THE PLA BEYOND BORDERS

Chinese Military Operations in Regional and Global Context

Edited by

Joel Wuthnow, Arthur S. Ding, Phillip C. Saunders,
Andrew Scobell, Andrew N.D. Yang

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National Defense University Press
Washington, D.C.
2021

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Library of Congress Control Number: 2021935171
ISBN: 978-0-9968249-7-2 (paperback)

National Defense University Press
300 Fifth Avenue (Building 62), Suite 212
Fort Lesley J. McNair
Washington, DC 20319

NDU Press publications are sold by the U.S. Government Publishing Office. For ordering information, call (202) 512-1800 or write to the Superintendent of Documents, U.S. Government Publishing Office, Washington, DC 20402. For GPO publications online, access its Web site at: http://bookstore.gpo.gov.

Book design by John Mitrione, U.S. Government Publishing Office

Cover image: Commissioning ceremony of China's first domestically built aircraft carrier, *Shandong* (Hull 17), takes place at naval base in Sanya, in Hainan Province, China, December 17, 2019 (Li Gang/Xinhua/Alamy Live News)

CONTENTS

Acknowledgments vii

Introduction
THE PLA BEYOND BORDERS
Joel Wuthnow 1

Part I: Enabling Operations: Capabilities, Infrastructure, and Organizations

1 The PLA's Expeditionary Force: Current Capabilities and Future Trends
Kristen Gunness 23

2 Crossing the Strait: Recent Trends in PLA 'Strategic Delivery' Capabilities
Chung Chieh and Andrew N.D. Yang 51

3 China's Overseas Base, Places, and Far Seas Logistics
Isaac B. Kardon 73

4 PLA Command and Control of Overseas Operations
Phillip C. Saunders 107

5 China's Air and Maritime ISR in Coastal Defense and Near Seas Operations
Shinji Yamaguchi 127

6 The PLA Strategic Support Force: A "Joint" Force for Information Operations
John Chen, Joe McReynolds, and Kieran Green 151

Part II: Into Action: PLA Operational Concepts and Practice

7 Reassessing China's Use of Military Force
Andrew Scobell 183

8 Bomber Strike Packages with Chinese Characteristics
Nathan Beauchamp-Mustafaga 199

9 PLA Operational Lessons from UN Peacekeeping
Joel Wuthnow 235

10 China's Security Assistance in Global Competition: The Case of Africa
Jonah Victor 263

11 A New Type of Cross-Border Attack: The PLA's Cyber Force
Ying-Yu Lin 295

12 Space and Chinese National Security: China's Continuing Great Leap Upward
Dean Cheng 311

About the Contributors 339

Index 345

ACKNOWLEDGMENTS

This volume is the most recent product of a longstanding annual conference series on the People's Liberation Army jointly sponsored by the U.S. National Defense University (NDU), the RAND Corporation, and Taiwan's Council of Advanced Policy Studies (CAPS). The editors are grateful to the leaders of their institutions for their continued support, including NDU presidents Vice Admiral Frederick J. Roegge and Lieutenant General Michael T. Plehn, NDU Institute for National Strategic Studies director Laura Junor and acting director Denise Natali, RAND president Michael Rich, and CAPS secretary-general Andrew Yang.

It takes hard work by many people to make these conferences and this publication possible. We would like to acknowledge, in particular, Mark Cozad and Derek Grossman from RAND, and Yi-Su Yang and Polly Shen from CAPS. At NDU, Catherine Reese went to heroic lengths to get service contracts and travel approved and honoria paid.

Most chapters in this volume were originally presented at the 2019 conference, which was held in Taipei. For helpful feedback during and after the conference, the editors thank the participants and discussants, including Cortez Cooper, Arthur Ding, T.X. Hammes, Scott Harold, Alexander Huang, Taiho Kim, Ma Chengkun, Bonny Lin, and Mark Stokes. Chapter 6, by Nathan Beauchamp-Mustafaga, was presented at the 2018 conference in Washington, DC, and benefited from feedback from Lonnie Henley and Jackie Newmeyer Deal.

NDU Press, which has published several previous books from this conference series, once again worked tirelessly to bring this volume across the finish

line. Special thanks go to director William T. Eliason, executive editor Jeffrey D. Smotherman, and senior editor John J. Church. Lisa Yambrick, an independent contractor, copyedited the text. Susan Carroll did the first round of proofreading and indexed the book. At GPO Creative Services, John Mitrione designed the book. William Eliason and Joanna Seich worked with Cameron Morse and others at the OSD Security Review Office to obtain clearance for publication.

The editors thank the following individuals for assistance with proofreading: Samantha Arnett, Alex Barker, Josh Baughman, Paul J. David-Albert, Jerry Epstein, T.X. Hammes, Jackie Kerr, Eric Kingsepp, Thomas F. Lynch III, Lieutenant Colonel Patrick McClintock, USAF, Amy Nelson, Austine Rawllins, Shane Smith, Brett Swaney, and Cynthia Watson.

INTRODUCTION

THE PLA BEYOND BORDERS

By Joel Wuthnow

The past decade has witnessed a series of "firsts" in China's demonstrated ability to deploy military units of various sizes and types far from its own borders. In September 2012, the People's Liberation Army (PLA) Navy commissioned its first aircraft carrier, the *Liaoning*, a ship that made its maiden voyage into the Western Pacific in December 2016.[1] In September 2013, a PLA naval aviation H-6 bomber flew past the First Island Chain for the first time, while the air force began sending its H-6K variant on overwater training missions in March 2015, including some that circumnavigated Taiwan.[2] The Chinese ground forces, which had been contributing noncombat troops to United Nations (UN) peacekeeping missions since the late 1980s, deployed their first infantry battalion to a UN mission, in South Sudan, in February 2015.[3] On August 1, 2017—the PLA's 90th anniversary—China opened its first overseas military base, in Djibouti, manned by a mechanized marine company.[4] In December 2019, the navy commissioned its first domestically built carrier, the *Shandong*.[5]

These examples represent only a few milestones in the increasing range and pace of Chinese overseas military operations. For most of its existence, the PLA was primarily responsible for internal stability and border defense

missions, with units rarely venturing far beyond the mainland. In the 1980s, many of the PLA's domestic security functions were transferred to paramilitary and law enforcement forces, allowing it to focus more on external missions. Since the 1990s, China's expanding global economic interests, growing reliance on overseas supply routes to fuel its domestic growth, ratcheting up of territorial disputes in the South and East China seas, and desire to extend its security frontier outward to delay or defeat U.S. intervention in a regional crisis gave rise to a more ambitious vision of how the PLA should be used abroad to support the interests of the nation and those of the Chinese Communist Party. These changes also stimulated the development of more capable power projection platforms. The operational imperative to more regularly operate overseas was enshrined in Hu Jintao's 2004 "new historic missions" and has persisted in China's military strategy in Xi Jinping's era.[6]

China's increasing pattern of military activities abroad raises a number of questions: What goals are the Chinese Communist Party, the PLA, and different bureaucracies within the PLA pursuing in these operations? What explanations best account for different types of operations and activities? In the context of the PLA's recent restructuring, how are new or realigned organizations, such as the theater commands, the Strategic Support Force (SSF), and the Joint Logistic Support Force, intended to support overseas operations? How will China sustain expeditionary forces for long periods without an extensive network of dedicated military bases? What are the primary challenges, in terms of hardware, human capital, political, or other factors, that complicate China's ability or willingness to project military power beyond its borders? What are the implications for China's neighbors, the United States, and the international community?

Many recent studies have addressed one or more of these questions, generally through interpretive assessments of PLA doctrine and capabilities, case studies of specific contingencies or recent operations, or portraits of key PLA organizations.[7] Those studies have typically focused on Chinese operations within the Indo-Pacific region, covering the PLA's involvement in border conflicts, "gray zone" operations in regional disputes, preparations for a conflict with Taiwan, and counterintervention capabilities and missions directed at the United States.[8] In recent years, there has also been increasing attention to China's military footprint outside of Asia, including discussions of the PLA's

expeditionary capabilities, nontraditional security operations, military diplomacy, and security assistance.[9]

This volume seeks to combine these themes into a broad survey of Chinese military operations within and beyond Asia. The chapters, written by specialists from the United States, Taiwan, and Japan, were originally presented at the 2019 iteration of the annual conference on the PLA organized by the U.S. National Defense University, the RAND Corporation, and Taiwan's Council on Advanced Policy Studies, held in Taipei in November of that year.[10] The contributors were asked to examine recent trends in PLA operations abroad, focusing on innovations such as the development of Chinese-operated ports and the role of the SSF; high-profile issues, including PLA activities in the Taiwan Strait and the South and East China seas; and military diplomacy in key regions. All of the chapters draw from original Chinese sources, some of them using new or underutilized PLA writings. This introduction provides a general overview of the topics examined in this volume, key themes, and an outline of the rest of the book.

Thinking About PLA Operations

The PLA's increasing regional and global operations can be analyzed on two levels. First is the development of capabilities, infrastructure, and supporting systems that enable overseas operations and help to define the limits on what the PLA can accomplish overseas. Kristen Gunness's chapter provides an overview of China's evolving inventory of power projection capabilities by service. As of early 2021, these assets include a large number of submarines and "blue water" surface vessels; seven marine corps brigades; two dozen long-range transport aircraft, including the new indigenous Y-20; five combined arms brigades within the air force's airborne corps; and various mobile army units, including amphibious brigades, special operations forces, and peacekeepers. As part of successive rounds of reforms, many of these units have been expanded or restructured to better meet mission requirements; examples include the shift of most army and air force divisions to a more flexible brigade structure and the growth of the PLA Navy Marine Corps.[11]

Complementing those operational forces is an array of intelligence, surveillance, and reconnaissance (ISR) systems. These assets have expanded as the range and complexity of PLA missions have grown. In his chapter, Shinji

Yamaguchi notes that China has sought to better integrate its military and civilian ISR capabilities and operations in the "near seas" to overcome the limitations of ground-based radar coverage. Aside from traditional ISR systems, China is also increasingly relying on space and cyber assets, introducing new capabilities (and new vulnerabilities). For instance, synthetic aperture radar satellites operated by the SSF provide targeting data crucial for strikes on U.S. surface ships in the Western Pacific.[12] As Ying-Yu Lin discusses in his chapter, cyberattacks may also be useful in generating a common picture of adversary systems that would enable more effective offensive strikes in a conflict.

Capabilities involve not only physical assets, but also the human capital needed to plan and conduct overseas operations.[13] Cultivating those skills can involve various forms of professional development. First is a professional military education system that provides instruction on foreign operating environments, foreign adversaries and partners, and foreign languages and cultures. Second is domestic training that can offer PLA units opportunities to simulate overseas missions—one example being a peacekeeping training center where Chinese and foreign forces practice scenarios related to UN peacekeeping operations. Third is exercises with other states, both in China and overseas, which require Chinese officers to utilize foreign language skills and develop the ability to operate effectively alongside other militaries. Fourth is real-world operations, such as antipiracy operations in the Gulf of Aden and UN peacekeeping, which can give PLA officers exposure to foreign terrain or foreign populations and might even expose them to dangerous or unpredictable situations.

China's evolving logistics system is another critical enabler. The navy previously practiced a "bring it with you" logistics model, but it has increasingly relied on a network of civilian ports, many of them built and operated by Chinese companies, to perform resupply functions.[14] The inaugural base in Djibouti could be the first in a series of what Chinese military theorists call "strategic strongpoints"—logistics hubs that would be vital in sustaining deployed forces in distant theaters.[15] Closer to home, China has improved existing facilities and built new outposts in the South China Sea. The most notable recent development has been the construction of runways and ports on reclaimed land in the Spratlys, complemented by an assortment of weapons systems, which the U.S. Defense Department assesses will permit a "more flexible and persistent

military and paramilitary presence in these areas."[16] As Chung Chieh and Andrew Yang discuss in their chapter, the PLA has also been establishing a system of "strategic delivery" bases within China to support overseas missions.[17]

Command and control systems also support various types of overseas operations. A key innovation completed during the Xi era is the creation of a modern joint command system with decisionmaking nodes at the Central Military Commission (CMC) and theater levels. The CMC's Joint Staff Department has an Overseas Operations Office that helps to manage global deployments, though, as Phillip Saunders discusses in his chapter, the service headquarters continue to be influential, and further reforms would be needed to oversee joint combat missions in distant locations. Commanders of the PLA's five theater commands have authority over conventional forces in their respective areas, allowing the PLA to more effectively utilize joint forces within the Indo-Pacific region. However, some important questions remain about this system, such as the relationship between the theaters and the SSF. John Chen, Joe McReynolds, and Kieran Green offer a new perspective on that issue in their chapter.

