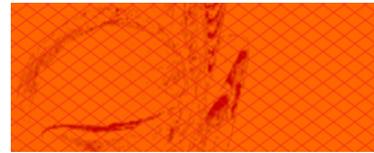
The most important aspect of Japan's national security strategy is its defensive alliance with the United States. Since the end of the Second World War, the U.S. security commitment to Japan has served as an anchor stabilizing the region and enabling growth. The stunning political and economic transformation of post-war Japan created



the world's second most prosperous country after the United States and – importantly – a model for other aspiring regional powers to follow. Arguably, democracy and prosperity would not have flourished in South Korea and Taiwan in the absence of the U.S.-Japan alliance; Australia, Singapore and Hong Kong would not enjoy their current standards of living; and China would not be an emerging superpower. In ways large and small the U.S.-Japan alliance has served as a pillar supporting the dramatic rise of the Asia-Pacific on the world stage.

Yet there have been times when policymakers in Washington and Tokyo disregarded the central importance of their alliance. The fall of the Soviet Union and the end of the Cold War led to a gradual drift in the U.S.-Japan relationship. This drift saw something of a course correction following by the 9-11 terrorist attacks, as Japan strongly supported the ensuing U.S. invasions of Afghanistan and Iraq, and anti-piracy operations off the coast of East Africa. However, the alliance was also beset by basing relocation issues, the global financial recession, and a season of political contrarianism in Tokyo. The successful joint humanitarian assistance and disaster relief mission following the Great East Japan Earthquake in March 2011 served to “buy time” for the alliance, but it wasn't until the U.S. began to redefine and refocus its role in the region that new life was injected into the U.S.-Japan relationship. Further improving prospects for a stronger U.S.-Japan alliance, the Abe administration has begun pursuing deeper defense ties with Washington while expanding Tokyo's domestic contributions to regional security.

This monograph will explore Japan's role in the evolving U.S.-led defense architecture that is likely to define the Asia-Pacific in the years ahead. To begin, we will describe the major trends and capabilities that will factor into the regional security environment and challenge Japanese defense planners. Next, we will review the Japanese Self Defense Force's (JSDF) evolving capabilities and posture. Following this we will assess ways in which Japan could participate in – and enable – both the U.S. rebalance to Asia and the U.S. military's Air-Sea Battle concept of operations. We will then conclude with recommendations for Tokyo, recommendations for Washington, and recommendations for the U.S.-Japan alliance.

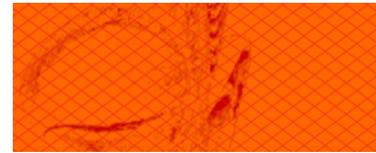


Trends and Growing Adversary Capabilities

The manner in which Japan's regional security environment evolves over the coming years will be contingent upon broader trends that may already be discernible. One such trend is the rapid proliferation of technologies that can undermine the ability of modern militaries – such as those fielded by Japan and its ally the United States – to maintain regional dominance. Driven by advances in integrated circuit technologies that allow for exponentially more powerful chip performance, modern conventional weapons systems are capable of strategic effects that until recently could only be achieved through the use of nuclear weapons. This has had a flattening effect on power asymmetries, allowing relatively weak states to threaten more powerful adversaries with weapons that cost a mere fraction of the cutting-edge platforms they seek to counter. At the low end of the spectrum, Hezbollah in its 2006 war with Israel showed the world how a small force could defeat an otherwise overwhelming opponent through the application of tactics that optimize the employment of guided rockets, artillery, mortars and missiles (G-RAMM). At the high end of the spectrum, China is developing advanced ballistic and cruise missiles, anti-satellite weapons, submarines, cyber warfare capabilities, and unmanned aerial systems that have the potential to rapidly erode America's preponderance in the Western Pacific.

Broadly speaking, the global commons of international water, air, space and cyberspace that were once the sole purview of superpowers are increasingly congested and contested by a multitude of actors. This situation creates new challenges for the defense of Japan while also promising significant advantages that may reduce some past vulnerabilities. For example, as an island nation that is highly dependent upon seaborne trade and energy supplies, Japan is justifiably concerned about China's growing maritime threats to its shipping fleet. On the other hand, given the development of technology-enabled shore defense systems, Japan may be in a position to radically undercut concerns about the potential for a successful amphibious invasion against its islands. However, despite some positive aspects to these trends, Japanese defense planners describe their overall security situation as one in decline. According to then-Japanese Defense Minister, Satoshi Morimoto, "the security environment surrounding [Japan] is becoming increasingly harsh."¹

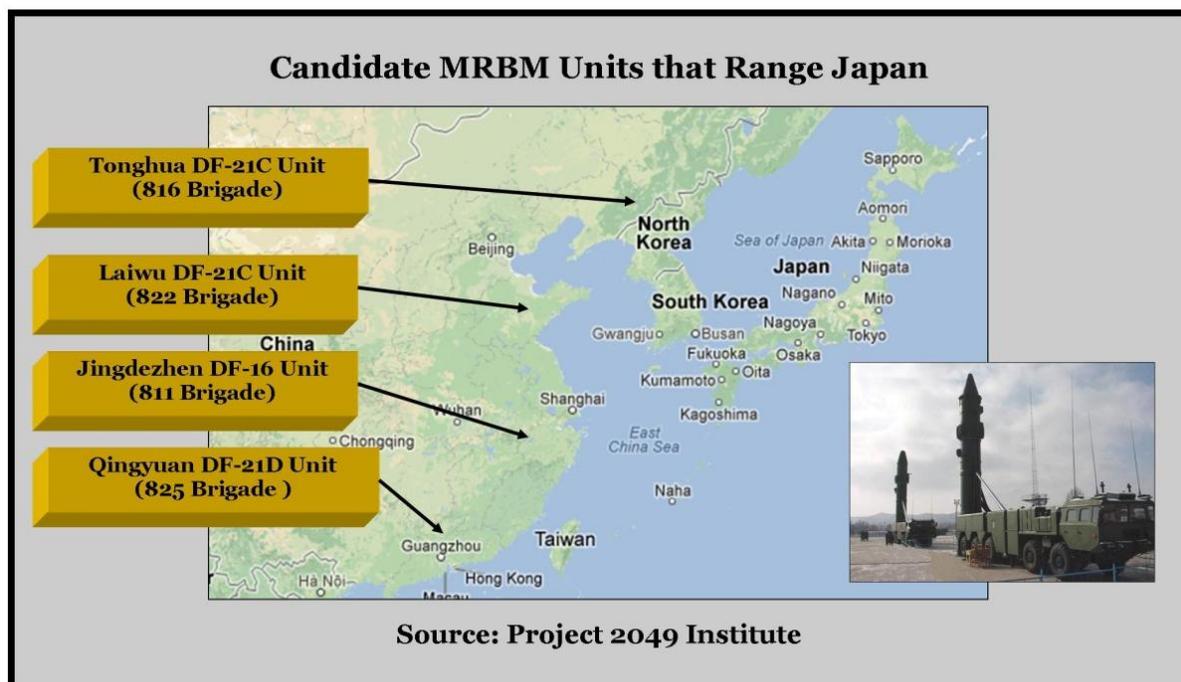
What follows is an overview of weapons technology proliferation trends that are negatively impacting upon Japan's security. These trends are worrisome because they increasingly allow countries such as China and – to a much lesser degree – North Korea to expose critical vulnerabilities in Japan's defense posture, while at the same time eroding the dominance of Japan's ally the United States. Because the entire territory of

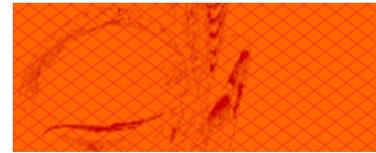


Japan is within the “threat envelope” of many of the adversary weapons being fielded, and because there is no reliable defense against these weapons, there is a concern that they could serve to undermine or at the very least complicate the U.S.-Japan alliance. Also of concern is the destabilizing nature of the weapons themselves. Many of the weapons being deployed are primed for offensive first strikes. They therefore encourage rapid horizontal and vertical escalatory responses in times of conflict. As such, their deployment represents a nettlesome problem for the long-term maintenance of regional stability.

Ballistic missiles.² The Chinese People’s Liberation Army’s (PLA) Second Artillery Force fields the world’s largest and most capable inventory of conventionally armed ballistic missiles. In recent years, the Second Artillery has deployed an increasing number of conventional ballistic missiles that have sufficient ranges to target Japanese territory. These missiles are all solid-fueled and road mobile, making it difficult for a defender to predict when and where they will be launched. Further advancing their lethality, significant investments have been made into improving warhead accuracies and payloads while also developing methods to defeat ballistic missile defenses such as Patriot-3 (PAC-3) and Standard Missile-3 (SM-3) missile interception systems fielded by the JSDF.

Initially, the only conventional ballistic missile in the PLA arsenal that could reach Japan was the medium-range *Dongfeng-21C* (DF-21C).³ However, the Second Artillery Force has also begun deploying a new medium-range ballistic missile (MRBM), the DF-16, which is reportedly aimed at “counter-intervention” missions.⁴ According to this assessment, the DF-16 would be primarily intended for targeting U.S. air and naval bases in Japan during a confrontation over Taiwan. Of even greater concern, the Second Artillery began deploying an anti-ship ballistic missile (ASBM), the DF-21D, in 2010.⁵



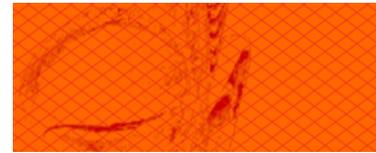


The purpose of the DF-21D is to threaten U.S. carrier strike groups operating in the Western Pacific. In theory, it could also pose a threat to Japan's helicopter carriers.

North Korea has developed two MRBMs with ranges that suggest that their primary target is Japan.⁶ The *Nodong* is a road mobile MRBM that has been deployed in active service since the mid-1990s. As of 2006, it was estimated that North Korea had produced approximately 200 operational *Nodong* missiles.⁷ North Korea has also been developing the *Taepodong-1* MRBM for Japan-related missions, although recent reports suggest that this missile may be intended as a transitory program for the development of the longer-ranged *Taepodong-2* intercontinental ballistic missile (ICBM).⁸ While both the *Nodong* and the *Taepodong-1* could strike targets across Japan, their lack of advanced guidance make them weapons of terror rather than precision-strike weapons that could reliably target military facilities. For this reason, it appears likely that North Korea would use them as delivery platforms for nuclear, biological or chemical weapons, rather than conventional warheads.⁹ Unlike comparable Chinese systems, the *Nodong* and *Taepodong* MRBMs are both liquid-fueled.¹⁰ In further contrast with China, it does not appear that North Korea has developed methods to defeat ballistic missile defense systems.