A second focus of analysis is on the operations themselves, including operational concepts, contingency plans, training missions, and real-world operations and activities. Drawing from foreign experiences and China's own unique characteristics, PLA theorists have periodically redefined how military power should be used in regional conflicts and noncombat missions.[18] Core concepts include a priority on joint operations, the incorporation of advanced information systems, and—more relevant to combat missions—a notion of "system of systems" confrontation, in which outcomes are determined by the relative effectiveness of the opponents' overall military structure.[19] More granular concepts have been developed for various missions. For instance, Dean Cheng's chapter describes an evolution in PLA doctrine for space operations in the first two decades of the 21st century, with a greater emphasis on offensive strikes. As explored in a previous volume in this series, theoretical expositions have been accompanied by more concrete plans for a range of scenarios.[20]

While the PLA has not translated doctrine into actual warfighting since 1979, all of the PLA's services have conducted routine deployments at increasing distances from China. Most active in this respect is China's blue water navy.

Within Asia, the navy has maintained a more regular presence throughout the South China Sea since 2008, reflecting Beijing's activist approach to territorial disputes in the latter part of the Hu era and the Xi era, and in the East China Sea following Japan's nationalization of the Senkaku Islands in September 2012.[21] With its expanded focus on territorial "rights enforcement," the navy has been involved in a series of dangerous incidents with other territorial rivals and U.S. naval forces, prompting Beijing to agree to conventions such as the Code for Unplanned Encounters at Sea to reduce the chances of unintended escalation. More often, however, the navy has been employed over the horizon, with the "white hull" ships of the China Coast Guard and the People's Armed Forces Maritime Militia on the front lines of these disputes.[22]

In the 2000s and 2010s, the navy also frequently deployed surface ships and submarines into the Indian Ocean, the Western Pacific, and even areas farther afield such as the Eastern Mediterranean.[23] These deployments reflected a shift in doctrine from a preoccupation with defending China's interests in the near seas to a stronger focus on "far seas" protection, encompassing traditional missions such as sea lane protection and nontraditional security activities.[24] A hallmark was China's antipiracy operations in the Gulf of Aden, which commenced in December 2008 as a response to growing threats to Chinese shipping and U.S. efforts to persuade China to contribute more to international public goods. Since then, more than 30 escort task forces have transited from China to the Middle East to support those operations.[25] Reflecting their role in military diplomacy, those ships have often conducted port calls and small-scale bilateral exercises on their return voyages; China's hospital ship, the *Peace Ark*, has also routinely conducted medical missions in the far seas.[26] The navy has also supported contingencies such as the evacuation of civilians from Libya (2011) and Yemen (2015) and the search for the missing Malaysian Airlines Flight 370 (2014).

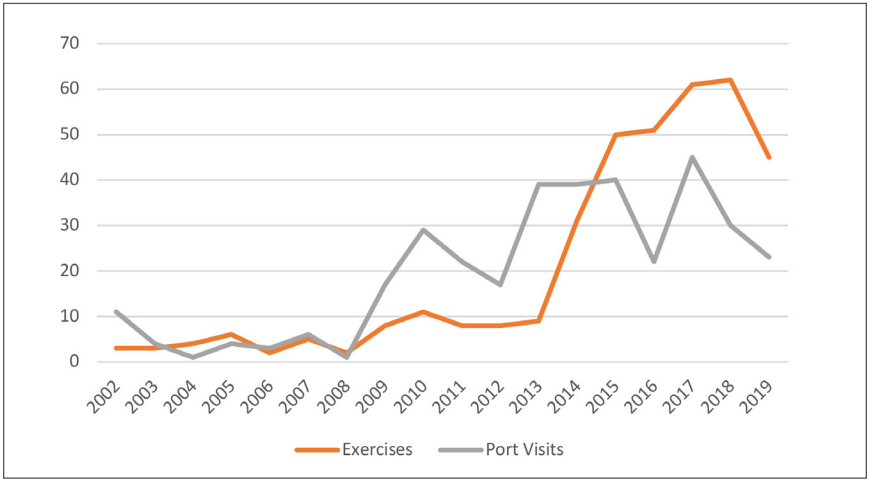
The air force was traditionally assigned a territorial air defense mission but has become increasingly active in patrolling outside China's borders. One milestone was the declaration of an Air Defense Identification Zone (ADIZ) in the East China Sea in November 2013. The air force was not able to fully enforce the ADIZ, but its activities over the sea led Japan to frequently scramble interceptors.[27] Moreover, since 2015, the air force has been conducting regular overwater bomber operations, following earlier operations by naval

aviation. As Nathan Beauchamp-Mustafaga documents in his chapter, some of these flights have circumnavigated Taiwan for signaling purposes and to provide practical training for Chinese pilots, while others have continued into the Western Pacific.[28] The air force has also conducted periodic combat air patrols in the South China Sea since July 2016, underscoring China's resolve to defend its territorial claims following a UN arbitration panel's ruling invalidating China's claims within the nine-dash line.[29]

Various other components of the Chinese armed forces are also active abroad. The ground forces continue to operate mainly within China's borders, but they occasionally take part in amphibious exercises off the coast and annually deploy around 2,500 personnel to UN peacekeeping missions, including a small number of infantry in South Sudan and Mali.[30] The marines, which fall under the navy, have staged amphibious exercises in the South China Sea and operate China's base in Djibouti. Even the People's Armed Police, which is mainly preoccupied with domestic security, has established a footprint in neighboring Tajikistan, where it reportedly conducts counterterrorism operations.[31] The SSF has a global portfolio in multiple respects: its subordinate cyber units have penetrated information systems in many countries, often to steal technical data or exploit enemy vulnerabilities that could be leveraged in combat,[32] while SSF-operated satellites provide global navigation, communication, and other services.

Navy, army, and air force units have also participated in foreign exercises. Many of these are low-key events designed to support China's diplomatic relations, but some are more combat-oriented. Among the most complex exercises are China-Russia naval drills, which have included training in areas such as air defense, at-sea replenishment, and antisubmarine warfare.[33] The two countries have also cooperated in other areas. In August 2018, for instance, 3,200 Chinese troops from the Northern Theater Command traveled to the Russian Far East to participate in the Vostok exercise, Russia's largest since the fall of the Soviet Union.[34] China and Russia are the prime participants in the annual Peace Mission exercises organized under the Shanghai Cooperation Organization. Despite that group's focus on counterterrorism, recent exercises have often involved advanced weapons and complex warfighting scenarios.[35] The figure depicts both overall bilateral and multilateral exercises and naval port visits from 2002 to 2019.

Figure. Chinese Foreign Exercises and Port Visits, 2002–2019



Source: U.S. NDU Military Diplomacy Database

Rounding out a discussion of Chinese military activities in the field are security assistance programs and initiatives. These include construction of military infrastructure, collaborative professional military education programs, and arms sales. Indeed, in 2020, China surpassed Russia to become the world's second-largest arms exporter, according to one estimate.[36] Jonah Victor's chapter demonstrates how China has become more active in each of these areas across the African continent, gaining some advantages over more traditional Western security assistance partners though continuing to lag behind in other areas.

Key Themes

In analyzing the characteristics, drivers, and challenges of China's overseas operations, a number of themes emerge in this volume. First is the relevance of civilian support for military operations. Historically, China's civilian and military spheres have been quite distinct, separated by bureaucratic stovepipes and diverging interests and responsibilities. However, both the Hu and Xi administrations have encouraged synergies between the two sectors, discussing this objective under the label of *civil-military integration* (sometimes also rendered as *military-civilian fusion*). This term often refers to civilian inputs to the development of military technology, but there are also several

ways in which Chinese civilian actors are supporting the PLA's operational requirements.[37] Examples include the following:

- Reliance on the China Coast Guard (which has recently been placed under military authority but continues to perform civilian maritime law enforcement functions) and the Maritime Militia for ISR data in the near seas.
- The construction of certain classes of civilian ships and aircraft to military specifications. For instance, Chinese regulations stipulate that civilian cargo planes need to be able to handle military cargo requirements. This provides a wider range of capabilities that can be leveraged for military purposes at reduced cost.
- The development of civilian transportation infrastructure, such as railways, ports, and airports, to military standards. As Isaac Kardon explains in his chapter, foreign ports constructed by Chinese contractors are meticulously designed to be able to handle PLA naval vessels, strengthening the PLA's overseas logistics network.
- The fielding of part-time cyber militias drawn from the larger society and recruitment of cyber experts for key positions in the SSF.

A second theme is increasing "jointness" within the PLA. As with the civilian-military divide, cooperation between the PLA's services has traditionally been limited. However, concluding that modern battlefield success depends on the services working effectively in tandem, Chinese military leaders have placed increasing emphasis on joint warfare over the past 30 years, with incremental progress in the development of joint doctrine, joint training, and the cultivation of a cadre of officers able to plan and coordinate joint operations.[38] As noted above, an important shift under Xi has been the creation of a joint command system. Unlike the pre-reform system, in which the authority of the military region commanders in peacetime did not extend beyond the ground forces, theater commanders are able to organize joint exercises in peacetime and exercise authority over forces drawn from multiple services in a crisis.

Several chapters explain how improving jointness is leading to more effective PLA operations. Shinji Yamaguchi, for instance, documents how technical specialists in each of the theaters are responsible for integrating

intelligence derived from platforms belonging to the different services, promoting a common operational picture in the maritime domain. Chung Chieh and Andrew Yang show how progress in the PLA's joint logistics system, including the establishment of an interlocking system of rear area and front-line logistics bases, is improving the PLA's ability to plan and conduct amphibious operations across the Taiwan Strait. Dean Cheng explains how China's evolving concepts of space operations, from information support to defensive and offensive operations, contribute to joint campaigns.

A third theme is the salience of shaping the security environment as a key driver of PLA operations and activities abroad. A complete accounting of Chinese overseas operations requires reference to an extensive set of motivating factors, which are not mutually exclusive, including China's desire for recognition as a global military power and accumulation of status symbols, such as aircraft carriers; protection of overseas interests, ranging from maritime territorial claims to overseas property and personnel; bureaucratic rivalries in a constrained budget environment, which have led both the army and air force to posture themselves as "power projection" services with important overseas missions, competing with the navy for scarce resources;[39] and profit motives, which remain a primary objective of China's arms sales.[40]

Nevertheless, many of the operations analyzed in this volume emphasize another driver: the Chinese leadership's desire to use military means to reshape the regional and global security environment in China's favor. Chinese doctrine does not clearly delineate a "shaping" objective similar to what the U.S. military refers to as "Phase 0" operations.[41] Nevertheless, successive defense white papers make clear that the PLA should influence the choices of other states through a combination of deterrence and military diplomacy. The first goal involves demonstrating military power in ways that intimidate rivals and lead them to accept an aspect of China's political agenda that they otherwise would have opposed. Nathan Beauchamp-Mustafaga interprets China's long-range bomber flights as a form of deterrence signaling targeted at China's smaller South China Sea rivals and the Taiwanese public, while Ying-Yu Lin shows that Beijing has also used misinformation spread through cyber means to shape public opinion in Taiwan. Dean Cheng argues that development and displays of counterspace capabilities are part of a larger deterrent program focused on China's rivals.

Another role of shaping is to co-opt foreign audiences and elites through friendly gestures involving military capabilities and security assistance. For example, Phillip Saunders suggests that the PLA's provision of public goods through UN peacekeeping operations, counterpiracy deployments, and humanitarian assistance/disaster relief operations promotes a more positive image of China and buttresses relations with key states. Through the lens of Africa, Jonah Victor demonstrates that Beijing is selectively doling out security assistance to solidify relations with partners such as Nigeria, Sudan, and Kenya and to develop comparative advantages in a contest for influence on the continent between China and the Western powers.