Cruise missiles.¹¹ After decades of sustained investments in advanced cruise missile procurement, the PLA currently fields some of the world's most cutting-edge cruise missile systems. China has produced large numbers of advanced ground-launched cruise missiles that are capable of standoff precision strikes. Having previously obtained a large number of cruise missiles from Russia, the PLA in recent years has been acquiring considerable numbers of domestically built systems. These include the Second Artillery Force's indigenous, ground-launched *Changjian-10* "Long Sword" (CJ-10) land attack cruise missiles (LACM); the PLA Navy's ground- and ship-launched *Yingji-62* "Eagle Strike" (YJ-62) anti-ship cruise missile (ASCM); and the PLA Air Force's *Yingji-63* (YJ-63) LACM.¹² The PLA Navy also deploys the Russian-built SS-N-22 "Sunburn" supersonic ASCM on its Sovremenny-class destroyers, and the Russian SS-N-27B "Sizzler" supersonic ASCM on eight of its 12 Kilo-class diesel-attack submarines. In sum, the PLA Navy has or is in the process of acquiring over ten ASCM variants, including the next generation CH-SS-NX-13 ASCM indigenous design.¹³

With an estimated 200-500 missiles deployed on 40-55 road-mobile, tri-canister launchers in the Second Artillery Force, China's strategic CJ-10 LACM may be of particular concern to Japanese defense planners. It is reported to have a stealthy design and a range of over 1,500km, giving the PLA the ability to place the entirety of Japan within the threat envelope of its cruise missiles.¹⁴ Likewise, the PLA Navy operates 100 JH-7 land based fighter-bombers and an unknown number of H-6 maritime bombers



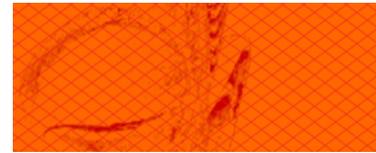
that are armed with ASCMs.¹⁵ According to the Department of Defense, these could have a strike radius of over 1,500km.¹⁶ For its part, the PLA Air Force operates an unknown number of H-6 bombers equipped with LACMs that have maximum strike ranges out to Guam.¹⁷

At both the tactical and strategic levels, China's advanced cruise missiles have serious implications for regional security in the Western Pacific and beyond. Like China's highly-successful ballistic missile systems, cruise missiles are technologically challenging (and expensive) to defend against. However, unlike ballistic missiles, cruise missiles are able to strike from any direction and fly at very low altitudes, making them even harder to detect and counter. Cruise missiles are also more accurate and inexpensive to build than ballistic missiles and, because of their relatively small size, can be launched from a variety of platforms, further adding to their stealth and agility. Like ballistic missiles, they also represent a major proliferation risk.¹⁸ Indeed, while details remain murky, it has been reported that cruise missiles China sold to Iran were later acquired by North Korea.¹⁹



Submarines.²⁰ The PLA Navy has the world's largest fleet of diesel electric submarines, and a small but growing nuclear-powered attack submarine force, giving it a strong anti-surface warfare capability. With some 40 modern attack submarines currently fielded and up to 70 expected to be in service by the end of the decade, the PLA Navy's submarine force is designed to assist in efforts to achieve sea superiority around the first island chain, to include countering U.S. and Japanese intervention in a Taiwan conflict. The current mainstay of the PLA Navy submarine force is its 13 Song-class (Type-039) boats, and its growing force of next-generation Yuan-class (Type-041) submarines. Both the Song-class and Yuan-class are capable of carrying ASCMs, and the newer Yuan-class boats are probably equipped with air-independent propulsion (AIP) systems, greatly extending their submerged patrol ranges.

The PLA Navy fields nuclear-powered attack submarines (SSN) for a variety of long-range missions, including surveillance and surface interdiction missions carried out with ASCMs and torpedoes. It currently has two second-generation Shang-class (Type-

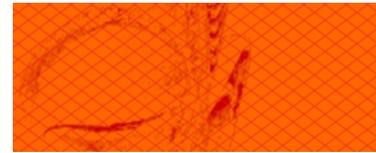


093) submarines in service and may add up to five third-generation Type-095 SSNs in the coming years. The PLA Navy's SSNs may be capable of launching LACMs. The Song, Yuan, Shang and new Type-095 SSN are expected to be eventually capable of launching the next generation CH-SS-NX-13 ASCM.²¹ The PLA Navy also operates eight upgraded Kilo-class submarines that are notable for their stealth and ability to launch advanced, Russian-made ASCMs. China intends to purchase four Lada-class submarines from Russia in the coming years. These would represent an improved variant of the PLA-Navy's already highly capable Kilo-class submarines, and be equipped with AIP.²²

The PLA Navy operates a number of obsolete Ming-class (Type-035) submarines that are much less capable than the aforementioned newer-design submarines. The continued deployment of the Ming-class submarines suggests that the PLA Navy views them as still having value as minelayers or decoys that can be used to distract or draw out enemy submarines. All of China's submarines are capable of launching one or more of the following: torpedoes (wire-guided or wake-homing), mines, and ASCMs. Wake-homing torpedoes, like ASCMs, are of concern because they can be very difficult to counter. China has also modernized its large inventory of mines; with estimates exceeding 50,000 mines in the PLA Navy inventory. It appears that China is also developing unmanned underwater vehicles.²³

The North Korean Navy has approximately 20 Romeo-class submarines and 60 midget submarines. While its submarines are outdated, they could still pose a challenge in coastal areas. An example of this can be seen in the March 26, 2010 sinking of the ROK naval patrol ship *Cheonan*. A joint military-civilian survey group found that a small North Korean Navy submarine sunk the *Cheonan* with a torpedo.²⁴ Of concern to Japan, North Korea could also use its submarines to infiltrate special operations forces into coastal areas for sabotage, abduction, guerilla warfare and intelligence gathering missions.²⁵

Anti-satellite weapons. Along with missiles and submarines, counter space weapons capabilities are viewed as key elements of China's military modernization and regional strike programs. The PLA has been developing a multifaceted program to degrade or deny adversaries the use of satellites in times of crisis or conflict since at least the early 1990s. This program has included repeated testing of direct-ascent anti-satellite (ASAT) weapons, space-based co-orbital weapons, and high-powered ground-based lasers. The PLA has also developed counter space capabilities that include jamming, microwave and cyber weapons.²⁶ The PLA sees a significant advantage in having the capabilities to engage in space warfare. At the strategic level, PLA planners and strategists view ASATs as critical elements of a space deterrent that can help maintain the coercive leverage of China's nuclear and conventional weapons in the face of U.S.-led regional missile



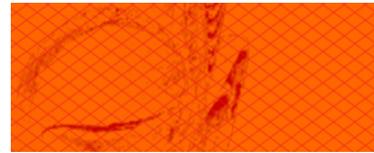
defense programs.²⁷ China's continued acquisition of ASAT weapons is attended with a great deal of opacity, making estimates regarding specific capability deployments difficult. However, given China's aggressive testing regime and its across-the-board advancements in space technology, a cautious assumption would posit that the PLA has or will soon have the ability to hold Japan's growing force of military satellites at risk across the orbital spectrum.

Cyber warfare capabilities. China's military cyber espionage and cyber warfare capabilities represent what is commonly referred to as an advanced persistent threat. Unlike in other realms of warfare, where gaining intelligence, surveillance and reconnaissance information on the location and disposition of an enemy force is a much easier task than actually executing strikes on that force, in the cyber domain the ability to penetrate defenses in order to prepare the battlefield directly enables attacks. Once computer networks have been penetrated, the aggressor can launch light-speed offensive actions at a time of his choosing and expect vanishingly small levels of resistance.²⁸

The PLA's unparalleled cyber espionage campaign, notable for penetrating sensitive networks around the globe, including those of Japan, should be considered a threat that is at least on par with its development of missile, submarine and space warfare capabilities. The PLA General Staff Department's (GSD) Third Department, China's executive authority for signals intelligence (SIGINT) and cyber warfare, has a large unit that focuses on Japan and Korea. This unit is the GSD Third Department Fourth Bureau (91419 Unit), headquartered in Qingdao.²⁹ While individual missions are not entirely clear, the 91419 Unit has subordinate offices located in Shanghai, Beijing, Dalian, Hangzhou, and Xinzhou that could target Japanese computer networks and other electronic systems.³⁰

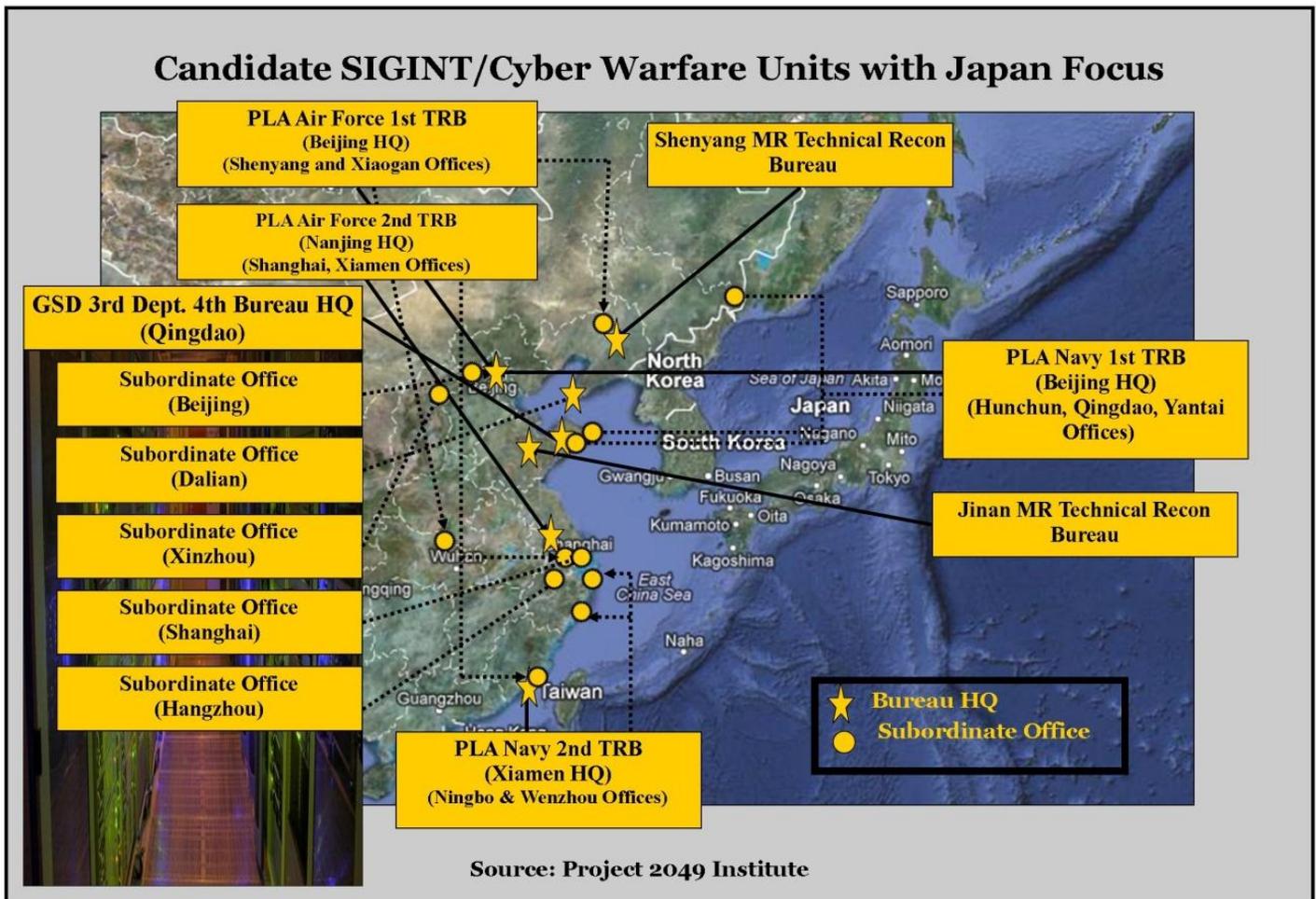
The PLA also has at least two Technical Reconnaissance Bureaus (TRB) that focus on Japanese and Korean targets. These TRBs would have the primary mission of supporting their respective Military Region (MR) command with SIGINT and cyber warfare capabilities. They would also likely follow policy guidance and general tasking for collection, translation, analysis and reporting issued by the GSD Third Department headquarters in Beijing. The Jinan MR TRB (72959 Unit) is located in Jinan City, and the Shenyang MR (65016) TRB is located in Shenyang's Dongling District. Both oversee at least one office that would focus on Japanese targets.³¹