A fourth theme is the depiction of technical and human capital constraints on the scope and effectiveness of China's overseas operations. Contributors to this volume highlight a range of deficiencies that continue to hinder the PLA, including insufficient air and sea lift for a Taiwan invasion, compounded by budgets that are growing at slower rates than in the 1990s and 2000s; inadequate defenses for China's overseas strategic strongpoints, which reduces their potential utility in supporting expeditionary combat operations; the lack of a comprehensive global command and control structure, which would be needed to undertake large-scale joint operations outside the Indo-Pacific region; China's lack of formal allies, which reduces its attractiveness as a security partner in relation to the United States; the PLA's increasing reliance on satellites for a range of support functions, which enable some operations but also introduce vulnerabilities that could be exploited in wartime; and tensions between the PLA's regional missions and global ambitions, which tend to reduce the capabilities available for the latter.[42]

The most common observation, however, is that the PLA's prospects are limited by the quality and expertise of its own personnel.[43] Shinji Yamaguchi, for instance, argues that inadequate technical expertise is a problem in strengthening intelligence integration functions within the theaters. Nathan Beauchamp-Mustafaga notes that limited training hours have constrained the proficiency of China's bomber pilots relative to their U.S. counterparts. Joel Wuthnow points out that the recent incidence of casualty aversion in UN peacekeeping missions reduces the PLA's ability to test officers' capabilities in combat-like situations. Ying-Yu Lin describes weaknesses in attracting qualified cyber operators given competition from

private companies and a military lifestyle that does not align well with the preferences of hackers.

The final theme is that China's operations abroad will pose challenges that the United States and its allies and partners will have to address in the coming years. There has been widespread discussion in foreign circles about China's military "assertiveness" in the region and the need for adaptation from other states.[44] Chapters in this volume from Taiwan and Japanese contributors highlight specific challenges from a regional perspective. The chapters by Chung Chieh and Andrew Yang, and by Ying-Yu Lin, describe a growing PLA threat to Taiwan that will require updated defenses and cooperation between Taiwan and the United States. Shinji Yamaguchi portrays China's evolving ISR systems in the South and East China seas as producing a more complex operating environment for other naval forces in the near seas. This will require new approaches to targeting Chinese systems during a conflict, and more thinking on how Washington and Tokyo can collaborate to reduce the threat.

Chinese military operations outside Asia are usually construed as less problematic for, or even conducive to, peace and stability because they currently focus on "military operations other than war." Nevertheless, authors in this volume describe potential challenges for the United States and the larger international community as China's military power goes global. Isaac Kardon suggests that China's operation of dual-use ports will grant Beijing leverage over host governments that could degrade U.S. security partnerships in the Indian Ocean region and elsewhere. Joel Wuthnow argues that a combination of increasingly combat-focused peacekeeping forces and China's political leverage in the UN Security Council and regional organizations increases China's ability to both justify and conduct interventions to suit its parochial objectives. Kristen Gunness notes that growing expeditionary capabilities will give China more options to use force in distant regions and calls on the United States to encourage Beijing to use those capabilities for positive ends.

Structure of the Book

The remainder of this volume investigates China's military operations in 12 chapters, which are divided into 2 parts. The first part focuses on enablers. In chapter 1, Kristen Gunness chronicles the development of China's expeditionary capabilities, which she argues will remain centered on the navy,

albeit with increasing contributions from the other services. She explains why China is building these capabilities, discusses the range of challenges, and derives the conditions under which future Chinese military engagements abroad are likeliest. The following chapter, by Chung Chieh and Andrew Yang, addresses China's growing capabilities from the narrower prism of an invasion of Taiwan. The authors plumb Chinese sources for indicators of the types and amount of equipment that might be necessary to mount an invasion, review the impressive array of "strategic delivery" capabilities that China has already built for this purpose, and argue that the remaining gaps provide Taiwan a window of opportunity to improve its defenses.

In chapter 3, Isaac Kardon assesses Chinese discussions about future logistics requirements for military operations far beyond China. He finds widespread support for a "strategic strongpoint" model of logistics hubs and civilian ports built to military specifications, with fewer indications that China intends to follow a traditional basing network along the lines of the U.S. postwar structure. This model would support many of China's current far seas missions, such as antipiracy, peacekeeping, and protection of vital sea lanes, but is less well suited to high-end combat missions because those facilities typically lack strong defenses and require political consent from host nations, none of whom have alliance commitments from China.[45]

In the next chapter, Phillip Saunders surveys how the postreform command structure has been organized to handle a variety of missions, including border contingencies, near seas operations, complex regional scenarios involving more than a single theater command, far seas operations, and military diplomatic activities. The system is well designed to supervise operations around China's borders, but unclear authorities and bureaucratic tensions raise questions about how well Beijing can manage higher end missions outside the responsibility of the theater commands. Saunders sketches several alternative structures that the PLA may adopt as its requirements in the far seas become more demanding.

The following chapters cover recent developments in China's ISR systems. Chapter 5, by Shinji Yamaguchi, investigates two trends in China's near seas ISR: the integration of information through the theater commands and cooperation between military and civilian agencies. Yamaguchi assesses these developments through case studies of recent PLA operations in the East and

South China seas. The next chapter, by John Chen, Joe McReynolds, and Kieran Green, draws on newly available PLA sources to examine the relationships between the SSF and three actors: civilian agencies that provide policy guidance; joint commanders at the national and theater levels, who will incorporate SSF assets into future operations; and the other services that coordinate with the SSF. The authors conclude that the SSF could be a "force multiplier" for future far seas operations and will increase the ability of PLA joint commanders to conduct high-intensity operations in regional conflicts.

The second part of the book turns to Chinese operations from the perspective of theory and practice. Chapter 7, by Andrew Scobell, identifies the key dimensions of China's use of armed force, which he defines to include both coercive actions and military diplomacy. He argues that the PLA's employment of military power has shifted from "blunt and basic" to "sharp and sophisticated," with a larger range of capabilities available to support an expanded set of national interests. This has involved a geographic shift in focus from China's continental frontiers to its maritime periphery and beyond. Scobell suggests that Beijing has tried to avoid a costly confrontation with the United States or others but, by adopting a strategy of assertive gray zone coercion in its territorial disputes, has accepted risks of a crisis escalating beyond its control. He also contends that China's "hard" military power is a key part of its "soft power" diplomacy in other regions.

In Chapter 8, Nathan Beauchamp-Mustafaga dives deeply into Chinese air force overwater bomber training flights. These operations are a linchpin of China's development of a "strategic air force" that can conduct offshore missions for deterrent and warfighting purposes, and provide valuable training for Chinese pilots to simulate raids on key targets. By leveraging a mix of PLA doctrinal publications and publicly reported flight details, Beauchamp-Mustafaga's chapter discusses PLA concepts of "bomber strike packages" and traces their evolution in practice. He concludes with a discussion of how these operations may evolve in the future and the challenges that the PLA will face as it sharpens its expeditionary air power.

The following two chapters explore PLA operations beyond Asia. Chapter 9, by Joel Wuthnow, assesses the PLA's participation in UN peacekeeping missions and its contributions to a new UN peacekeeping standby force. He finds that Beijing has derived a number of operational lessons from these

engagements, including learning from foreign troop contributors, developing foreign language and cultural skills, and gaining external validation for PLA readiness. In the next chapter, Jonah Victor analyzes China's approach to security assistance in Africa. Through a statistical analysis, he finds that the recipients of Chinese assistance are closely associated with China's strategic partnerships and major arms markets. He also weighs China's comparative advantages and disadvantages as a security partner vis-à-vis Western providers, arguing that it is vital to take the agency of recipient states seriously.

Shifting away from a geographic focus, the book concludes with an examination of Chinese operations in the "information" domain. In Chapter 11, Ying-Yu Lin analyzes Chinese cyberattacks against Taiwan. His chapter reviews PLA concepts of cyber warfare, discusses recent organizational changes, and outlines three types of ongoing cyber operations: intelligence collection, targeting of critical infrastructure, and spreading misinformation. He suggests that human capital problems and lack of effective coordination between SSF and civilian agencies could pose obstacles. In the final chapter, Dean Cheng draws from PLA doctrinal writings to explain the roles that China's space and counterspace capabilities are intended to play in supporting joint operations and other missions. As an example of military-civilian fusion, he also discusses the potential dividends of China's lunar program for PLA space capabilities.

Conclusion

In sum, the volume describes the growing frequency, complexity, and proficiency of Chinese military operations in the first two decades of the 21st century, built on a foundation of material and human capabilities, infrastructure, and other supporting systems. The pattern of activities, in some ways, justifies growing concerns about China's use of military power to intimidate weaker neighbors and prevent U.S. forces from operating freely within the region, but in other cases highlights routine missions that any major country with the requisite abilities would conduct to safeguard its national interests.[46]

Looking ahead, China's development of expeditionary capabilities and its portfolio of operational missions could follow several trajectories. A linear path would involve the introduction of additional power projection platforms, such as the H-20 bomber, several more domestically produced aircraft carriers, and a fleet of strategic transport aircraft, supported by overseas bases in places such

as Pakistan and Cambodia and performing similar missions: deterrence of the United States and regional adversaries; enforcement of territorial claims; protection of overseas interests; and enhanced provision of public goods such as peacekeeping, counterpiracy, and humanitarian assistance/disaster relief to try to assure wary regional and global audiences. The Sino-U.S. strategic rivalry, which has been accelerating in recent years, could also push China to upgrade its counterintervention capabilities and deterrence signaling targeted at Washington and to be more aggressive in courting friends in the region through security assistance and military diplomacy.[47] On this path, China would still be limited by human capital, budgetary, and political constraints.

However, other possibilities could also be envisioned.[48] One would be an emulation of a U.S.-style model of overseas bases, large-scale foreign deployments, and combat missions on other continents and in distant seas. This would require a reallocation of combat forces beyond Asia, an opening of major U.S.-style bases (in contrast to the current "strategic strongpoint" model), and the creation of a more cohesive global command and control system. There are few indications in China's discourse on becoming a "world-class military" by mid-century that this scenario is, in fact, a long-term ambition.[49] Nevertheless, several changes could push China toward such an outcome, including the creation of formal alliances, which has been discussed in some Chinese circles;[50] resolution of near seas problems such as the Taiwan issue that would allow more resources to be shifted to other theaters; or growing threats to China's overseas interests that can only, or best, be handled through military means.

It is also conceivable, though even less likely, that China could turn inward, scaling back its overseas presence and operations. Given the fundamental interests—both material and in terms of bureaucratic incentives—promoting increasing overseas operations and security assistance, such a turn of events would be likely only given a domestic or external shock, such as a transition to a regime with other priorities, domestic instability requiring the party's full attention, an economic downturn leading to less military spending (which has not been the case even as China in early 2021 continues to grapple with the effects of a global pandemic), or a reconfiguration of the global political structure. In the absence of such dramatic circumstances, other states will need to decide how to encourage China to use its military instrument in responsible ways on the global stage and to determine how aggression within the region can be blunted.

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Enabling Operations: Capabilities, Infrastructure, and Organizations

CHAPTER 1

The PLA's Expeditionary Force: Capabilities and Trends

By Kristen Gunness

Over the past decade, Beijing has increasingly focused on developing an expeditionary military capability to secure China's expanding interests beyond East Asia. Those interests include protecting the millions of Chinese citizens living abroad, preserving access to energy resources, protecting economic investments, and securing critical shipping lanes. Although such expeditionary operations have been relatively limited to date, the Chinese People's Liberation Army (PLA) is steadily improving its ability to operate beyond China's borders and has engaged in humanitarian assistance and disaster relief (HA/DR), noncombatant evacuation operations (NEOs), counterpiracy operations, and peacekeeping missions. Furthermore, as China's military footprint grows, so do the infrastructure and logistic capabilities required to support a more permanent PLA presence overseas. This chapter examines the development of PLA expeditionary forces and assesses five questions:

- What is driving China's expanding military footprint?
- Which threats does the PLA assess it is most likely to face overseas?
- What are the PLA's current expeditionary capabilities?

- What challenges does the PLA face in fielding expeditionary forces?
- Under what conditions will China most likely conduct expeditionary operations?

The answers to these five questions suggest that the PLA will focus on developing expeditionary forces in the maritime domain with supporting ground, air force, and space-based capabilities. They also suggest that overseas deployments are likeliest under five conditions: when domestic or international expectations pressure Beijing to act; when Chinese interests are directly threatened; when PLA presence can help build China's influence and military ties with host governments; when the PLA can gain overseas deployment experience and training while contributing to international security missions; and when the PLA's expeditionary capabilities are mature enough to accomplish the mission and other options, such as free-riding on other countries' capabilities, are insufficient.

The chapter is organized into five sections. The first section briefly discusses PLA definitions of the *expeditionary* concept. The second examines the key drivers of PLA expeditionary capabilities. The third and fourth sections discuss potential overseas security threats and the expeditionary capabilities that the PLA currently can leverage to address these threats, respectively. The fifth section addresses the gaps in China's expeditionary capabilities. The conclusion considers the conditions under which the PLA might deploy overseas in the future.