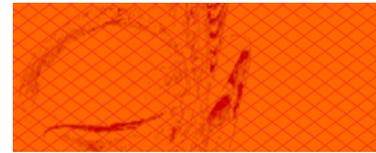
The PLA Air Force First TRB (95830 Unit) in Beijing may also support cyber operations with a Japan focus, although its primary mission is likely to be providing national air defense. The PLA Air Force First TRB oversees elements in Shenyang and Xiaogan. Likewise, the PLA Air Force Second TRB in Nanjing would notionally support missions targeting Japan as well. Specific offices may be based in Shanghai, and Xiamen.³²



The PLA Navy's First TRB in Beijing may also support cyber operations with a Japan focus, although its primary missions would be to provide maritime domain awareness, electronic warfare and electronic intelligence (ELINT) collection capabilities. The PLA Navy First TRB operates offices in Hunchun, Qingdao and Yantai that could support missions targeting Japan. The PLA Navy's Second TRB in Xiamen oversees offices in Ningbo and Wenzhou that may have a Japan focus.³³

The PLA's GSD Forth Department, China's executive authority for radar and radar countermeasures may also have a cyber warfare mission. Unlike the GSD Third Department, which conducts strategic operations, the GSD Forth Department's cyber warriors would most likely focus on achieving tactical level effects, to include jamming or destroying enemy computer networks supporting battlefield ISR.³⁴ It is possible that this would include computers or other electronic systems on enemy communications and early warning satellites in low-inclination, equatorial orbits.³⁵

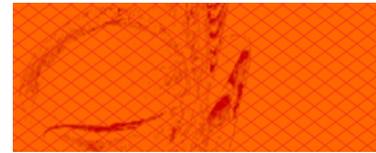




Unmanned Aerial Vehicles. China's development of large numbers of unmanned aerial vehicles (UAV) for military missions extending into the Western Pacific represents an emerging threat to Japan's defense. The PLA has developed an extensive UAV infrastructure over the past decade. This program includes a growing number of operational UAV units under the PLA Air Force, the PLA Navy, the PLA Second Artillery Force and PLA ground forces. China's UAV programs appear to be focused on meeting the primary mission types of ISR, precision strike, electronic warfare and data relay.³⁶ In the near term, the PLA's UAVs could play key role in monitoring China's disputed maritime claims, including the Senkaku Islands. This could put Japan at a distinct disadvantage, especially if the JSDF lacks its own sophisticated aerial reconnaissance and surveillance capabilities to match the Chinese in terms of maritime domain awareness.

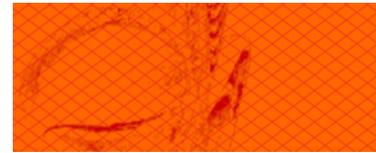
According to Chinese officials, China plans to construct 11 UAV bases along its coastline by 2015 for maritime monitoring missions. As part of this program, the State Oceanic Administration (SOA) completed a trial program in 2011 that used UAVs in Liaoning Province to take aerial imagery of 980 square miles of sea area.³⁷ Because SOA is an organization that appears to sometimes serve as a proxy to the PLA Navy, these maritime reconnaissance capabilities represent dual use capabilities that, while ostensibly civilian in nature, would be called to military service in wartime.³⁸ According to reports, the PLA has already deployed UAVs for missions over the East China Sea, notably to an air base near Shuimen, Fujian.³⁹ Other UAV units in China are reportedly stationed in the Guangzhou MR and the Beijing MR, in Meizhou and Tongzhou, respectively.⁴⁰ Authoritative estimates state that the PLA Air Force alone had over 280 UAVs in service by early 2011.⁴¹ According to a retired Deputy Chief of the PLA General Staff Department, China is likely to field over 1000 UAVs in the near future.⁴²

Looking farther ahead, Chinese UAVs will support the expansion of the PLA's operational envelope, pushing its reconnaissance strike complex farther out into the Western Pacific. Chinese sources note that UAVs provide the ability to engage in high altitude long endurance patrols unmatched by manned missions whose flight times are restricted by the limits of human endurance. A robust network of ISR mission capable UAVs, combined with satellites and "tattletale" ships will make it increasingly likely that the PLA will be able to locate enemy fleets at greater distances, and, once discovered, track them continuously.⁴³



This should be of particular concern to the Japanese Maritime Self Defense Force and the U.S. Navy because according to Chinese military-technical materials, PLA operational thinkers and scientists envision attacking U.S. aircraft carrier battle groups with swarms of multi-mission UAVs in the event of conflict.⁴⁴ While Chinese sources indicate significantly less interest in planning to use UAVs in support of amphibious island landing operations or operations against land-based targets, it seems logical that the PLA could use the same weapons and tactics to enhance operational capabilities beyond the anti-ship mission. This would suggest that the PLA's expanding UAV capabilities could complicate American and Japanese operational planning across the Western Pacific battle space, ultimately impacting upon equities in all service branches.⁴⁵





Japan's Evolving Capabilities and Defense Posture

Compelled by emerging Chinese and North Korean threats in its security environment, Japan released a new National Defense Program Guidelines (NDPG) in late 2010 that called for the development of a “Dynamic Defense Force.” This concept focuses on improving JSDF readiness, mobility, flexibility, and sustainability while developing advanced military technology and intelligence capabilities.⁴⁶ With regards to the role of the JSDF, the 2010 NDPG states that priorities are placed on:

- 1) Protecting the sea and airspace around Japan;
- 2) Responding to attacks on offshore islands;
- 3) Responding to cyber attacks;
- 4) Responding to guerilla and special force attacks;
- 5) Responding to ballistic missile attacks;
- 6) Responding to “complex contingencies”; and
- 7) Responding to large scale disasters and/or the use of weapons of mass destruction.⁴⁷

Specifically, the 2010 NDPG calls for adjusting the heretofore Cold War-era posture of the JSDF by drawing down equipment that is less-relevant to the current security environment, such as tanks and artillery, while redistributing units geographically from the North (Hokkaido) to the West (Kyushu) and Southwest (the Ryukyus).⁴⁸ It prioritizes joint operations, off-shore island defense, operational support (logistics, military medicine and engineering), and intelligence capabilities.⁴⁹ In practice, this has resulted in an increased emphasis on a defense capacity building effort that was already underway. At the strategic level, there has been a focus on ensuring information superiority through continuous ISR activities. In particular, Japan has developed a military space program, deployed an integrated land- and sea-based ballistic missile defense network, and significantly strengthened its intelligence collection infrastructure.

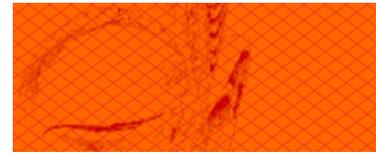
Japan's Military Space Force

Japan began its military space program in response to North Korea's test firing of a *Taepodong-1* ballistic missile over Japanese territory in 1998. Beginning with a reconnaissance satellite program, the JSDF has steadily expanded its utilization of the space domain over the past decade. Japan has developed and launched two series of advanced imagery satellites, including at least four electro-optical (EO) satellites for imaging targets visible in daylight, and three or four synthetic aperture radar (SAR)

JAPAN'S NATIONAL DEFENSE GUIDELINES

- . **Established 1976**
- . **Revised 1995, 2004 and 2010**
- . **Currently under review**
- . **Sets basic defense policies and future guidelines on the role and organization of JSDF**
- . **Targets levels of major equipment to be acquired**

Source: *Defense of Japan 2012*



satellites capable of imaging targets obscured by clouds or cloaked in the dark of night.⁵⁰ The Japanese Ministry of Defense (MoD) also purchases and analyzes high resolution commercial satellite imagery as part of its intelligence collection activities.⁵¹

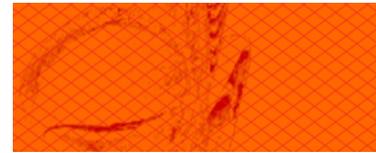
The Japanese MoD and JSDF have two communications satellites – Superbird-B2 and Superbird-D – that they use to share intelligence and exercise command and control over naval vessels and aircraft, ground units responding to disasters, and forces deployed overseas. These satellites will be replaced by an X-band communications satellite system around 2015 that will be more resistant to jamming.⁵² Japan has also been developing a “Quasi-Zenith” navigation satellite constellation to improve the accuracy and availability of GPS signals in mountainous and urban areas. It launched its first Quasi-Zenith satellite in 2010, and plans to launch three more satellites in the series before 2018.⁵³

Japan's military space program is supported by the “Kodama” Data-Relay and Tracking Satellite (DRTS), which allows for the real-time transmission of data from satellites in low earth orbits not otherwise within view of ground stations.⁵⁴ Looking ahead, Japan is considering upgrading its military space fleet with an infrared early warning satellite for detecting ballistic missile launches, communications intelligence (COMINT) collection satellites, and electronic intelligence (ELINT) satellite constellations for ocean surveillance.⁵⁵