How the PLA Defines *Expeditionary*

The PLA's definition of *expeditionary* is somewhat different from the U.S. definition, and it is evolving as the debate in Beijing continues about how to approach overseas operations. Even in the U.S. military, the definition of *expeditionary* varies by organization and service. The U.S. Army, for example, defines *expeditionary capabilities* as "the ability to promptly deploy combined arms forces world-wide into any area of operation and conduct operations on arrival. The operations require the ability to deploy quickly, rapidly shape conditions, and exploit success and consolidate tactical and operational gains."[1] Meanwhile, Joint Publication 1-2 defines an *expeditionary force* as an "armed force organized to achieve a specific objective in a foreign country."[2]

The PLA's definition differs from both of these U.S. concepts. The 2011 PLA dictionary defines *strategic delivery* [*zhanlüe tousong*, 战略投送], the closest term to *expeditionary*, as "the comprehensive use of all types of military transportation and units to deliver military power to a combat or crisis situation for the purposes of achieving a strategic objective."[3] The term contains several clues to Chinese thinking on expeditionary capabilities. First, it envisions that military power would primarily be used in a crisis or conflict situation, different from the U.S. definition that embraces a much broader range of overseas operations across the peacetime-wartime spectrum. Second, the definition suggests military power should be used to achieve a strategic objective, such as securing economic interests or demonstrating China's military capabilities as a great power. This reflects the inherently political nature of sending PLA forces overseas, particularly given China's longstanding principle of noninterference. Third, the definition encompasses both domestic and international activities, reflecting the many internal and regional challenges China faces over a geographically dispersed area where the PLA might be called on to respond.[4]

By this definition, the PLA expeditionary mission set includes maritime, air, and land operations beyond China's immediate periphery that require delivering military power over long distances to achieve a strategic goal. It also includes operations along China's borders where significant cross-border airlift and sealift capabilities might be used in a crisis or to project power deep into neighboring countries.

There is evidence that as China's global power grows and PLA capabilities improve, Beijing is narrowing the parameters of expeditionary operations beyond the broader concept of strategic delivery to encompass a vision more in line with the U.S. concept, which emphasizes long-distance operations. In a 2017 speech, Ding Laihang, the commander of the PLA Air Force (PLAAF), stated that his service had to become a "strategic delivery airborne unit," capable of projecting power over long distances, though he acknowledged the PLAAF had challenges to overcome before it could truly achieve that goal.[5] China's 2015 defense white paper, "China's Military Strategy," called for the PLA Navy (PLAN) to develop "far seas" protection capabilities, which requires a shift in focus from "offshore waters defense" (defense of China's coastline and regional seas) to the combination of "offshore waters defense" with "open seas protection."[6] The PLA base in Djibouti enables expeditionary missions on a continuous basis,

not just during a crisis. It is therefore likely that the PLA envisions future operations to be more narrowly tailored than its current strategic delivery concept and potentially somewhat closer to U.S. concepts of expeditionary operations.

Drivers of China's Growing Military Footprint

To assess China's future expeditionary capabilities, it is critical to first examine the drivers of China's growing overseas military footprint. This section discusses four key drivers: the expansion of China's overseas interests, Beijing's increasing involvement in international security affairs, pressure on Beijing to be a security provider for the international community, and domestic expectations and increased public support for PLA operations overseas.

The Expansion of China's Overseas Interests

China's overseas interests have steadily increased since the late 1990s, when Jiang Zemin launched his "Going Out" [*zou chuqu*, 走出去] strategy, which encouraged firms to establish offices overseas and explore international markets. Subsequently, the Chinese government in the 2000s provided funding mechanisms to facilitate outward investments, send more Chinese citizens overseas, and diversify China's energy resources around the world.[7] In 2004, Hu Jintao announced the "New Historic Missions," which for the first time officially articulated China's need to develop the capabilities to protect overseas interests and resulted in the PLA's first steps toward developing expeditionary capabilities to support military operations outside of East Asia.[8]

In 2013, Xi Jinping outlined a vision to elevate China's role in the world, referred to as the "China Dream" and "National Rejuvenation."[9] This vision lays out policy objectives to ensure economic prosperity, social stability, and an overall higher quality of life for Chinese citizens. It also contains policy objectives related to expanding the country's national power through modernizing the military to protect China's interests at home and abroad.[10] The China Dream concept undergirds initiatives such as Xi's sweeping Belt and Road Initiative (BRI), which seeks to promote China's economic integration with other regions around the world through investments in infrastructure, transportation, energy, and maritime projects.[11]

Both the China Dream and the BRI have provided the underpinnings for a significant expansion of China's overseas interests. As the BRI evolves,

the potential for overseas security concerns will increase, which in turn will create an operational imperative for the PLA to develop expeditionary capabilities to address current security threats to overseas interests, while also building capabilities for the future when the PLA might have to sustain greater presence overseas for longer periods of time.

Beijing's Increasing Involvement in International Security Affairs

A second motivation behind the PLA's development of expeditionary capabilities is China's growing willingness to use military power to actively shape the security environment in favor of China's interests. Investment in United Nations (UN) peacekeeping operations (PKOs) is one example. China is now the number one contributor of peacekeeping troops to the UN among the 5 permanent Security Council members, with a deployed force of about 2,500 and a standby force of 8,000 soldiers. It is also the number two funder of PKOs, contributing 15 percent of the UN's peacekeeping budget in 2019.[12] China's investment in PKOs allows Beijing to sustain a military presence in areas where it wants to maintain strategic influence and protect interests, such as in energy-rich African countries, while also providing a low-risk way to train PLA troops for future overseas operations. PLA participation in PKOs is also designed to normalize Chinese military presence abroad and support Beijing's narrative that its military is beneficial to international security.

Another example of China's willingness to use the military to shape the international security environment is the opening of the PLAN base in Djibouti, which allows the navy to preposition resources, conduct regular maritime operations, and station a permanent troop presence—currently a contingent of PLA Navy Marine Corps (PLANMC) personnel—on the strategic waterways of the Red Sea, through which China sent $1 trillion in goods in 2018, and the Gulf of Aden.[13] An expansion of PLA counterpiracy operations and patrols in these important waterways would also allow Beijing to rely less on the U.S. Navy's capabilities and more on its own military.

Pressure on Beijing to Be a Security Provider for the International Community

Xi has publicly stated that the military should play a pivotal role in "the maintenance of international security affairs" and try its best to provide more

"public security products to the international community."[14] As China grows as a global power, evidence that the PLA has been providing public goods includes the provision of aid to other nations and their citizens when called on, such as in natural disasters or conflicts. The PLA has so far conducted limited operations to assist foreign nationals abroad, such as with the 2015 NEO in Yemen, where the PLA also brought out other countries' citizens, and HA/DR operations in Haiti, where the PLA sent a contingent of peacekeeping troops to assist residents following the earthquake.[15]

However, China has come under significant criticism by international aid groups, regional governments, international media outlets, and even domestic media such as the nationalist *Global Times* when it has failed to adequately respond to disasters. One example is Beijing's response to Typhoon Haiyan in the Philippines: The United States provided substantial aid while China offered only a small financial donation and sent a relief team.[16] China's willingness to rely on the capabilities of others also led President Barack Obama to critique Beijing as a "free rider" in a global system built by the United States.[17] Though in the past the PLA's lack of expeditionary capabilities hampered China's ability to render aid and provide security to other nations, the PLA now has enough maritime and air capabilities to provide at least limited assistance in the aftermath of a disaster or conflict, and Beijing faces increasing pressure to use those capabilities as China's role in the world grows.

Domestic Expectations and Increased Public Support for PLA Operations Overseas

The Chinese public appears to largely support increased PLA operations overseas. The reasons are twofold. First, the public increasingly expects the government to be able to protect Chinese citizens when an incident occurs overseas, and these expectations create greater pressure on Beijing and the PLA to develop and deploy expeditionary capabilities. The PLA has been caught off guard in past situations where Chinese citizens were in danger, such as when Chinese oil companies were attacked as unrest swept Libya in 2011. In that case, the PLA's lack of expeditionary capabilities forced Beijing to dispatch civilian assets, including charter flights, China COSCO Shipping Company transport ships, and fishing boats, to rescue its citizens.[18] Another incident occurred in Mali in 2015, when 15 People's Republic of China (PRC)

citizens were taken hostage and 3 were killed in a terrorist attack. In the aftermath of the attack, Xi promised the public that Beijing would strengthen China's ability to respond to terrorism abroad—a direct call to the PLA to hone its expeditionary capabilities.[19] Similarly, PRC businessmen were in harm's way when a wave of unrest swept Uganda in 2018, targeting Chinese investments and forcing the Ugandan president to deploy the local military to protect Chinese citizens.[20] As more Chinese citizens move abroad to work on BRI projects, the public expects that the PLA can keep them safe.

Second, a growing segment of the Chinese population appears to support a more proactive military abroad to exert China's influence and achieve its foreign policy goals. There have been several newspaper polls over the past decade asking the public if China should have overseas military bases. These polls generally demonstrate public support for the idea. For example, in a *Huanqiu Shibao* poll in 2009, 89.6 percent of 18,873 respondents answered "yes" to a question on whether China should establish overseas military bases.[21] A survey conducted by a U.S. scholar on the Chinese public's views of China's foreign policy found that the majority of respondents endorsed greater reliance on military strength and supported more spending on national defense to achieve foreign policy goals.[22] Popular Chinese films such as *Wolf Warrior 2* and *Operation Red Sea*, which depict PLA operations overseas, reflect this domestic support and serve to increase public awareness of the role of the military abroad. The Chinese public's views on such matters are important in relation to the PLA's future expeditionary force: A "hawkish" Chinese public that supports more use of the military to achieve China's goals might also support more military bases, a larger and more permanent military footprint, and increased PLA operations overseas.

Overseas Security Threats

The drivers discussed in the previous section illustrate the operational imperative for the PLA to further develop expeditionary capabilities to protect China's overseas interests. This section examines the overseas security threats that Chinese and PLA leaders assess might require the PLA to deploy. These threats involve maritime security, border security, and host-country unrest and conflict.

Maritime Security

The security of sea lines of communication (SLOCs) and maritime trade routes is one challenge the PLAN has been preparing to address in recent years. China's overseas trade relies on several major commercial shipping routes, which pass through regional hotspots such as the South China Sea, the Malacca Strait, the Bay of Bengal, the North Sea, and potentially the Arctic.[23] China has long held security concerns over the vulnerability of maritime trade routes to piracy and potential interdiction by the United States should a crisis arise. These critical waterways include the Malacca Strait, where China has raised the security level for its civilian shipping vessels transiting the area.[24] The BRI "Maritime Silk Road," which seeks to better connect China and open new trade routes through strategic access to global ports and waterways, will also create maritime vulnerabilities such as greater exposure to piracy and terrorism.[25]

The PLA is also concerned about security for overseas Chinese ports and bases. Security at Chinese-operated ports has so far been handled by a combination of local security forces and private security companies. However, as China's presence in the maritime realm expands, it will likely attempt to negotiate dual civilian-military access agreements to be able to rely more on the PLA for protection (for further discussion of Chinese overseas basing, see chapter 3 by Isaac Kardon in this volume).[26] These agreements might include preferred access to overseas commercial ports and a limited number of PLA logistic facilities collocated with those ports.[27] China's military base in Djibouti offers a potential model for the future: The PLA has permanently stationed a contingent of marines at the base, which could be used for protection but also paves the way for a larger permanent force in the future. This use of an initially small military footprint at a new base or port might be similar to how the PLA would approach future bases in countries friendly to China but wary of hosting a significant PLA presence, such as Pakistan. As with Djibouti, where Beijing paved the way for its military base by first providing arms sales and economic aid, China would likely need to couple its military presence in new locations with significant economic incentives and military aid to convince host governments to allow greater numbers of PLA troops to be stationed on their soil.[28]

Border Security

As China's interests have increased, so too have Beijing's concerns about border security, including the threat of terrorism along China's borders and further inland in neighboring countries that targets Chinese citizens or large BRI projects. This problem is compounded by China's geography: With 14 neighbors, China has the most land borders of any country in the world.[29] Chinese analysts argue that border threats have increased given expanding investments in Central Asia and South Asia, including Pakistan and Afghanistan, and because of the conflict in Syria, where Uighur fighters have joined the so-called Islamic State.[30] As a result, the PLA has focused on honing its capabilities to conduct border security and counterterrorism exercises in remote or harsh environments, such as in Xinjiang or along the Sino-Indian border, both of which have been sites of PLA high-altitude training.[31]

The PLA has also conducted joint border security exercises with Tajikistan focused on the Tajik-Afghan border, and a joint counterterrorism drill with Kazakhstan focused on striking against international terrorist organizations. The latter exercise included night reconnaissance, helicopter searches, drone reconnaissance and firepower strikes, and night ambushes.[32] Chinese security analysts have also discussed the possibility that the threat from ISIS in Afghanistan could spill over the border into Xinjiang, and there have been reports of "joint law enforcement" patrols along the China-Afghan border.[33]

Host-Country Unrest and Conflict

China has already had to confront local unrest and conflict that threaten its investments and citizens abroad. The PLA has deployed twice to evacuate citizens, sending a frigate to safeguard evacuees in Libya in 2011 and conducting a larger NEO in Yemen in 2015 to evacuate more than 500 citizens of various countries.[34] As China's presence expands in areas prone to unrest or conflict, NEOs might need to be conducted on an even larger scale. A growing concern about insurgents in Baluchistan, Pakistan, where large numbers of Chinese workers currently reside for BRI projects, provides an example of a potential crisis where the PLA might have to deploy far into a neighboring country's interior to rescue citizens.[35]

China's investments abroad also include building factories, pipelines, railways, and roadways, particularly in Central and South Asia. China has so far

protected these investments using local security forces and, increasingly, private security companies.[36] While the PLA is unlikely to deploy abroad only to protect these investments (barring other security threats), it is possible that it might try to negotiate agreements to join host-country security forces to protect vulnerable or important infrastructure such as critical oil and gas pipelines.

PLA Expeditionary Capabilities

Given the drivers of China's military footprint and the overseas security threats the military could face, what expeditionary capabilities are the PLA developing? This section explores the PLA's current expeditionary capabilities in the land, sea, air, and space domains.

Expeditionary Sea Power

Given its centrality in HA/DR, NEOs, SLOC protection, and other overseas operations, the PLAN's capabilities are continuously being upgraded, improved, or produced in greater numbers (see table 1). This has led to expeditionary capabilities that are more developed in the maritime domain than in the land and air domains.[37] Indeed, the PLAN has already deployed its expeditionary sea power capabilities in limited operations to address maritime security threats, to include conducting NEOs in Libya and Yemen, the ongoing counterpiracy operations in the Gulf of Aden since 2008, and HA/DR operations conducted by the PLAN's hospital ship. In addition, China's base in Djibouti will allow the PLAN to have a sustained presence overseas. Expeditionary sea power capabilities include surface combatants, the PLANMC, amphibious warfare ships, aircraft carriers, and a hospital ship.

The PLAN's fleet contains multiple surface combatants that are or could be used for expeditionary missions. These include the new guided-missile destroyers (DDGs) and guided-missile frigates (FFGs), which substantially increase the PLA Navy's air defense, antiship, and antisubmarine capabilities and are critical to its ability to expand maritime operations overseas. There are currently nine *Luyang III*–class (Type 052D) guided-missile destroyers deployed, with an estimated four more ships under construction as of 2018.[38] In addition, the PLA has 27 *Jiangkai II*–class (Type 054A) guided-missile frigates, which have been used in counterpiracy missions in the Gulf of Aden and in the 2011 Libya NEO.[39] In 2018, China launched its first

Table 1. PLA Expeditionary Maritime Capabilities and Missions

Capabilities	Missions
Surface Combatants: 9 *Luyang III*–class DDGs (4 under construction); one *Renhai*-class DDG; 27 *Jiang-Kai II*–class FFGs	SLOC protection and protection of maritime trade routes Protection of overseas bases and ports Host country unrest (NEOs) HA/DR Garrison protection on disputed islands in the South China Sea (Marine Corps)
Marine Corps: 30,000 personnel and seven brigades by 2020; aviation brigade	
Amphibious Warfare Ships: 5 *Luzhao*-class LPDs, one Type 075 amphibious assault ship (3 more under construction)	
Submarines: 4 *Shang II*–class SSNs, 17 *Yuan*-class SSPs (20 expected by 2020)	
Aircraft Carriers: *Liaoning, Shandong*, two domestically built ships under construction	
Hospital Ship: *Peace Ark*	

Key: DDG: guided missile destroyer; FFG: guided missile frigate; LPD: amphibious transport dock; SSN: nuclear attack submarine; SSP: diesel electric submarine; SLOC: sea line of communication; NEO: noncombatant evacuation; HA/DR: humanitarian assistance/disaster relief.

Source: *Annual Report to Congress: Military and Security Developments of the People's Republic of China* (Washington, DC: Department of Defense, 2019).

Renhai-class (Type 055) guided-missile destroyer. When deployed, this ship reportedly will be Asia's largest destroyer and will be included in aircraft carrier battlegroup formations.[40]

The PLAN has also significantly improved the shipboard air defense systems on these combatants, which helps to decrease their vulnerability to attack and is a step toward enabling the PLAN to conduct overseas maritime operations in a hostile environment—which it has yet to face in the "far seas" beyond Asia. For example, the *Renhai*-class destroyer will carry a large loadout of antiship cruise missiles, surface-to-air missiles, and antisubmarine weapons. The *Luyang III*–class guided-missile destroyer has a multipurpose vertical launch system capable of launching cruise missiles, surface-to-air missiles, and antisubmarine missiles.[41]

The PLAN is also building up its amphibious ship force, which is critical to expeditionary warfare, HA/DR, and counterpiracy capabilities. PLAN

officials are aware that these capabilities are needed in order to conduct operations overseas. Speaking in 2016, a senior captain at the Naval Research Institute, the PLAN's top think tank, flatly stated, "It is necessary to develop large amphibious ships for transporting marine forces; raise the duration, tonnage, and speed of the ships; improve the capability of rapidly ferrying Marines to perform combat tasks; [and] enhance the Marine force's capabilities of amphibious landing operations and whole-territory operations and capabilities of performing diversified tasks."[42]

The PLAN's current amphibious fleet includes five *Luzhao*-class (Type 071) amphibious transport docks, which can hold up to four air-cushioned landing craft and four or more helicopters, along with armored vehicles and troops. These ships provide increased capability for long-range operations and will be used to support PLANMC expeditionary operations. The ships have already been deployed abroad and have made up about 4 percent of China's Gulf of Aden operations since 2008. Three more ships in this class are reportedly under construction.[43]

On September 25, 2019, China launched the first of a new type of amphibious assault ship called the Type 075 that has an estimated displacement of 30,000 to 40,000 tons, compared with 41,000 to 45,000 tons for U.S. Navy landing helicopter assault/landing helicopter dock-type amphibious assault ships.[44] According to a Chinese military periodical on ship design and weapons, the Type 075 can carry as many as 30 transport helicopters.[45] These larger amphibious ships are critical for conducting expeditionary operations and supporting the PLANMC, as those ships can carry a large number of attack and transport helicopters and troops.

China currently has two commissioned aircraft carriers. The first was the *Liaoning*, a former Soviet vessel that the PLA acquired in the 1990s and commissioned in 2012. Although it has yet to conduct full carrier operations, it has been making progress toward that goal. In 2018, the PLAN launched a series of exercises on carrier group tactics in the South China Sea that featured the *Liaoning*.[46] China's first domestically built carrier, the *Shandong*, was commissioned on December 17, 2019.[47] Two more carriers are slated to be constructed, though media reports suggest that China might be in the process of scaling back its carrier construction because of cost issues and technical constraints.[48]

An expanded marine corps, supported by PLAN long-range sealift, likely will become the core of the PLA's future expeditionary force. The PLAN is expanding the marine corps from 2 brigades and approximately 10,000 personnel to 7 brigades with potentially more than 30,000 personnel by 2020. The U.S. Department of Defense also assesses that the PLANMC may establish an aviation brigade, which could provide an organic helicopter transport and attack capability, increasing its amphibious and expeditionary warfare capabilities.[49]

Expeditionary Air Power

China's leadership has pressured the PLAAF to develop more strategic airlift capability, which is a current limitation on PLA expeditionary operations. As a result, the PLAAF's leadership has publicly embraced a vision for the air force to become truly "strategic" and able to project power over long distances.[50] For example, a recent PLA media article highlighted the use of the PLAAF's Y-20 strategic transport aircraft to conduct an airdrop mission, stating that it "marks a major step forward in strategic delivery capability." The article also said that the PLAAF is continuously deepening joint training exercises with Russia, Pakistan, and Thailand to hone its overseas capabilities.[51] The PLAAF has also participated in numerous exercises outside of China, including the Peace Mission exercises with Russia, Anatolian Eagle with Turkey, and the Shaheen series with Pakistan.[52]

PLAAF capabilities have mainly been used for limited overseas HA/DR missions or multilateral exercises, but they also could be used to assist the PLAN with NEOs or for border security operations as air force capabilities improve.[53] Like the other military services, the PLAAF has been hampered by a lack of overseas facilities, which China has tried to mitigate with the base in Djibouti and by improving the PLAN's capabilities to provide platforms for aviation expeditionary missions. Construction of new hangars and airfields in the South China Sea could also extend the PLAAF's range into the Indian Ocean.[54]

The main unit involved in overseas PLAAF operations is the 39th Regiment of the 13th Transport Division, which provides strategic airlift capabilities via its small fleet of Il-76 aircraft (see table 2). China has also fielded its Y-20 large transport aircraft and the world's largest seaplane, the AG-600, which will supplement and eventually replace the Il-76.[55] The large

Table 2. PLA Expeditionary Air Power Capabilities and Missions

Capabilities	Missions
Strategic Airlift: Three IL-76 aircraft, 20 Y-20 transport aircraft	Host country unrest (NEOs) Border security HA/DR Cargo Drops
Airborne: PLAAF Airborne Corps: five combined arms brigades	

Key: NEO: noncombatant evacuation; HA/DR: humanitarian assistance/disaster relief.

Source: Cristina L. Garafola and Timothy Heath, *The Chinese Air Force's First Steps to Becoming an Expeditionary Air Force* (Santa Monica, CA: RAND, 2017).

transports are intended to support airborne command and control, logistics, paradrops, aerial refueling, strategic reconnaissance operations, and HA/DR missions and will mostly negate the strategic airlift deficiency that has hampered the PLA in its missions abroad.

The PLAAF Airborne Corps, formerly known as the 15th Airborne Corps, is China's primary strategic airborne unit. Although the Airborne Corps has mainly been used for regional missions and has lacked the transport aircraft needed to perform a major airborne operation, the Y-20 heavy transport and upgrades to smaller aircraft have enabled it to participate in more overseas missions. Within the Airborne Corps, PLAAF special forces are tasked with carrying out "penetration operations, killing key enemy figures, and destroying enemy command and control facilities."[56] PLAAF special forces units and Il-76 transport planes from the 13th Transport Division sometimes operate together, building on efforts to extend the operational range of airborne troops through paradrop operations and delivery of cargo by air.[57] This unit's overseas activities have consisted of paradrops of troops and equipment in bilateral and multilateral exercises, as well as regional HA/DR operations.[58]

Expeditionary Land Power

While the PLA has never needed to sustain significant ground force operations far from home, PLA ground forces are occasionally used during maritime operations that require the application of land power, including special operations forces (SOF), peacekeeping troops, and border security forces, and could be used in the future to provide border security, rescue hostages, or protect valuable infrastructure and facilities overseas (see table 3).

Table 3. PLA Expeditionary Land Power Capabilities and Missions

Capabilities	Missions
Special operations forces: 20,000–30,000 personnel	Border security: counterterrorism, reconnaissance Host country unrest: hostage rescue Maritime operations: counter piracy
Peacekeeping forces: ~2,500 deployed and 8,000 standby troops	Host country unrest/conflict Protection of infrastructure and oil and gas fields in Africa
Border patrol forces	Border security: counterterrorism, protection of investments in Pakistan, Central Asia, Tajikistan

Sources: Dennis J. Blasko, "Chinese Special Operations Forces: Not Like 'Back at Bragg,'" *War on the Rocks*, January 1, 2015, available at <https://warontherocks.com/2015/01/chinese-special-operations-forces-not-like-back-at-bragg/>; United Nations Peacekeeping Missions: China, available at <https://peacekeeping.un.org/en/china>.