Japan's Ballistic Missile Defense Force

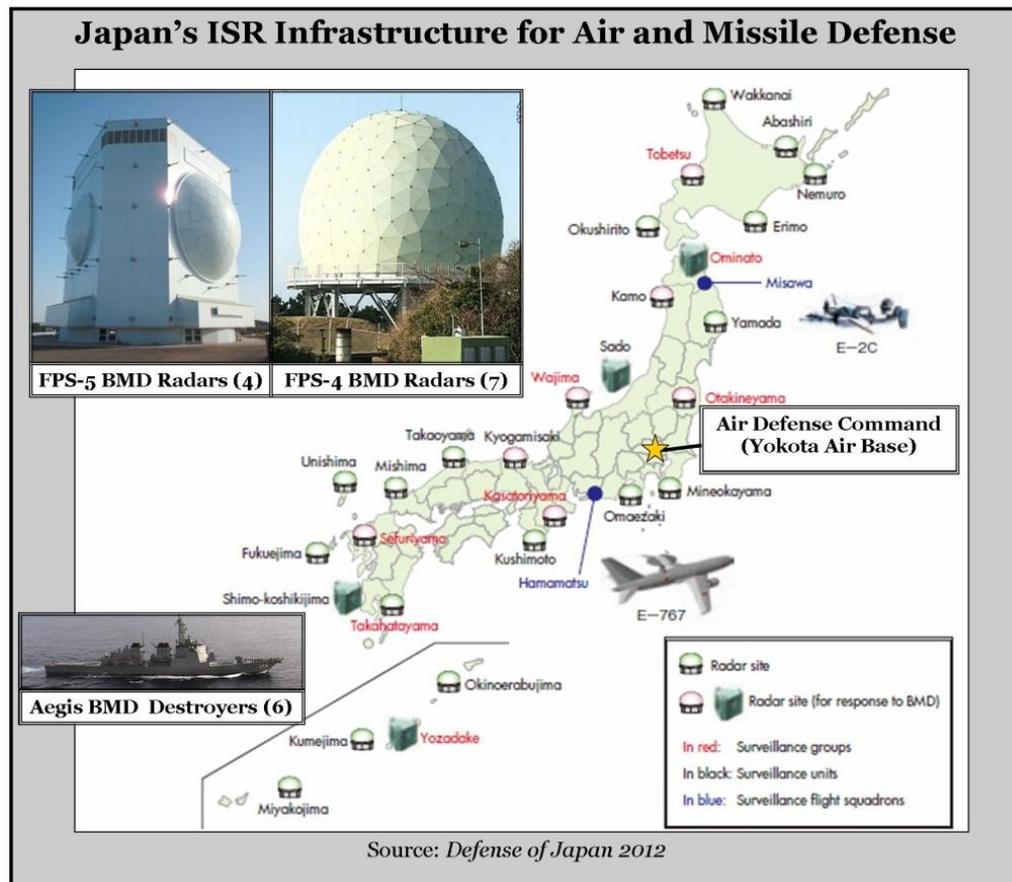
Like its military space program, Japan's missile defense efforts began in response to North Korea's 1998 ballistic missiles test. In recent years, the Japanese MoD has evinced a steadily increasing sense of urgency with regards to its Ballistic Missile Defense (BMD) program as potential Chinese missile threats to Japan have advanced. According to one Japanese MoD report, “in the event of an armed attack on Japan, such attacks are...likely to begin with surprise air attacks using aircraft or missiles.⁵⁶ As such, Japan has been taking a number of steps to improve its air and missile defense posture that include: upgrading its air defense radars, centralizing its air defense command headquarters, integrating itself into the regional U.S. BMD architecture and deploying new missile interceptors.

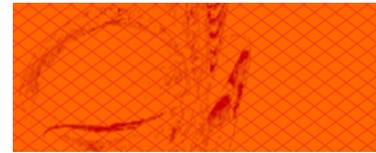
Japan's Air Self Defense Force (JASDF) maintains 28 ground-based, air defense radar sites.⁵⁷ Of these, four FPS-5 next generation missile defense radars and seven improved FPS-3 radars (FPS-4) are BMD capable. Japan's first FPS-5 radar was deployed on Shimo-koshiki island on May 2009, with follow-on radar sites at Ominato, Sado and Yozadake (Okinawa) completed by 2011.⁵⁸ Seven FPS-3 radar sites at have been



upgraded to FPS-4 systems.⁵⁹ These radar sites and their associated air defense units are organized into air defense missile groups, which are grouped geographically with their associated air wings into four air defense forces, each of which maintains one advanced FPS-5 missile defense radar site. These four air and missile defense forces are unified at Japan's Air Defense Command (ADC) headquarters, which completed its move from Fuchu Air Station to Yokota Air Base in March 2012.⁶⁰

In a move strengthening the U.S.-Japanese missile defense partnership, all elements of Japan's air defense network are now unified at Japan's ADC headquarters at Yokota Air Base. About 1,200 Japanese personnel transferred to the new ADC headquarters building which serves as the supreme command authority for Japanese air and ballistic missile defense.⁶¹ The location helps facilitate cooperation between U.S. and Japanese forces as the new bilateral air operations center links up with the 613th Air and Space Operations Center (AOC) at Hickham Air Force Base in Hawaii which synchronizes all U.S. air, space and cyberspace missions in the Asia-Pacific region.⁶² Importantly, this gives Japan direct access to data from U.S. early-warning satellites and other BMD sensors.⁶³ The JASDF ADC complex is physically linked by a tunnel to a basement control hub under the headquarters of the U.S. Force Japan (USFJ) headquarters building. The Bilateral Joint Operations Coordination Command Center (BJOCC) under the USFJ headquarters building can hold up to 150 personnel during wartime scenarios, with every position on the main floor having Japanese and U.S. counterparts working alongside each other to augment bilateral operability.⁶⁴





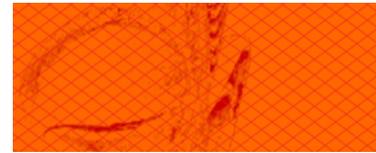
Japan has been actively integrating itself into the U.S. BMD shield in other ways, including the acquisition of U.S.-made missile defense interceptor systems and the co-development of next generation BMD capabilities. By the end of 2010, Japan had equipped four of its Aegis destroyers with SM-3 interceptors for upper tier BMD. By the end of 2010 Japan had also deployed Patriot Advanced Capability-3 (PAC-3) interceptors to some fire units.⁶⁵ Japan's MoD links its four BMD-capable Aegis destroyers and 17 Patriot (PAC-2/PAC-3) fire units to its FPS-5 radar sites and upgraded FPS-4 radar sites via a network known as the Japan Aerospace Defense Ground Environment (JADGE).⁶⁶ Eventually, Japan plans to have six to eight of its Aegis destroyers equipped with SM-3 missiles.⁶⁷ Looking ahead, Japanese destroyers will eventually be armed with an advanced interceptor missile (the SM-3 Block IIA) that Japan is jointly developing with the U.S. government and defense industry.⁶⁸

Japan's Signals Intelligence infrastructure

Japan's 2012 defense white paper highlights the growing role that intelligence has in adapting to the regional threat environment, stating: "it is ever more necessary to acquire signs of various situations in advance and collect, analyze, and share information promptly and appropriately...broader and more comprehensive intelligence capabilities are essential for Japanese national security."⁶⁹ In particular, Japan has focused investments into its capabilities for "collecting, processing and analyzing radio waves on military communications and radio waves emitted from electronic weapons."⁷⁰ Japan's SIGINT construction efforts include a significant build-up over the past decade of a robust infrastructure for monitoring Chinese and North Korean emitters.

The JASDF is an important collector of SIGINT. Its Air Information Collection Units operate at least seven SIGINT stations that report to the Radio-wave Collection Group of the Air Intelligence Wing. The Japanese Air Intelligence Wing (or Operational Intelligence Unit) – which is also responsible for supporting Japan's BMD enterprise – is based at Japan's ADC headquarters at Yokota.⁷¹ This streamlines the intelligence process, as radar surveillance data and SIGINT collected by ground stations and aircraft are all sent to the ADC in near real time, as well as the MoD's Joint Staff Office, for further analysis.⁷²

Working in tandem with SIGINT stations, JASDF reportedly operates RF-4J ELINT collection aircraft, E-2C airborne early warning aircraft, E-767 airborne command and control aircraft, YS-11EB ELINT collection aircraft, YS-11EA electronic warfare aircraft, and EC-1 SIGINT aircraft.⁷³ Japan also has various other ground stations for SIGINT-collection, including large stations operated by the Defense Intelligence Headquarters' (DIH) *Chobetsu*, Japan's executive authority for SIGINT.⁷⁴

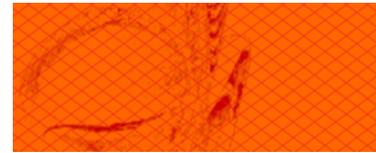


Operational and Tactical JSDF Capabilities

At the operational and tactical levels, each service branch has begun to take steps towards a long term effort to adapt to the evolving security environment. The Japanese Ground Self Defense Force (JGSDF) is improving its long-range mobility, upgrading air and missile interceptor batteries, and increasing off-shore island defense capabilities while reducing the number of its tanks and artillery batteries.⁷⁵ To improve its long-range mobility, the JGSDF is conducting exercises to test its ability to rapidly transport JGSDF units from Hokkaido to Southern Japan. In support of Japan's air and missile defense enterprise, the JGSDF has upgraded to PAC-3 interceptors for lower-tier "point defense" against ballistic missiles and air-breathing aircraft. To increase its island defense capabilities, JGSDF personnel are training with U.S. Marines. Looking ahead, key variables regarding future JGSDF capabilities include possible decisions to acquire THAAD⁷⁶ or land-based SM-3 interceptors for upper-tier BMD; equip multiple launch rocket systems (MLRS) with sensor fused munitions for technology-enabled shore defense; and stand up special operations units dedicated to amphibious warfare and off-shore island defense.

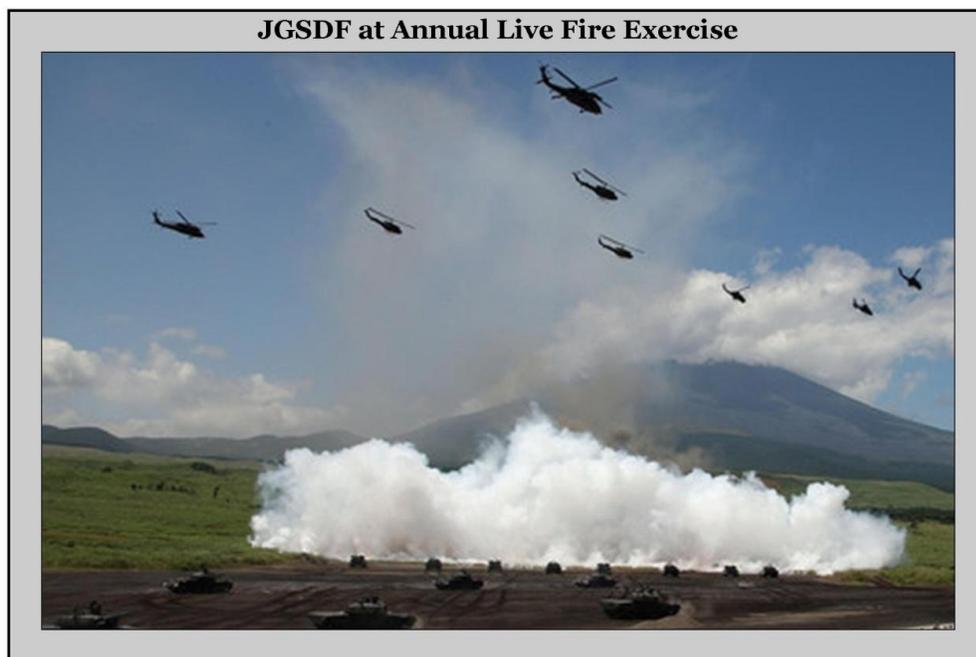
The Japanese Maritime Self Defense Force (JMSDF) is improving its sea territory and sea lane defense capabilities through regular ISR and anti-submarine warfare operations. This effort includes the restructuring of its Escort Ship Squadrons into a 48 ship force grouped into one Escort Corps (16 ships) and one Escort Group (32 ships), with basic units consisting of four and eight ships, respectively. Deployments are now structured to operate in watch and surveillance operations in and around the Ryukyu Islands. To patrol key sea traffic points in the East China Sea and the Sea of Japan, the JMSDF is increasing the number of its stealth submarines from 16 to 22. This will provide Japan with a nearly undetectable means "to regularly conduct ISR over a wide range of waters surrounding Japan including the southwestern area."⁷⁷ To further improve its ability to conduct continuous ISR operations in the East China Sea, the JMSDF is increasing the presence of P-3C patrol aircraft on Okinawa.⁷⁸ Looking ahead, key variables regarding future JMSDF capabilities include possible decisions to acquire F-35B short take-off and vertical landing (STOVL) fighters, advanced ship-to-ship and ship-to-shore missiles, and amphibious warfare units such as naval infantry or marines.