PLA SOF have mainly been involved in counterterrorism operations and border reconnaissance. They have also been deployed on a limited basis overseas, such as during the counterpiracy missions in the Gulf of Aden.[59] The PLA is reportedly developing its special operations capabilities to build a more flexible and deployable force that can support missions abroad, such as to free hostages or support counterterrorism operations with limited or no use of force. In 2018, the PLA conducted its first holistic assessment of SOF, including evaluating command capabilities in crisis situations, night operations, and sniper and terrorist attacks.[60] Special operations forces have also practiced these capabilities in exercises with Russia and the Shanghai Cooperation Organization.[61]

In addition, China has annually deployed roughly 2,500 peacekeepers to a variety of missions in recent years and has trained 8,000 army personnel "to serve as a permanent standby force for UN peacekeeping operations."[62] PLA peacekeeping troops are primarily deployed to Africa in places such as South Sudan, where China's energy interests dictate a concern for stability and security.

The PLA ground forces also deploy units around several of China's land borders. The troops along the Sino-Pakistani border help secure the area

from terrorist threats (namely from ISIS) and prevent Uighur Muslims from leaving Xinjiang to join ISIS.[63] Although currently only a small subset of the PLA ground forces is deployed along these borders, the PLA might desire to increase its border patrol capacity or conduct deep cross-border operations requiring airlift, sealift, or special forces that operate inland, particularly given the China-Pakistan Economic Corridor and other investments in Pakistan, the threat of terrorism along the border with Xinjiang, and concern over the border with Afghanistan. PLA border forces have reportedly conducted patrols along some Central Asian borders and have a small border facility in Tajikistan where they can monitor the Wakhan Corridor passage into Afghanistan.[64]

Space-Based Capabilities

The PLA's space-based capabilities enable military operations abroad. These include a growing constellation of satellites that provide intelligence, surveillance, reconnaissance, and network connectivity, which are crucial to the PLA's ability to command forces over long distances and for logistics support for overseas operations. The PLA's Strategic Support Force, established at the end of 2015, will play a role in integrating these space-based capabilities (for more on this force, see chapter 13 by Dean Cheng and chapter 6 by John Chen, Joe McReynolds, and Kieran Green in this volume).[65] The PLA continues to invest in improving its capabilities in intelligence, surveillance, and reconnaissance; satellite communication; satellite navigation; and meteorology, which would provide real-time data and intelligence support, early warning, and maritime surveillance. PLA writings also note that these capabilities can provide "battlefield environment support," a term the PLA uses to describe battlespace-relevant survey, mapping, meteorological, oceanographic, and navigation information, which would assist expeditionary forces facing a hostile environment overseas.[66]

China has a growing fleet of maritime surveillance satellites, dual-use oceanographic and hydrological satellites, and an expanding constellation of Beidou navigation satellites, which diminishes China's reliance on the U.S.-produced Global Positioning System and plays a critical role in enabling PLAN overseas operations. The Beidou constellation was completed and declared fully operational in July 2020.[67]

Challenges for PLA Expeditionary Capabilities

Although the PLA has made significant strides in its expeditionary capabilities, some gaps need to be filled before China can field a force capable of fully addressing overseas security threats. Key challenges include personnel and training; command, control, and coordination of overseas forces; logistics and basing; and the need to balance resources between requirements near to and far beyond China's borders.

Personnel and Training

Only a small number of PLA troops have deployed abroad, mainly for peacekeeping and counterpiracy operations. These operations provide some practical experience for Chinese troops in a low-risk environment. UN PKOs, for example, provide the PLA with experience working with multinational forces overseas. PKOs also provide some deployment experience for the PLA's SOF units, which have been sent to the UN mission in Mali.[68] Apart from PKOs and multilateral exercises conducted through the Shanghai Cooperation Organization, however, the PLA does not have a great deal of experience working with or commanding multinational forces in hostile environments.

The relatively small number of troops deployed overseas means that the PLA is essentially "learning while doing." The PLA has tried to augment its overseas experience with more realistic training to hone the skills necessary for long-term naval and air deployments. For example, Chinese media highlighted PLAN training in the South China Sea in 2017, which focused on "far seas" training staged from the Sanya Training Base. The exercises included a guided-missile destroyer, a supply ship, shipborne helicopters, and dozens of marines. The training focused on honing skills for a number of expeditionary missions, such as escort missions, counterterrorism, counterpiracy, and maritime defense in the South China Sea, the eastern Indian Ocean, and the western Pacific Ocean.[69]

Command, Control, and Coordination of Overseas Forces

Command, control, and coordination of overseas forces is another major challenge the PLA faces. The PLA's extensive reorganization is ongoing and raises questions of how command of overseas missions will be carried out (for more on this subject, see chapter 4 by Phillip C. Saunders in

this volume). The answers are yet unknown, though one could speculate that the command authority might be based on the contingency and force capabilities needed to address it. For example, the Western Theater Command focuses on India, border patrol, and counterterrorism missions. This would potentially be the theater that would coordinate security along the border and within Pakistan, where terrorism is a concern. The Western theater also has authority over border patrol troops, for example, to secure the China-Afghanistan border.

The tyranny of distance leads to issues of communication and decision-making during expeditionary missions. PLA leaders might not trust the ability and willingness of a commander in charge of a larger force abroad to make autonomous decisions in complex situations, particularly with little training or experience. Thus, the PLA needs a means of coordinating expeditionary missions and troops abroad, as well as ensuring that political requirements and China's interests are considered. Beijing has begun to put bureaucratic structures in place to address this issue. The Central Military Commission Joint Staff Department established an Overseas Operations Office in 2016, which was described as being "responsible for directing and coordinating actions carried out by Chinese troops overseas." According to media reports:

> *The "Overseas Operations Office" not only requires "operational commanding capabilities" but also "policy capacity." Policy capacity refers to the ability to grasp the national security situation and bilateral relations. For example, the evacuation operation in Yemen required the assessment* [of the] *local security situation and diplomatic access to enter the port of Aden.*[70]

In addition to coordinating its own forces, the PLA will have to coordinate with the host country's forces and government. While the Overseas Operations Office might assist, it is likely that much of this coordination will occur on the ground. For PLA troops participating in peacekeeping operations, the Joint Staff Department and the relevant theater commands assist in developing and transporting forces to the UN PKO mission, which then integrates them into the peacekeeping forces.[71] In Central Asia, coordination likely would occur through the Shanghai Cooperation Organization or through China's bilateral relationship with Russia. However, if China plans to station more troops abroad in other areas—which is likely if the PRC follows

its base in Djibouti with more overseas bases—Beijing increasingly will need to coordinate with host countries on a bilateral basis.

Logistics and Basing

Logistics for expeditionary missions is another challenge for the PLA. As previously mentioned, PLA forces on long-term and long-distance deployments have been hampered by inadequate airlift and sealift capabilities and, in the case of the PLAN, by insufficient capacity for at-sea replenishment. However, the PLA is working to bridge this capability gap by significantly increasing the number of commissioned replenishment ships and Y-20 aircraft, which can conduct aerial refueling.[72] China's naval base in Djibouti will assist the PLA with logistics for future expeditionary missions by providing a permanent logistics hub.

In addition, China will likely attempt to negotiate agreements with countries such as Pakistan, Sri Lanka, and Cambodia to secure future military access to ports. These basing agreements are important for future PLA expeditionary capability. For example, while the PLANMC is training for expeditionary missions, the PLA lacks a sufficient inventory of helicopters required for an air assault capability. Achieving this capability would require basing helicopters overseas or operating from amphibious ships, neither of which the PLA is currently able to accomplish.[73]

The PLA also established the Joint Logistic Support Force in 2016 to unify logistics between the services and support the new theater command structure. Key for expeditionary missions, the Joint Logistic Support Force is undergirded by an integrated command network and aims to modernize the PLA's "strategic delivery" capability.[74] However, like most of the PLA's expeditionary capabilities, the logistics system has not yet been tested by a contingency requiring significant mobilization of resources far beyond China's shores.

Balancing Competing Requirements

How the PLA balances funding regional versus global missions will impact the capabilities of its future expeditionary force. Some expeditionary capabilities, such as amphibious landing operations, are currently resourced for various regional contingencies (such as a Taiwan scenario) and training and equipping responsibilities given to the theater commands responsible for preparing for those contingencies.[75] These "dual-use" regional and

expeditionary capabilities, combined with the PLA's limited overseas missions to date, likely have not yet overstretched the budget.

However, as the PLA's expeditionary footprint grows, so does the expense. Future funding priorities could include more overseas facilities and infrastructure, investment in personnel training for overseas missions, expeditionary naval and air capabilities, and capabilities for amphibious operations. The funding of civilian assets for an overseas logistics system would also be a priority as China expands its basing infrastructure. These are all costly capabilities, and it remains to be seen whether the PLA chooses to spend resources overseas when it also has pressing regional security requirements.

Conclusion

The drivers and capabilities described in this chapter demonstrate that the PLA has an operational imperative to develop an expeditionary force to protect its overseas interests and is investing in the means to perform those missions.

How will Beijing choose to deploy its expeditionary forces in the future? It is possible that China will choose to use its expeditionary force under five conditions. First is when the Chinese public or international community pressures Beijing to act. Examples include the 2015 NEO in Yemen, counterpiracy operations in the Gulf of Aden, and the opening of the base in Djibouti. Second is when Chinese interests are directly threatened, such as protecting infrastructure and energy projects or Chinese nationals living in BRI countries from terrorist threats. Third, the PLA might deploy forces when its presence can help build China's influence and military ties with host governments or train local forces to help secure China's interests. PLA deployments to Tajikistan and presence along border areas with Pakistan and Afghanistan are examples. Fourth, the PLA can gain overseas deployment experience while protecting China's interests and contributing to international security missions. The PLA's participation in PKOs in Sudan and Mali fall into this category. Fifth is when the PLA's expeditionary capabilities are matured enough to accomplish the mission and when other options, such as relying on other countries' capabilities, are insufficient.

The PLA's current expeditionary force development is still heavily weighted toward the maritime domain. This situation is likely to continue given that maritime expeditionary capabilities already have been necessary to evacuate

PRC citizens and likely will be needed in the future. In the near term, the PLA will probably deploy for additional maritime missions, including the protection of overseas ports such as Djibouti and dual-use facilities in Pakistan or other countries, depending on the agreements reached between China and host countries. In addition, the PLA may play an increased role in overseas SLOC protection; for example, China has voiced an interest in a collective security effort to protect the trade routes transiting through the Persian Gulf. Greater PLAN participation in that theater would represent a significant step up from the PLA's counterpiracy operations.[76]

The PLAN will also continue to train the marine corps for overseas amphibious landing operations, a critical capability for the PLA to be able to conduct larger NEOs. This capability will likely take several years of training cycles and integration of new equipment, such as the large-deck amphibious assault ship that the PLAN has recently commissioned. China's maritime expeditionary capabilities will be augmented as PLAAF strategic airlift and other long-range naval and air platforms improve.

Given concerns over instability in Central and South Asia and the potential need to deploy the PLA to those regions in a crisis, the PLA is augmenting its border security capabilities by increasing its presence along its frontiers with Pakistan, Afghanistan, Tajikistan, and other Central Asian countries, and by partnering with other countries' security forces. In the future, the PLA will likely participate in more joint patrols with other countries, both as a means of bolstering its own capabilities and to form closer partnerships with countries that have Chinese investments. It is also possible that the PLA will establish more facilities in border areas that would support a permanent military presence. More PLA presence in these areas and partnerships with host-country forces will be important if the PLA needs to quickly deploy for cross-border operations that require airlift or special operations forces.

Finally, the PLA will continue to integrate space-based capabilities as they come online, which will result in a greater ability to use surveillance, navigation, and communications capabilities around the globe. The PLA will also need to fill several gaps in order to field a larger expeditionary force, including building a more robust overseas logistics system, improving personnel training for overseas missions, and clarifying command and control for expeditionary deployments.

A stronger PLA expeditionary capability will present some opportunities for the United States, its allies, and its partners by allowing China to assume more of the burden for international security, such as counterpiracy, counterterrorism, and NEOs. However, this development also raises the question of whether greater expeditionary capabilities will result in Beijing choosing to more frequently use military force overseas. Certainly, a larger PLA presence abroad will give Beijing more military options to respond to crises. China might choose to exercise those options against threats or in locations where PLA presence is already established or can be rapidly increased. A key question is whether stronger PLA expeditionary capability will lead to a more interventionist China that uses its overseas military power as a foreign policy tool.

For now, the United States should look for opportunities to shape China's use of its expeditionary military force. This could mean rallying allies and partners to back Chinese action to resolve security issues, or it might include using the lack of foreign support for PLA involvement to attempt to tip China's calculus in the direction of pursuing nonmilitary options. Regardless, the PLA will continue to develop its expeditionary capabilities in the land, sea, air, and space domains, with the goal of becoming a force that can both be deployed flexibly in a crisis and support sustained engagements overseas.

Notes

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CHAPTER 2

Crossing the Strait: Recent Trends in PLA "Strategic Delivery" Capabilities

By Chung Chieh and Andrew N.D. Yang

In March 2015, the People's Liberation Army Air Force (PLAAF) sent its first mixed group of planes to conduct long-range training beyond the First Island Chain, flying over major channels including the Miyako Strait and the Bashi Channel.[1] Since that time, the PLAAF has maintained a constant presence in the Western Pacific while patrolling airspace over islands and reefs in the South China Sea. Since President Tsai Ing-wen took office in Taiwan on May 20, 2016, and the Democratic Progressive Party became the ruling party after gaining dominance in the executive and legislative branches, the PLA has regularly conducted long-range training at sea and in the air, including sending planes to fly past Taiwan's east coast. From November 2016 to March 2020, 25 flights of this kind were flown.[2] The PLA Navy (PLAN) was not any less assertive. The *Liaoning* aircraft carrier battle group crossed into the Western Pacific three times between December 2016 and March 2020.[3] In June 2019, after cruising into the Western Pacific, it sailed into waters off the Japanese-controlled Okinotorishima reef and the U.S. territory of Guam before entering the South China Sea through the Sulu Sea and heading back to China.[4] These moves indicate that the PLA is eager to enhance its offshore operations, which depend on what the PLA refers to as a "strategic delivery" capability.

This chapter assesses the PLA's progress in improving its strategic delivery capabilities through the lens of potential combat operations against Taiwan. In mainland Chinese scholars' assessments, taking Taiwan by force is referred to as "joint attack operations against a big island [*daxing daoyu lianhe jingong zuozhan*, 大型岛屿联合进攻作战]."[5] Given that such a campaign will be subject to "constraints due to international politics and diplomatic struggles," especially the "intervention by military powers," how to increase operational effectiveness and "fight a quick battle for quick results" in the shortest time possible is a matter of great importance.[6] However, the PLA has yet to acquire the capability to achieve that goal. One of the main causes is its lack of a sufficient strategic delivery capability. As seen from the moves it has taken in recent years, the PLA intends to strengthen that capability.

This chapter discusses the development of the PLA's strategic delivery capabilities, and its implications for cross-strait operations, in five sections. The first section covers the PLA's definitions of strategic delivery and key milestones. The next section surveys PLA assessments of the strategic delivery capacity the PLA needs to launch an invasion of Taiwan. The third section covers current PLA shortcomings in attaining an ability to invade the island. This is followed by a discussion of recent improvements in the PLA's strategic capabilities and an assessment of the PLA's likely next steps. The conclusion summarizes the findings and offers recommendations for Taiwan's military development.

The assessment in this chapter is based on a range of underutilized but insightful PLA publications, including recent articles in journals such as the *Journal of Military Transportation University*, *Traffic Engineering and Technology for National Defense*, and the *Journal of Ordnance Equipment Engineering*, and books published by the PLA National Defense University and the PLA Logistics Academic Research Center. The writers of these articles and books are mostly active-duty PLA commanders and staff officers directly involved in strategic delivery operations, academics who teach courses in relevant subjects, and officers pursuing further education at military academies. Their writings provide diverse and objective perspectives and are also more detailed than the writings that appear in *PLA Daily*.

Strategic Delivery

The concept of "strategic delivery" [*zhanlüe tousong*, 战略投送] has gained more attention from the PLA in recent years. The PLA defines *strategic delivery* as an "action aimed at achieving certain specific strategic goals that integrates all sorts of transportation means to project forces to war zones or areas at risk."[7] The concept also emphasizes that "enhancing the military's remote strategic delivery capability is not only part of preparations for war but also an effort to ensure battlefield initiative, advantageous positions, and winning conditions."[8] Strategic delivery capabilities serve several types of missions, including large-scale joint operations, security threats from multiple directions, China's overseas interests, military operations other than war, and requirements for defense and military infrastructure.[9]

Among these mission types, large-scale joint operations cover modes of operations such as joint strikes, joint sea-air blockades, defense of and offense against islands and reefs, and joint landing operations.[10] Large-scale joint operations involve strategic delivery missions of various sorts, including rapid deployment of combat units, airlifting troops, delivery of special operations troops, rapid deployment of strategic nuclear weapons, emergency delivery of materials, forward deployment of strategic medical service forces, and evacuation of wounded and sick soldiers. Based on this description, the *large-scale joint operations* mentioned in mainland Chinese scholars' discussions about strategic delivery are actually a different term for an invasion of Taiwan, also known as *joint attack operations against a big island*.

In building its strategic delivery capabilities, the PLA is following a three-step development strategy. These goals essentially refer to the requirements for being able to invade Taiwan while handling contingencies in other theaters. Specifically, by 2020, the PLA aimed to have the strategic delivery capability to "answer the needs of main theaters of operations [that is, the Taiwan Strait] and any single strategic direction."[11] Next, by 2025, the PLA should have a strategic delivery capability that "answers the needs of over two strategic directions or inter-continental delivery."[12] Finally, by 2035, the PLA's objective is to acquire a strategic delivery capability that allows it to "quickly reach its overseas core-interest areas."[13]

PLA Strategic Delivery Capacity Required for a Campaign Against Taiwan

If the PLA launches an invasion of Taiwan, it will need to deploy troops from multiple theater commands and services. The number of troops involved, the scale and extent of the operations, the intensity of the conflict, and materials consumed will be enormous. The strategic delivery capacity needed for such a campaign is very likely to surpass that for any previous campaigns that the PLA has ever launched. Strategic delivery for the campaign will involve "forward deployment of whole-unit troops," "evacuation of wounded and sick soldiers," and "supply and transportation of large amounts of equipment and materials."[14] However, the PLA seldom if ever reveals information about the number of troops and amounts of materials to be involved in such a campaign. Only in some academic publications can we find some insights.

PLA academic writings suggest that an invasion of Taiwan requires the PLA to launch large-scale joint operations by sea and air. The number of troops to be projected to medium- and long-range destinations are assessed to be in the hundreds of thousands.[15] As studies by the PLA Logistics Academic Research Center point out, advance troops are estimated to be in the tens of thousands, roughly equal to six combined arms brigades.[16] Most of these forces will be delivered by plane. Airborne delivery, encompassing troops carried by helicopters to conduct maneuver warfare from the air, normally transports two brigades per mission.[17] Seaborne delivery should have a capacity for transporting two to three pre–military reform heavy army divisions at a time.[18] Another analysis from the same research center estimates that the "combat materials" to be consumed will weigh 30 million metric tons, while oil consumption will reach 5.6 million metric tons.[19] Amphibious landing operations by a single combined arms brigade are estimated to consume 625,457 kilograms of petrol and diesel per day.[20]

Studies from the PLA Logistics Academic Research Center also argue the PLA will suffer a high "combat attrition rate" due to the "enemy's capability to conduct surveillance and reconnaissance and precision strikes with deadly weapons" and the difficulty of launching cross-strait operations. This research provided the following anticipated attrition rates: 7 percent for the ground combat force, 15 percent for the maritime combat force,

10 percent for the air combat force, and 5 percent for the Rocket Force. The total number of injured is estimated to be about 120,000.[21] Nearly 50,000 beds are needed to take care of the wounded troops.[22] Other studies have also estimated that, because of the "extreme conditions in the theater of operations," the number of seriously wounded service members will be between 67,500 and 81,000.[23]

Large-scale joint operations against Taiwan are highly demanding in terms of the number of troops, equipment, and wounded personnel that need to be transported. According to a study by the PLA Logistics Academic Research Center, the entire operation is estimated to require about 3,000 train trips, 1 million vehicle trips, 2,100 aircraft sorties, 15 oil pipeline brigades, and more than 8,000 ship voyages.[24] Moreover, any future invasion of Taiwan would be what the PLA refers to as an "informationized local war." Therefore, the PLA's strategic delivery capabilities must become more informationized (and "intelligentized," referring to the application of even more advanced technology) to increase their accuracy and capacity.[25]

Current PLA "Strategic Delivery" Shortfalls for an Invasion of Taiwan

Although the PLA hopes that its strategic delivery capability will be sufficient to support an invasion of Taiwan by the completion of the current round of reform in 2020, open-source information published between 2017 and 2019 shows that there are still significant gaps in the PLA's aviation and maritime strategic delivery capabilities, vulnerabilities in ground infrastructure, and limited "jointness" in the logistics system, all of which would pose serious obstacles in any near-term plan to invade Taiwan.

Insufficient Aviation Strategic Delivery

The PLA's aviation strategic delivery capabilities include both regular military transport aircraft and a support fleet of civilian planes. At the end of 2017, the PLA's military transport planes accounted for only around 4 percent of the world total, and its large airlifters accounted for only 24.7 percent of its transport fleet. The PLA did not have any heavy airlifters.[26] In a Taiwan campaign, if all of the PLA's limited inventory of Y-20, Il-76, and Y-8C transport planes were used, with the number of planes calculated on an 80 percent combat readiness ratio, only the equivalent of less than

two armed paratrooper brigades/regiments could be projected by aircraft, a capability "far away from the level for strategic delivery."[27] Three additional problems are also apparent. First, a shortage of specialized loading and unloading teams results in low efficiency in loading and unloading military materials.[28] Second, limited information support reduces the PLA's ability to load and unload containerized air cargo.[29] Third, complicated work procedures and poor communication between units results in delayed airborne delivery of materials to offshore locations.[30]

PLA sources argue that insufficient military airlift capacity can be improved through *civil-military integration*, which in this context refers to the mobilization of civil planes for military delivery. By the end of 2017, mainland China had a total of 3,296 civil aviation planes of all sorts and 229 civil airports of various kinds.[31] In 2013, the first strategic delivery support fleet composed of civil aviation planes was formed. By the end of 2017, the PLA had established 15 strategic delivery support fleets with planes selected from major carriers.[32] However, Liu Jiasheng, a staff officer at the Central Military Commission (CMC) Logistic Support Department's Transport and Projection Bureau, points out that mainland China's cargo planes accounted for only 4.7 percent of its total civil aviation aircraft in service by the end of 2018.[33] According to PLA estimates for strategic delivery capacity, the percentage of large civil cargo planes should be at least 8 percent of the total.[34]

The PLA also suffers several other weaknesses in its ability to mobilize civil aviation planes. First, due to smaller cabin doors, cargo compartments, and floor load capacity, current civil cargo planes cannot provide rapid mobility for large and heavy military equipment.[35] Second, military and civil aviation facilities do not have the same standards and requirements, causing the "problem of civil aviation planes unable to land at a military air base to still exist."[36] Third, communications between the military and civil aviation sectors in airborne strategic delivery are insufficient. This means that the military lacks a full grasp of real-time information about available civilian planes.[37] Fourth, many relevant laws and regulations clarifying the technical standards for dual-use aircraft have yet to be issued, while regulations governing civil aviation and military transportation services are out of date.[38]

Insufficient Maritime Strategic Delivery

PLA sources describe several deficiencies in the PLA's maritime strategic delivery capabilities. Perhaps the most serious weakness is the lack of standardized active-duty delivery equipment. Problems with the PLA's marine transportation include "a severe shortage of large standardized ocean-going logistics vessels and an even smaller number of ships that can be used to carry troops across the strait to conduct amphibious landing operations, with existing ships small in tonnage and capable of carrying only a small number of troops."[39] There is also the problem of "failure to provide logistics support of various sorts for large-scale operations."[40] In the view of one mainland Chinese assessment, if the PLA used all transport ships and landing vessels at its disposal, it could project less than two marine brigades across the strait, a far cry from the goal of sending two to three pre–military reform heavy divisions.