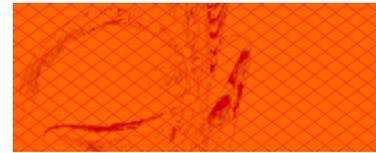
The Japanese Air Self Defense Force (JASDF) plans to improve its capacity for maintaining air superiority through the future acquisition of fifth-generation F-35A strike fighters even as it decreases its total number of combat aircraft. The decision to select the F-35A has significance beyond the air superiority mission. Given its advanced stealth capabilities, the F-35A is expected to provide Japan with a precision strike capability that it currently lacks. In the interim, the JASDF is also moving an additional



squadron of F-15s to Okinawa to double its fighter presence in the Southwestern Air Defense Sector.⁷⁹ To improve its ISR capabilities, the JASDF is seeking to acquire two or three RQ-4 “Global Hawk” UAVs by 2015.⁸⁰ However, while it has emphasized active air and missile defense measures, including improved ISR for early-warning and BMD operations, the JASDF does not appear to be investing in passive air and missile defense measures.⁸¹ Likewise, it appears that the JASDF does not have plans to ensure the security of Japan’s military satellites or counter adversary space assets. This could leave Japan vulnerable to a coercive aerospace campaign launched from China.⁸² Looking ahead, key variables regarding future JASDF capabilities include possible decisions to acquire passive defenses to assure the utility of its otherwise superior air capabilities in times of crisis or conflict.

Despite the efforts underway to improve the JSDF’s strategic, operational and tactical capabilities, Japanese policymakers and Ministry of Defense (MoD) officials are concerned that the measures authorized by the 2010 NDPG may be insufficient to pace the threats that are developing in Japan’s evolving security environment. As such, the Japanese MoD is currently reviewing its defense guidelines with an eye toward releasing an updated NDPG in late 2013. Key issues under consideration may include the requirement for a long-range precision strike program based on cruise missile technology, a Japanese amphibious assault force, and a joint cyber command.⁸³ The new NDPG should also discuss Japan’s role in the U.S. rebalance to Asia, as well as how Japan will be integrated into the U.S. military’s Air-Sea Battle concept of operations.





Japan, the U.S. Rebalance and Air-Sea Battle

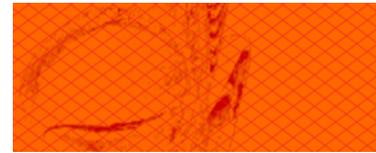
Japan's 2012 defense white paper reiterates the message of 2010 NDPG, noting the heightened importance of the U.S.-Japan alliance in light of the evolving security environment. Specifically, Japan resolves to adapt to this environment and deepen the U.S.-Japan alliance by:

- Engaging in strategic dialogues and coordinating specific policies with the U.S.;
- Cooperating on intelligence, contingency planning, ballistic missile defense, and other matters;
- Studying measures to enhance Japan's role in strengthening U.S. deterrent and response capabilities to meet regional contingencies; and
- Strengthening joint training, joint usage of facilities, and joint enhancement of global commons (including space, cyberspace, international sea lanes).⁸⁴

However, since the release of the 2010 NDPG there have been significant changes in the U.S. defense strategy that have important implications for Japan and the alliance. In November 2011, former Secretary of State Clinton publically announced America's reorientation or "pivot" toward the Asia-Pacific.⁸⁵ That same month the Pentagon announced the establishment of an Air-Sea Battle Office.⁸⁶ This was followed in January 2012 by President Obama's introduction of new defense strategic guidance, to which the Chairman of the Joint Chiefs of Staff added the Joint Operational Access Concept later that same month.⁸⁷

These developments are being driven by an understanding that the U.S. is at strategic inflection point due to factors related to the end of the wars in Iraq and Afghanistan, the poor fiscal health of the nation, and the potential decline in America's relative strength vis-à-vis China. Broadly speaking, the solutions that are being proposed to address the U.S. need to rebalance toward the Asia-Pacific include an "all of government effort" to increase investments into educational, diplomatic, economic, and strategic investments into the region. As the United States' most important ally in the Asia-Pacific, Japan is poised to play a leading role in enabling the success of the U.S. rebalance.

In terms of security issues, the most serious challenge facing the U.S.-Japan alliance will be maintaining access to critical air and naval bases in Japan. China's sophisticated "anti-access, area-denial" (A2/AD)⁸⁸ capabilities represent a driving force compelling Japan and the U.S. to develop strategies for being able to effectively execute power projection operations. In a future conflict scenario, China's integrated strike capabilities could allow for multi-dimensional offensive that would likely open with cyber and anti-

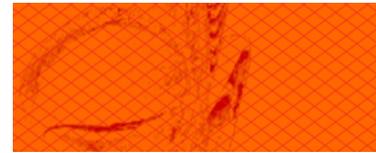


satellite attacks, followed with ballistic and cruise missile raids that were coordinated with UAVs and UCAVs. Once critical node targets were sufficiently degraded, follow-on waves of manned aircraft and submarines would inflict strikes on second tier targets, while also establishing area denial zones through air and maritime interdiction operations.

Notional targets for an integrated strike campaign against Japan include critical command and control centers, such as the Japanese ADC and the Headquarters of U.S. Forces Japan at Yokota Air Base outside Tokyo; the U.S. Seventh Fleet and Japanese Self-Defense Fleet headquarters in Yokosuka; and the Ground Self Defense Force headquarters in Ichigaya, Tokyo. Regional district command centers, communications facilities, satellites (and their ground stations), early-warning radar sites, air bases and naval ports would represent second tier targets. Given the vast spaces involved, aerospace power would be the critical factor deciding the outcome of the conflict.

To counter the threat of a potential Chinese integrated strike campaign against Japan that could devastate the JSDF's defensive capabilities and severely undermine the capacity of the U.S. to project power in the West Pacific, it will be critical for Washington and Tokyo to take both active and passive measures to prepare for worst-case scenarios. Like the JSDF, the U.S. military is focusing on efforts to improve its space, missile defense, and intelligence posture around Japan. The U.S. Military is also beginning to invest in long term programs in the Asia-Pacific under its Air-Sea Battle concept of operations that will improve its ability to sustain operations in theater.

At the high end of the spectrum, the U.S. is deploying a next-generation space-based BMD system based on Space-based Infrared System (SBIRS) satellites, and their integrated ground components. When complete, SBIRS will consist of four SBIRS-High satellites in geosynchronous orbits (GEO) and two in highly elliptical orbits (HEO).⁸⁹ These satellites provide a revolutionary early warning system that is sensitive enough to detect and target mobile missile launchers from their engines' heat signatures and will have a crucial role to play in missile defense.⁹⁰ SBIRS satellites are currently augmenting the Defense Support Program (DSP) satellites in GEO that they are designed to eventually replace. DSP satellites have far out-performed expectations and greatly exceeded their design lives, allowing them to stay on station while the much delayed SBIRS-High satellites are completed.⁹¹ This combination of SBIRS and DSP satellites has been utilized in the creation of the theater event system (TES) in order to increase defense against growing ballistic and cruise missile threats.

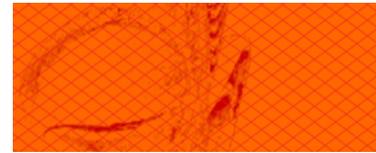


The TES is comprised of three networked elements: SBIRS, which in combination with DSP satellites provide tactical and strategic missile warning functions; the joint tactical ground station (JTAGS) for mobile in-theater processing; and the classified tactical detection and reporting (TACDAR) system comprised of sensors which ride on unidentified host satellites. The TES reports theater missile threats over two types of satellite broadcast networks with the data incorporated into a number of different battle-management systems including the Airborne Warning and Control System (AWACS) and the Air Defense Systems Integrator (ADSI).⁹² These elements work in concert with air and ground-based warning sensors and ground-based missile interceptors.

In the Asia-Pacific region, U.S. space-based BMD systems are augmented by long-range warning sensors like the mobile Sea-Based X-band (SBX) radar in Honolulu.⁹³ The U.S. Navy also plans to deploy its most advanced Aegis BMD cruisers and destroyers to the region. On Guam, the U.S. Army Air and Missile Defense Command (AAMDC) is in the process of deploying a missile defense task force for the Pacific region. This would include a THAAD battery and a PAC-3 battery for ballistic and cruise missile defense.⁹⁴

In terms of point defense, USFJ has been increasing its deployment of BMD units to Japan. In 2006, USFJ deployed a mobile X-band radar system to Shariki Air Base (AB) in Aomori Prefecture and a PAC-3 battalion to Kadena Air Base on Okinawa.⁹⁵ That same year, the U.S. Navy began forward deploying BMD capable Aegis destroyers armed with SM-3 interceptors to Japan.⁹⁶ In 2007, a JTAGS was established at Misawa Air Base in Aomori Prefecture.⁹⁷ More recently, the Pentagon announced its intention to deploy a second mobile X-band radar system to Kyotango, near Kyoto.⁹⁸

Japan also cooperates extensively with the U.S. on SIGINT collection, and hosts at least three major U.S. SIGINT sites. This includes a large site at Misawa, reportedly once the largest U.S. SIGINT complex in Asia and formerly the largest such complex in the world. Misawa, the location of the Northern Air Defense Force Headquarters, is also home to a joint-service, US-run antenna array as well as extensive satellite communications (SATCOM) SIGINT facilities.⁹⁹ Two other SIGINT stations of note are the US Navy's Yokosuka SIGINT collection and processing station, and the Navy's SIGINT site at Camp Hansen, Okinawa.¹⁰⁰



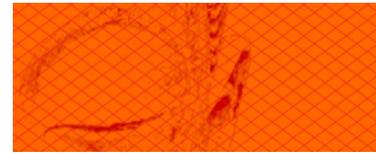
Toward an Allied Air-Sea Battle

The Air-Sea Battle concept of operations is a classified Pentagon framework for coping with the rapid spread of A2AD capabilities. Publicly available information indicates that it seeks closer cooperation between the Air Force and the Navy in order to counter the potential for a devastating enemy attack on forward-deployed forces using sophisticated, but relatively inexpensive, long-range strike systems. Air-Sea Battle also calls for closer cooperation between U.S. forces and allies in forward deployed locations. Because of its strategic location and close alliance with the U.S., Japan will naturally play a vital role in the success – or failure – of the concept.

There are several indicators as to how successful the U.S.-Japan alliance is likely to be in shaping the future security environment in the West Pacific. At the tactical level, Chinese A2AD capabilities will add complexity to air base and carrier fleet defense and impose greater risks to aircraft and warships operating in contested area-denial areas. To meet these challenges, it will be imperative that American and Japanese investments are made in electromagnetic and laser weapon technologies for air base and ship defenses. Greater investments are also required in electronic, cyber, and space warfare so that aggressors face a layered defense that includes both kinetic and non-kinetic means.

Even with these investments it is possible that Japan could see a sharp deterioration in its security environment if China continues to deploy more sophisticated variants of the weapon systems it is currently fielding. This is because, at least notionally speaking, Chinese cruise and ballistic missiles, UAVs, ASATs and cyber attacks could be launched from dispersed, interior bases in highly coordinated raids with little or no warning. Compounding the problem, China has a redundant network of buried fiber optic cables that allows for tight electronic emissions control. In the event of an attack, it is possible that U.S. and Japanese sensors would be unable to provide adequate early warning until long-range precision strike weapons were already closing on their targets, by which time it could be too late to mount an effective defense. This would be especially so if – as must be expected – opening missile and drone raids were timed to coincide with follow-on waves of manned fighter bombers that were launched to maximize windows of opportunity created by anti-satellite attacks and cyber-attacks on command and control nodes.

With the threat of having air and missile defense systems rapidly overwhelmed during attacks, the U.S. and Japan could be forced to invest in a large forward deployed presence that was on constant alert during crisis situations. That would increase the risk

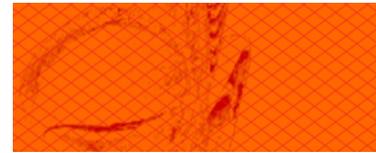


of mistakes, accidents and rapid escalation. It would also risk giving Beijing a false sense of security, in that Chinese war planners may convince decision-makers that by taking the initiative at the outset of armed conflict through carefully timed raids, they would be able to control the flow and tempo of follow-on operations.

Adding to the temptation to attack first, relatively expendable (and cheap) weapons could allow the Chinese to affect strategic changes that until recently were only achievable through the use of nuclear weapons. That could bring the bar down for initiating a conflict without addressing the escalation dangers inherent in such a move. In effect, China's growing range of precision strike capabilities could make it easier to imagine a successful first strike against U.S. and Japanese air force and naval groups operating in the Western Pacific. However, such a first strike would invite immediate retaliation against the satellite, airborne and ground communications infrastructure facilitating the command and control of these operations. It would also compel U.S. and Japanese strikes on coastal and inland Chinese targets.

Looking ahead, the compression of decision-making timelines, along with the threat of crippling attacks on communications networks, would argue for the decentralization of command authorities in Japan for operational and tactical reasons. Yet the strategic effects of such a decision could cascade in unforeseen ways, with relatively benign tactical events potentially spinning out of control. Whatever Japan does to adapt, the proliferation of Chinese weapons systems capable of long-range precision strike operations will negatively impact on the strategic stability in Japan's security environment. Chinese weapons exacerbate an already offense-dominated environment, forcing a situation where both sides could be on high alert for the others' first strike – potentially even during period of relative calm, but especially during times of regional tension – with all the ensuing risk for miscalculation and escalation that entails.

This emerging situation has important near-term and long-term implications. In the near-term, it will be critical for the United States to fully integrate Japan into Air-Sea Battle. Should this effort fail, China could eventually be tempted to resolve outstanding political disputes through military means, and if the U.S.-Japan alliance lacked an adequate conventional deterrent against China's military power, more weight would have to be placed on the threat of nuclear retaliation in order to maintain stability. However, it is very difficult to imagine U.S. decision-makers resolving to respond to conventional attacks with nuclear weapons, especially if only American and Japanese military targets had been struck. As such, the credibility of the U.S. nuclear umbrella will begin to erode if there is no credible conventional deterrent to which the nation can first turn for escalatory step control. This situation would naturally push Japan toward the development of its own nuclear deterrent, something that, while not altogether

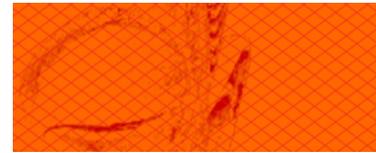


negative from the perspective regional stability maintenance, would not have positive effects on the alliance, nor on the reputation of the United States as the guardian of regional security.

In the long-term, it will be critical for the United States and Japan to develop enough conventional war fighting leverage to convince Beijing to agree to an arms control treaty that can greatly curtail the PLA's build-up of destabilizing first-strike weapons. Indeed, ground launched cruise and ballistic missiles (and UAVs) have long been of sufficient concern to warrant international agreements to limit their proliferation. The 1987 Intermediate Range Nuclear Forces (INF) Treaty led to the elimination of U.S. and Soviet land-based cruise and ballistic missiles with ranges of between 500 and 5,500 kilometers.¹⁰¹ Unfortunately, China was not included in the treaty negotiations. As a result, by 2020 it will be increasingly unlikely that the U.S. and Japan will be able to mount an effective defense against China's intermediate ranged conventional strike weapons without drastic – and politically excruciating – adjustments to their respective defense budgets. To avoid the regional destabilization that would result from a loss of conventional deterrence, it is therefore advisable for the U.S. government to temporarily suspend its commitments to the INF Treaty until China can be brought into the treaty framework.¹⁰²

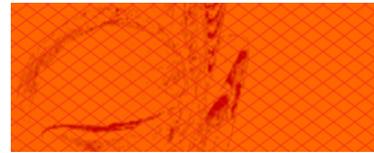
Ultimately, China's communist party leadership is probably only going see it in its interest to join the INF Treaty if at least one of two things occurs. The first would be that the United States begins to develop and deploy conventionally armed ground launched missiles in Japan that have ranges in excess of 3,000 kilometers. The American experience in the 1980s with the Soviets in Europe should be instructive here.¹⁰³ The second would be that the United States and Japan make technological breakthroughs in missile defense technologies which would allow them to intercept Chinese missiles with directed energy weapons that cost less per shot than their targets. This would dramatically change the offense-defense balance of warfare, and radically improve the defense of Japan and other U.S. allies. However, such technological breakthroughs, while foreseeable, are not guaranteed to happen anytime soon.

What follows are our recommendations as to what policymakers in Tokyo and Washington should consider as they assess programs and strategies to assure peace and stability in the Asia-Pacific in the face of the challenges we have attempted to describe in this monograph.

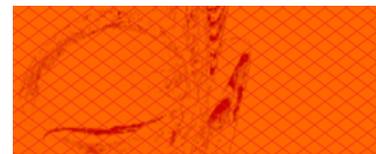


Recommendations

1. The United States and Japan should undertake a joint “Net Assessment” of China’s military trajectory and its implications for the U.S.-Japan Alliance.
2. The United States and Japan should complete the current Roles and Missions review, and should regularize a process for dynamic, sustained discussions on Roles and Missions to enable more timely revisions consistent with the fast evolving security environment.
3. The United States must complete its QDR, and begin to reconcile resource constraints with rhetorical goals of “rebalancing.” The United States must soon be in a position to convey to Japan our specific expectations for the alliance going forward, to include full integration of the JSDF into the Pentagon’s Air-Sea Battle concept of operations. To be effective, this would include joint experimentation and training, as well as burden sharing in terms of deep interdiction missions.
4. The United States and Japan should actively seek and pursue opportunities for joint development of future weaponry and related capabilities. The United States should fully exploit the relaxation of Japan’s “three principles on arms exports.”
5. The United States and Japan should pursue joint basing and “hardening” simultaneously. Joint facilities should benefit from mature protection capabilities, to include cost-effective aircraft shelters, deeply buried command and control facilities, proven rapid runway repair capabilities, redundant communication lines, underground logistical stations, and decoys.
6. Japanese defense planners should actively promote the integration of capabilities appropriate for new battle spaces through the establishment of a joint strategic computing and cyber warfare force. They should also increase cooperation with the United States on unmanned aerial system and space operations.
7. The United States and Japan must defeat the ballistic and cruise missile capabilities of the PLA. To counter the inherently destabilizing nature of China’s missile force, Washington and Tokyo should strongly advocate for Beijing’s inclusion in the INF Treaty. Should these political efforts initially fail, the United States military should develop and forward deploy conventional ground-launched missile systems in Japan as a means of increasing diplomatic leverage.



8. As Japan embarks on a path to reinterpret and/or revise its constitution, the United States and Japan should create a more ambitious joint training program to reflect greater alliance capacity to deal with highly stressful wartime contingencies. To better enable this effort, Washington should increase the number of American military officers and civilian officials with Japanese language and cultural training.
9. The United States and Japan should embrace the goal of becoming full “resource” allies. This must envision not only secure and reliable sources of energy in the event of a crisis, but assured supply of other critical resources such as rare earth minerals.
10. Washington and Tokyo have a real stake in peace, especially since a war in the Western Pacific would almost certainly involve the use of highly destructive conventional – and possibly nuclear – weapons. Therefore, it is in the interest of both governments to educate their publics to recognize the common threats they face and seek their support for a stronger U.S.-Japan alliance.



Notes

¹ See the Minister's statement in the forward to *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), at http://www.mod.go.jp/e/publ/w_paper/pdf/2012/01_Foreword.pdf.

² Unless otherwise noted, this section draws from *Military and Security Developments Involving the People's Republic of China 2012* (Washington D.C.: Office of the Secretary of Defense, May 2012), at http://www.defense.gov/pubs/pdfs/2012_CMPR_Final.pdf; "Security Environment Surrounding Japan: China," in *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), at http://www.mod.go.jp/e/publ/w_paper/pdf/2012/07_Part1_Chapter1_Sec3.pdf; and Jan Van Tol, *AirSea Battle: a Point of Departure Operational Concept* (Washington D.C.: Center for Strategic and Budgetary Analysis, May 2010), at <http://www.csbaonline.org/publications/2010/05/airsea-battle-concept/>.

³ While the PLA Second Artillery Force was reported to have fielded 75-100 DF-21 MRBMs by 2012, it is unclear how many of these were the conventionally armed DF-21C variants.

⁴ Rogge Chen and Sofia Wu, "Taiwan concerned about China's DF-16 missile deployment," *Focus Taiwan News Channel*, March 20, 2013, at <http://focustaiwan.tw/news/aall/201303200039.aspx>.

⁵ For detailed discussions on China's ASBM program and its implications, see Mark Stokes, "China's Evolving Conventional Strategic Strike Capability: The anti-ship ballistic missile challenge to U.S. maritime operations in the Western Pacific and beyond," *Project 2049 Institute Occasional Paper*, September 14, 2009, at http://project2049.net/documents/chinese_anti_ship_ballistic_missile_asbm.pdf; Andrew S. Erickson and David D. Yang, "On the Verge of a Game-Changer," *Proceedings Magazine*, May 2009, at <http://www.usni.org/magazines/proceedings/2009-05/verge-game-changer>; Andrew S. Erickson, "China's Anti-Ship Ballistic Missile (ASBM) Reaches Equivalent of 'Initial Operating Capability' (IOC)- Where It's going and what it means," at <http://www.andrewerickson.com/2011/07/china%E2%80%99s-anti-ship-ballistic-missile-asbm-reaches-equivalent-of-%E2%80%9Cinitial-operational-capability%E2%80%9D-ioc%E2%80%94where-it%E2%80%99s-going-and-what-it-means/>.

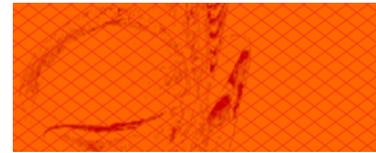
⁶ North Korea is also developing the *Musudan* intermediate range ballistic missile (IRBM) and the *Taepodong-2* intercontinental ballistic missile (ICBM). Because both missiles are being developed to have ranges far longer than what would be required to cover Japan, it seems probable that their targets would actually be U.S. bases in Guam and Alaska.

⁷ See "No Dong 1," *Missile Threat: A Project of the George C. Marshall and Claremont Institute*, October 26, 2012, at <http://missilethreat.com/missiles/no-dong-1/?country=north-korea#north-korea>; and "CNS Special Report on North Korean Ballistic Missile Capabilities," *Center for Nonproliferation Studies*, March 22, 2006, at <http://cns.miis.edu/stories/pdfs/060321.pdf>.

⁸ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 18.

⁹ See *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), pp. 17-19.

¹⁰ Liquid-fueled ballistic missiles take significantly longer to prepare for launch than solid-fueled missiles. The use of liquid propellant to fuel missiles limits operational flexibility in other ways. Because liquid propellants are highly toxic and require special storage and handling, missile launching units generally cannot travel far from basing facilities. To counter these disadvantages, North Korea reportedly has



constructed an extensive system of underground shelters for their missiles. See “CNS Special Report on North Korean Ballistic Missile Capabilities,” *Center for Nonproliferation Studies*, March 22, 2006, pp. 3-4, at <http://cns.miis.edu/stories/pdfs/o6o321.pdf>.

¹¹ Unless otherwise noted, this section draws from *Military and Security Developments Involving the People's Republic of China 2012* (Washington D.C.: Office of the Secretary of Defense, May 2012), at http://www.defense.gov/pubs/pdfs/2012_CMPR_Final.pdf; “Security Environment Surrounding Japan: China,” in *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), at http://www.mod.go.jp/e/publ/w_paper/pdf/2012/07_Part1_Chapter1_Sec3.pdf; Jan Van Tol, *AirSea Battle: a Point of Departure Operational Concept* (Washington D.C.: Center for Strategic and Budgetary Analysis, May 2010), at <http://www.csbaonline.org/publications/2010/05/airsea-battle-concept/>; and Andrew S. Erickson, “China’s Modernization of its Naval and Air Power Capabilities,” in Ashley J. Tellis and Travis Tanner (eds.) *Strategic Asia 2012-13: China’s Military Challenge* (Washington D.C., National Bureau of Asian Research, 2012), pp. 61-125.

¹² The PLAAF is also developing a new long-range cruise missile for land-attack and, possibly, anti-ship missions. This missile will be launched from PLAAF’s upgraded *Hong-6* (H-6) bombers. See *Military and Security Developments Involving the People's Republic of China 2012* (Washington D.C.: Office of the Secretary of Defense, May 2012), p. 24 at http://www.defense.gov/pubs/pdfs/2012_CMPR_Final.pdf; and Carlo Kopp and Martin Andrew, “PLA Cruise Missiles/PLA Air-Surface Missiles,” *Air Power Australia*, March 29, 2013, at <http://www.ausairpower.net/APA-PLA-Cruise-Missiles.html>.

¹³ Ronald O’Rourke, *China’s Naval Modernization: Implications for U.S. Navy Capabilities—Background Issues for Congress* (Washington D.C.: Congressional Research Service, March 2013), p. 11, at <http://www.fas.org/sgp/crs/row/RL33153.pdf>.

¹⁴ However, the Second Artillery’s two or three CJ-10 Brigades may not represent a direct threat to Japan given their current locations. They are believed to be based in southeastern China, well out of range of most Japanese targets. Ian Easton, “The Assassin Under the Radar: China’s DH-10 Cruise Missile Program,” *Project 2049 Futuregram 09-005*, October 1, 2009, p. 4, at http://project2049.net/documents/assassin_under_radar_china_cruise_missile.pdf.

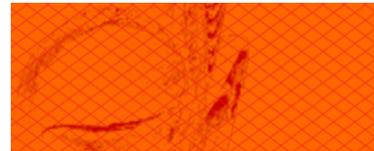
¹⁵ Ronald O’Rourke, *China’s Naval Modernization: Implications for U.S. Navy Capabilities—Background Issues for Congress* (Washington D.C.: Congressional Research Service, March 2013), p. 39, at <http://www.fas.org/sgp/crs/row/RL33153.pdf>; and “Hong-6 Bomber,” *Sino Defense*, April 21, 2008, at <http://www.sinodefence.com/airforce/groundattack/h6.asp>.

¹⁶ *Military and Security Developments Involving the People's Republic of China 2012* (Washington D.C.: Office of the Secretary of Defense, May 2012), p. 42, at http://www.defense.gov/pubs/pdfs/2012_CMPR_Final.pdf.

¹⁷ Ibid.

¹⁸ Ian Easton, “The Assassin Under the Radar: China’s DH-10 Cruise Missile Program,” *Project 2049 Futuregram 09-005*, October 1, 2009, p. 1, at http://project2049.net/documents/assassin_under_radar_china_cruise_missile.pdf.

¹⁹ While it is not clear how many cruise missiles North Korea fields, it has reportedly acquired the KN-01 ASCM and HY-2 “Silkworm” ASCM. See Carlo Kopp and Martin Andrew, “PLA Cruise Missiles/PLA Air-



Surface Missiles,” *Air Power Australia*, March 29, 2013, at <http://www.ausairpower.net/APA-PLA-Cruise-Missiles.html>.

²⁰ Unless otherwise noted, this section draws from *Military and Security Developments Involving the People's Republic of China 2012* (Washington D.C.: Office of the Secretary of Defense, May 2012), at http://www.defense.gov/pubs/pdfs/2012_CMPR_Final.pdf; “Security Environment Surrounding Japan: China,” in *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), at http://www.mod.go.jp/e/publ/w_paper/pdf/2012/07_Part1_Chapter1_Sec3.pdf; Jan Van Tol, *AirSea Battle: a Point of Departure Operational Concept* (Washington D.C.: Center for Strategic and Budgetary Analysis, May 2010), at <http://www.csbaonline.org/publications/2010/05/airsea-battle-concept/>; and Andrew S. Erickson, “China’s Modernization of its Naval and Air Power Capabilities,” in Ashley J. Tellis and Travis Tanner (eds.) *Strategic Asia 2012-13: China’s Military Challenge* (Washington D.C., National Bureau of Asian Research, 2012), pp. 61-125.

²¹ Ronald O’Rourke, *China’s Naval Modernization: Implications for U.S. Navy Capabilities—Background Issues for Congress* (Washington D.C.: Congressional Research Service, March 2013), pp. 16-17, 23, at <http://www.fas.org/sgp/crs/row/RL33153.pdf>.

²² *Ibid.*, p. 14.

²³ *Ibid.*, p. 16-17.

²⁴ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 22.

²⁵ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 20.

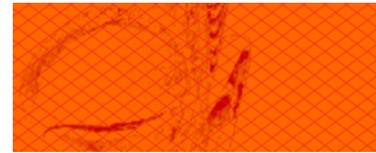
²⁶ *Military and Security Developments Involving the People's Republic of China 2012* (Washington D.C.: Office of the Secretary of Defense, May 2012), p. 9, at http://www.defense.gov/pubs/pdfs/2012_CMPR_Final.pdf; and Ian Easton “The Great Game in Space: China’s Evolving ASAT Weapons Programs and Their Implications for Future U.S. Strategy,” *Project 2049 Institute Occasional Paper*, June 24, 2009, at http://project2049.net/documents/china_asat_weapons_the_great_game_in_space.pdf.

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²⁸ See Defense Science Board, *Task Force Report: Resilient Military Systems and the Advanced Cyber Threat* (Washington D.C.: Department of Defense, 2013), at <http://www.acq.osd.mil/dsb/reports/ResilientMilitarySystems.CyberThreat.pdf>; and *APT1: Exposing One of China’s Cyber Espionage Units*, (Alexandria, VA: Mandiant, 2013), at http://intelreport.mandiant.com/Mandiant_APT1_Report.pdf.

²⁹ Mark A. Stokes, Jenny Lin and L.C. Russell Hsiao, *The Chinese People’s Liberation Army Signals Intelligence and Cyber Reconnaissance Infrastructure*, *Project 2049 Institute Occasional Paper*, November 11, 2011, p. 8, at http://project2049.net/documents/pla_third_department_sigint_cyber_stokes_lin_hsiao.pdf.

³⁰ *Ibid.*



³¹ In the case of the Shenyang MR, the TRB office in closest proximity to Japan would be in Dongning, Heilongjiang. See *Ibid.*, p. 13.

³² *Ibid.*, p. 14.

³³ *Ibid.*, p. 14.

³⁴ ISR refers to intelligence, surveillance, and reconnaissance.

³⁵ *Ibid.*, p. 15.

³⁶ For an excellent overview of Chinese UAV variants, see Andrew S. Erickson, "China's Modernization of its Naval and Air Power Capabilities," in Ashley J. Tellis and Travis Tanner (eds.) *Strategic Asia 2012-13: China's Military Challenge* (Washington D.C., National Bureau of Asian Research, 2012), pp. 121-125. For an overview of the PLA's requirements development process as it pertains to UAVs, see Ian M. Easton and L.C. Russell Hsiao, "The Chinese People's Liberation Army's Unmanned Aerial Vehicle Project: Organizational Capacities and Operational Capabilities," *Project 2049 Institute Occasional Paper*, March 11, 2013, at http://project2049.net/documents/uav_easton_hsiao.pdf.

³⁷ "China to deploy drones to conduct maritime surveillance," *Press Trust of India*, August 29, 2012; "China to promote drones for maritime surveillance," *Xinhua*, September 23, 2012; and "China using satellite to surveil disputed isles, plans drone ops next," *The Japan Times*, September 4, 2012.

³⁸ *NIDS China Security Report 2012* (Tokyo: National Institute for Defense Studies, 2012), p. 20.

³⁹ J. Michael Cole, "New PLA airforce base boosts capabilities," *Taipei Times*, May 28, 2012, at <http://www.taipeitimes.com/News/taiwan/archives/2012/05/28/2003533924>.

⁴⁰ Zhou Ye, Chen Meng, and Pu Zhao, "Saving Fighting Eagle 100 Li's Away – Commander Li Changyong of 8th Company of Regiment of Guangzhou Military Region Skillfully Uses Drone Operation and Control Techniques," *Jiefangjun Bao* [Liberation Army Daily], October 14, 2011, p. 5; and "PLA Expanding Production of Drones," *Want China Times*, December 15, 2011.

⁴¹ Ministry of National Defense of the Republic of China, *100th Anniversary National Defense Report* (Taipei: Ministry of National Defense, July 2011), p. 69.

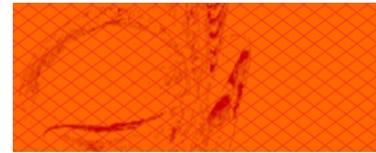
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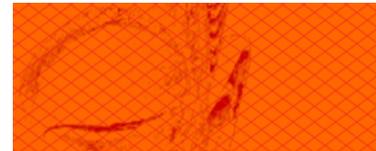
⁴⁴ See Ian M. Easton and L.C. Russell Hsiao, "The Chinese People's Liberation Army's Unmanned Aerial Vehicle Project: Organizational Capacities and Operational Capabilities," *Project 2049 Institute Occasional Paper*, March 11, 2013, at http://project2049.net/documents/uav_easton_hsiao.pdf.

⁴⁵ See Ian M. Easton and L.C. Russell Hsiao, "The Chinese People's Liberation Army's Unmanned Aerial Vehicle Project: Organizational Capacities and Operational Capabilities," *Project 2049 Institute Occasional Paper*, March 11, 2013, at http://project2049.net/documents/uav_easton_hsiao.pdf.

⁴⁶ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 115.



- ⁴⁷ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 118.
- ⁴⁸ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 120.
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- ⁵² *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 158, 174.
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⁶³ Desmond Ball and Richard Tanter, "The Transformation of the JASDF's Intelligence and Surveillance Capabilities for Air and Missile Defense," *Security Challenges*, Vol. 8, No. 3 (Spring 2012), p. 20.

⁶⁴ Vince Little, "Control hub used to direct exercise," *Stars and Stripes*, November 17, 2007, <http://www.stripes.com/article.asp?section=104&article=50313>.

⁶⁵ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 188. In 1995, JASDF first decided to acquire 24 enhanced PAC-2 (or PAC-2 Plus) FUs, which are effective against first generation tactical ballistic missiles and LACMs. The delivery of these PAC-2 Plus missiles began in 1998. Each of the PAC-2 Plus FUs (four per air defense missile group) had eight launch stations for a total of 768 missiles. Three more FUs (with 96 missiles) were purchased around 2000-01, for a total of 27 PAC-2 Plus FUs and 864 missiles. Many of these have now been replaced by PAC-3 systems. See Ministry of Defense (MOD), *Defense of Japan 2009*, (Ministry of Defense, Tokyo, 2009), chapter 1, section 2, p. 185, http://www.mod.go.jp/e/publ/w_paper/pdf/2009/28Part3_Chapter1_Sec2.pdf.

⁶⁶ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 188.

⁶⁷ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 188. See also

Desmond Ball, "Whither the Japan-Australia Security Relationship?" *Austral Policy Forum 6-32A Report*, September 21, 2006, <http://www.nautilus.org/~rmit/forum-reports/o632a-ball.html>.

⁶⁸ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 192.

⁶⁹ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 210.

⁷⁰ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 210.

⁷¹ Desmond Ball and Richard Tanter, "The Transformation of the JASDF's Intelligence and Surveillance Capabilities for Air and Missile Defense," *Security Challenges*, Vol. 8, No. 3 (Spring 2012), p. 21.

⁷² Ibid.

⁷³ Desmond Ball, *Information Warfare In Asia: Signals Intelligence (SIGINT), Electronic Warfare (EW), And Cyber-Warfare*, (Conference Paper prepared for the Canadian Association for Security and Intelligence Studies, September 2002), p. 25. See also "Aerospace Source Book 2007: World Military Aircraft Inventory", *Aviation Week & Space Technology*, January 15, 2007.

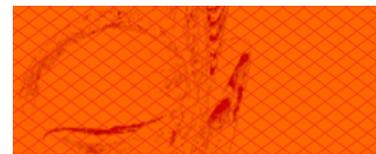
⁷⁴ Desmond Ball, *Information Warfare In Asia: Signals Intelligence (SIGINT), Electronic Warfare (EW), And Cyber-Warfare*, (Conference Paper prepared for the Canadian Association for Security and Intelligence Studies, September 2002), p. 13.

⁷⁵ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 121.

⁷⁶ THAAD is a reference to Terminal High Altitude Area Defense, a U.S. Army system to shoot down SRBMs, MRBMs and IRBMs using missile interceptors.

⁷⁷ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 123.

⁷⁸ According to discussions with Japanese military analysts and officials, there may be some 12 to 20 such aircraft deployed to the Naha civil-military airport. This move is being accompanied by the construction of



new hangars, the addition of a squadron of F-15s, and the standing up of a new E-2 “Hawkeye” airborne early warning and control (AWACS) unit.

⁷⁹ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 126.

⁸⁰ James Hardy, “The New Eyes in East Asia’s Skies,” *The Diplomat*, January 4, 2013, at <http://thediplomat.com/2013/01/04/s-korea-to-purchase-global-hawk-uavs/>.

⁸¹ Passive measures would include concrete aircraft shelters; deeply buried command and control centers; rapid runway repair capabilities; underground facilities for pilots, aircraft crews, fuel, munitions and supplies; redundant runways; and decoys.

⁸² See Mark Stokes and Ian Easton, “Evolving Aerospace Trends In the Asia-Pacific Region: Implications for Stability in the Taiwan Strait and Beyond,” *Project 2049 Institute Occasional Paper*, May 27, 2010 at http://www.project2049.net/documents/aerospace_trends_asia_pacific_region_stokes_easton.pdf.

⁸³ Meetings and with Japanese defense officials and scholars in Tokyo and Arlington (VA), January – March 2013, and authors’ correspondence.

⁸⁴ *Defense of Japan 2012* (Tokyo: Ministry of Defense, 2012), p. 117.

⁸⁵ See Hillary Clinton, “America’s Pacific Century,” *Foreign Policy*, November 2011, at http://www.foreignpolicy.com/articles/2011/10/11/americas_pacific_century.

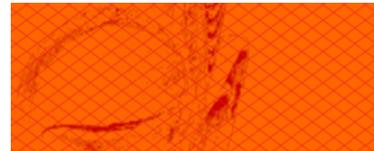
⁸⁶ Christopher P. Cavas, “Air-Sea Battle Office targets DoD blind spots,” *Air Force Times*, November 10, 2011, at <http://www.airforcetimes.com/article/20111110/NEWS/111100329/Air-Sea-Battle-Office-targets-DoD-blind-spots>.

⁸⁷ See Jim Garamone, “Obama: Defense Strategy will Maintain Pre-eminence,” *American Forces Press Service*, January 5, 2012, at <http://www.defense.gov/news/newsarticle.aspx?id=66683>; and Ann Roosevelt, “Joint Chiefs Chairman Releases Joint Operational Access Concept,” *Defense Daily*, January 19, 2012, at http://www.defensedaily.com/free/Joint-Chiefs-Chairman-Releases-Joint-Operational-Access-Concept_16464.html.

⁸⁸ Anti-access refers to what are often long-ranged capabilities designed to threaten an adversary preparing to enter into an operational area. Area-denial refers to shorter ranged capabilities that threaten an adversary once it is in an operational area. See *Joint Operational Access Concept: Version 1.0* (Washington D.C.: Department of Defense, January 17, 2012), p. i, at http://www.defense.gov/pubs/pdfs/JOAC_Jan%202012_Signed.pdf.

⁸⁹ Edward P. Chatters IV and Bryan Eberhardt, “Missile Warning Systems.” In *AU-18 Space Primer*, Prepared by Air Command and Staff College Space Research Seminars, (Air University Press, Maxwell Air Force Base, Alabama, September 2009), p.228, <http://space.au.af.mil/au-18-2009/au-18-2009.pdf>. “SBIRS Team Completes Critical Design Reviews for Follow-On Production Program for HEO and GEO Payloads,” *Los Angeles Air Force Base News*, January 4, 2010, <http://www.losangeles.af.mil/news/story.asp?id=123184063>. Amy Butler, “Classified Satellite Failure Led to Latest SBIRS Delay,” *Aerospace Daily and Defense Report*, October 15, 2007, <http://abcnews.go.com/Technology/story?id=3732391&page=1>.

⁹⁰ Jeremy Singer, “Downshifting in Space,” *Airforce Magazine*, April 2009, <http://www.airforce-magazine.com/MagazineArchive/Pages/2009/April%202009/0409space.aspx>.



⁹¹ Edward P. Chatters IV and Bryan Eberhardt, "Missile Warning Systems." In *AU-18 Space Primer*, Prepared by Air Command and Staff College Space Research Seminars, (Air University Press, Maxwell Air Force Base, Alabama, September 2009), p.229, <http://space.au.af.mil/au-18-2009/au-18-2009.pdf>.

⁹² Ibid, pp. 230-231.

⁹³ "Sea-Based X-Band Radar," *Missile Defense Agency Factsheet*, February, 2010, <http://www.mda.mil/global/documents/pdf/sbx.pdf>.

⁹⁴ David W. Eastburn, "Island Paradise at Forefront of Missile Defense," *Army.Mil News*, November 16, 2009, <http://www.army.mil/-news/2009/11/16/30499-island-paradise-at-the-forefront-of-missile-defense/>.

⁹⁵ Ministry of Defense (MOD), *Japan's BMD*, (Ministry of Defense, Tokyo, February 2009), p. 17, http://www.mod.go.jp/e/d_policy/bmd/bmd2009.pdf, accessed December 28, 2009.

⁹⁶ The USS Shiloh was first deployed with mid-course interception capabilities to Yokosuka Naval Base in August 2006.

⁹⁷ Ministry of Defense (MOD), *Defense of Japan 2009*, (Ministry of Defense, Tokyo, 2009), chapter 1, section 2, p. 190, http://www.mod.go.jp/e/publ/w_paper/pdf/2009/28Part3_Chapter1_Sec2.pdf, accessed December 21, 2009.

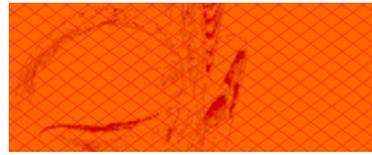
⁹⁸ "US radar to boost missile defense in Japan," *Australia Network News*, February 24, 2013, at <http://www.abc.net.au/news/2013-02-24/an-us2c-japan-plan-radar-system-to-boost-defence/4536770>.

⁹⁹ Desmond Ball, *Information Warfare In Asia: Signals Intelligence (SIGINT), Electronic Warfare (EW), And Cyber-Warfare*, (Conference Paper prepared for the Canadian Association for Security and Intelligence Studies, September 2002), p. 9.

¹⁰⁰ Ibid, pp. 9-10.

¹⁰¹ See Mark Stokes and Ian Easton, "Evolving Aerospace Trends In the Asia-Pacific Region: Implications for Stability in the Taiwan Strait and Beyond," *Project 2049 Institute Occasional Paper*, May 27, 2010, pp. 36-38, at http://www.project2049.net/documents/aerospace_trends_asia_pacific_region_stokes_easton.pdf.

¹⁰² For an excellent discussion on what this would mean for the U.S. Army, see Jim Thomas, "Why the U.S. Army Needs Missiles: A New Mission to Save the Service," *Foreign Affairs*, May/June 2013, pp. 137-144, available online at <http://www.csbaonline.org/2013/04/22/why-the-u-s-army-needs-missiles-a-new-mission-to-save-the-service/>. For a more detailed discussion of why China's first-strike weapons should compel the U.S. to suspend its INF Treaty obligations until China can be included in the framework, see Mark Stokes and Ian Easton, "Evolving Aerospace Trends In the Asia-Pacific Region: Implications for Stability in the Taiwan Strait and Beyond," *Project 2049 Institute Occasional Paper*, May 27, 2010, pp. 36-38, at http://www.project2049.net/documents/aerospace_trends_asia_pacific_region_stokes_easton.pdf; Mark Stokes and Dan Blumenthal, "Can a Treaty Contain China's Missiles?" *Washington Post*, January 2, 2011, at <http://www.washingtonpost.com/wp-dyn/content/article/2010/12/31/AR2010123104108.html>; John R. Bolton and Paula A. Desutter, "A Cold war Treaty That's Doing Us Harm," *Wall Street Journal*, August 15, 2011, at <http://online.wsj.com/article/SB10001424053111903918104576500273389091098.html>; and David W.



Kearns, *Facing the Missile Challenge: U.S. Strategy and the Future of the INF Treaty* (Arlington, VA: RAND Corporation, 2012), at <http://www.rand.org/pubs/monographs/MG1181.html>.

¹⁰³ Ibid.