As with airborne strategic delivery, the PLA also has shortages in civilian maritime transport vessels. Although the PLA owns more larger size transport ships and established the first seaborne strategic delivery support fleet in Shanghai in July 2013,[41] roll-on/roll-off ships suitable for carrying heavy equipment for rapid delivery are not sufficient.[42] This problem is compounded because most civilian ports include limited defense logistics functions, lacking contingency piers, piers for roll-on/roll-off ships, and heavy loading and unloading equipment.[43] This seriously limits the development of maritime strategic delivery capability and the extent to which such capability may be used. Local forces seldom if ever participate in maritime training and important missions, which can directly affect the effectiveness of mobilization of troops for seaborne strategic delivery.[44]

PLA authors also document weaknesses in informationized logistics support for maritime strategic delivery. For example, the PLA's satellite resources are in short supply, while battlefield situation awareness and logistics support for communication remain weak.[45] Even a single mission would require much planning in advance and concentration of resources from all available sources.[46]

Inadequate Ground Infrastructure

Weaknesses in the PLA's ground infrastructure include the ground transportation network's lack of enough room for use by the military, insufficient

logistics capacity for the airports, and insufficient logistics capacity for the commercial ports. If the PLA uses force against Taiwan, problems will arise during the pre–loading assembly and pre-delivery stages because troops and materials are deployed in a scattered fashion. The traffic routes involved are very complicated. In its past planning for civilian highways, mainland Chinese officials failed to think much about their military use. Especially noteworthy is the "relative weakness in the infrastructure of main airports, ports, roads, and railroads," indicating "inability to adapt to new tasks and deal with situations that arise."[47] Although the Eastern Theater Command, responsible for Taiwan, has high-capacity traffic networks, the networks may not necessarily meet the demands of strategic delivery. For example, the extensive high-speed rail network in the command cannot carry vehicles and other equipment for delivery purposes.[48]

Another set of problems concerns airport capacity. Hai Jun, a professor at the Joint Projection Department of the PLA's Military Transportation University, argues:

> *Among all the air bases, less than 15% can accommodate large transport aircraft like the Il-76. Airport logistics vehicles vary in model and type, capable of serving only one single function at a time. They cannot provide logistics support for large aircraft or a wider range of aircraft. The logistics support capabilities of a small handful of comprehensive support bases and multi-aircraft support bases are quite limited.*[49]

In the event of an emergency situation, airports would have difficulties executing airlift missions. Large amounts of materials would end up going nowhere.[50]

Still another weakness is that the infrastructure built by the PLA for strategic delivery, including airports, train stations, piers, bridges, and railways, is likely to be targeted for precision attacks by the enemy. In recent years, Taiwan's military has put emphasis on joint suppression warfare with the objective of neutralizing enemy troops as they are still gathering or loading equipment. The PLA is increasingly concerned about this development.[51] Wang Fengzhong, an associate professor at the Military Transportation Academy, wrote:

> *In our cross-strait amphibious landing operations in the future, the enemy . . . would launch various forms of attack, including airstrikes that bring damage to us and stop us from launching amphibious landing opera-*

> *tions. Airports, ports, logistics bases, transportation junctions, hospitals and other fixed logistics facilities, and logistics forces would be attacked by the enemy from all ranges and all directions.*[52]

Wang added that under enemy attack, the logistics support system closely connected with strategic delivery for operations against Taiwan is "at risk of being paralyzed."[53]

Limited Jointness

Insufficient "jointness" in the logistics system could also hamper PLA strategic delivery operations in a Taiwan conflict. If the PLA launches an invasion, there will be a plethora of logistics requirements, a wide range of composing forces, a multitude of transport links, and far too frequent switches from one transport platform to another. PLA scholars assess that the military lacks a very powerful joint transport command mechanism to deal with these problems[54] and does not have an "all-dimensional informationized management system for strategic delivery" to manage and control work processes.[55] Recent reforms to the logistics support mechanism cannot meet the demands of joint operations. Zhang Fang, director of the Air Force Logistics Division's Transport and Delivery Bureau, argued:

> *Following the restructuring mandated by this round of military reform, the newly established theater commands and joint logistics bases have all set up transport and delivery departments. However, the responsibilities, operating mechanism and work flow involved have yet to be clarified . . . while areas ranging from civil-military cooperation, links between the military and local authorities, available strength and means, to required standards and systems are devoid of a top-down design. Mission planning, monitoring of work in progress, and streamlined management of ground logistics support are still at the start-up stage. There is insufficient knowledge of logistics support for large-scale airlift operations and associated organizational work flow.*[56]

From the study by a mainland Chinese scholar, we can find that the shortcomings mentioned above still existed in the first half of 2019.[57]

Limited joint training is another apparent problem. The PLA's strategic delivery forces subordinate to navy and air force combat units do not have

many chances to organize basic training and specialized transport and delivery training on their own.[58] Their training focuses on basic combat skills, with much less attention to transport and delivery practice.[59] What is worse is that the joint sea-air delivery drills needed to prepare for "joint attack operations against a big island" are "still at the level of theoretical research."[60]

Recent PLA Measures to Improve Strategic Delivery Capability

To address the weaknesses mentioned above, the PLA has adopted a variety of measures over the past decade. Key efforts under way prior to the recent reforms include construction of additional air and maritime strategic delivery capabilities and the creation of a strategic delivery system based on a series of logistics bases. Key themes of the current reforms include improving the joint delivery command system, civil-military integration, and joint delivery drills. This section discusses each of these developments.

Enhancing Delivery Power

In terms of force development, the PLA's first priority has been to increase its aviation strategic delivery force.[61] There are several elements. First is the introduction of large military transport aircraft like the Y-20s and Il-76/78s.[62] Second, to increase domestic production of large transport aircraft, mainland China has initiated research projects on key subsystems that include fuel, avionics, environmental control, flight control, and electrical and mechanical systems (but not engines).[63] Third, efforts have been made to increase the number of helicopters with medium- and long-range strategic delivery capability. Fourth, a "strategic delivery support fleet" has been formed from the civilian aircraft fleet. Medium to large civilian passenger and cargo planes are regularly featured in military training, rescue and disaster relief, antiterror operations, international aid, evacuation of overseas citizens, and other important missions.[64]

A second priority has been boosting the PLA's maritime strategic delivery capabilities. This has also involved a range of efforts involving military and civilian forces. Ocean-going comprehensive supply ships, amphibious transport docks, and amphibious assault ships have been built, or are under construction, to satisfy seaborne strategic delivery requirements. Moreover, Chinese authorities have encouraged civilian shipbuilders to construct roll-on/roll-off

cargo ships, which feature fast loading and unloading, a high turnaround ratio, and flexible accommodation for both tracked and wheeled vehicles.[65] This construction supports the establishment of a maritime strategic delivery reserve force based on state-owned large ocean shipping enterprises and maritime transportation companies.[66] Marine transportation groups that can be readily deployed have also been established in each coastal province.[67]

Perfecting the Delivery System

To improve its strategic delivery capability, the PLA has pursued the construction of a strategic delivery system according to "decisions made by the Central Military Commission."[68] The PLA's strategic delivery system is composed of a number of delivery bases and delivery logistics support points that are located in different places and vary in size. These include "central delivery bases," "direction delivery bases," "delivery logistics points," and offshore delivery logistics support facilities.[69] The aim is to "combine pre-positioning of forces and materials with direct delivery action" and "integrate logistics support and operational command" to enhance strategic delivery capability.[70]

Within this system, the central delivery base provides logistics support for strategic delivery, executes strategic support, and sends strategic reserve forces or other forces to direction delivery bases, delivery support points, and even overseas mission areas.[71] The central delivery base can support several modes of delivery, such as by rail, road, waterway, and air. The PLA started to construct the central delivery base in 2011.[72] It is located in Zhengzhou, Henan Province, and became operational in early 2017.[73] Designed to perform the core functions of materials storage and transshipment, the base consists of four cargo terminals, a joint inspection waiting room, a materials storage yard, an assembly and waiting-for-delivery area, a crew, and associated equipment.[74]

At the next level in the system, the PLA has built direction delivery bases to support the individual theaters.[75] In the Eastern Theater Command, for instance, delivery bases have been established in Zhoushan and Taizhou. These bases, which are subordinate to the nearby Joint Logistic Support Centers, are permanent units established by the military and civilian sectors or by the military alone.[76] They are mainly responsible for delivery of troops, advance storage and transshipment of emergency materials, and evacuation

of wounded and sick soldiers.[77] A priority has been improving the "informatization" of these bases so that personnel and materials may be identified via artificial intelligence and other advanced technology, increasing the speed and delivery of their operations.

At the bottom tier of the system are ad hoc delivery support points.[78] These are anticipated to be located in all of mainland China's regions with convenient traffic access. They receive whole-unit troops/squads and equipment and materials from central delivery bases or direction delivery bases. Some of them will be located not far from a theater of operations and thus will be subject to enemy missile attacks or airstrikes. This means that they must be built in a way that solidifies them and makes them better able to survive in the field. They also serve as departure points for troops dispatched from places deep within the theater commands. For specific missions like an invasion of Taiwan, the PLA would make arrangements in advance for delivery support points based on preexisting contingency plans. The PLA hopes that, once a war breaks out, troops will use delivery support points via either military or civil transport facilities and vehicles to conduct rapid delivery of supplies.[79] As soon as troops tasked with the missions arrive at the bases, they can receive "one-stop" delivery support service according to orders from their superiors and mission requirements.

Establishing an Integrated Joint Delivery Command System

In this round of military reform, the PLA seeks to establish an "integrated joint delivery command system" [*yitihua lianhe tousong zhihui tixi*, 一体化联合投送指挥体系] under the CMC and the theater commands. The system exercises unified command and control over the army, navy, and air force. At the top of the system is the CMC Joint Operations Command Center. The center commands joint delivery operations with strategic significance, while subordinate joint delivery commands, led by the theater command Joint Operations Command Centers, take care of joint delivery plans and other relevant tasks.[80] Joint delivery command posts are to be set up in key areas, authorized by theater commands to handle loading, unloading, and transshipment.[81] Theater command joint delivery command authorities also have to integrate "all sorts of transport systems to achieve unified management, command and logistics information resources" to establish a "transport information database."[82]

The execution of the PLA's strategic delivery programs follows the *Strategic Delivery Regulations of China's People's Liberation Army*, which provide guidance for the CMC, theater commands and their joint logistics support forces, and power projection forces.[83] These guidelines lay out unified control over military and civilian projection forces within the theater commands and those of each service, help simplify strategic delivery command and plan management procedures, and aim to increase strategic delivery efficiency and effectiveness.[84]

Increasing Civil-Military Integration

As noted above, the PLA is plagued by a weak transport support capability. The only way to increase the PLA's transport capacity in a short period of time without incurring major military costs is through civil-military integration. Specific goals of civil-military integration in this context include increasing efficiency at assembly areas in order to reduce the time needed for mobilization, transport, and distribution and loading of troops and materials and integrating military and civilian transport vehicles to "enable rapid and highly efficient joint delivery, take initiative in a powerful manner, increase combat power through improved delivery capability, create an advantageous situation, and fulfill strategic aspirations."[85]

Several measures have been launched in recent years to strengthen civilian support for military transportation. One is the reform of civil transportation mobilization organizations. Under the guidance of the central government's National Traffic War Readiness Office, all provinces and equivalent elements of the military have established corresponding traffic war readiness departments.[86] Local transportation and communications departments, state-owned medium and large transportation and communications enterprises, and a number of other business units have also set up traffic war readiness offices.[87]

Civil-military integration has also been strengthened through a number of regulations, including the *Law of the People's Republic of China on National Defense Transportation*; *Regulations on the National Defense Mobilization of Civil Transport Resources*; and *Regulations on National Defense Requirements for Transportation, Postal Service, Electric Power and Communications Infrastructure*. Other relevant regulations provide a legal basis for

mobilizing, guiding, and planning local delivery logistics support capability.[88] For instance, through the *Technical Standards for Newly Built Civilian Ships Meeting Military Requirements*, authorities demanded strategic delivery requirements be included in the design and construction of transport ships.[89]

Based on these regulations, civilian assets and transportation infrastructure have increasingly been built to military standards. For instance, onboard hook equipment reserved for light portable weapons has been installed on civilian planes to meet airborne troops' demand for airlifting weapons and equipment.[90] Similarly, adjustments have been made to cabin doors and cargo-handling systems to increase civil cargo planes' compatibility with military requirements.[91] In terms of the compatibility of facilities, the runways of civil airports above class 4C in primary theaters (for example, opposite Taiwan) are being extended according to landing requirements for the PLA's main transport aircraft, the Y-20 and Il-76. Similar policies have guided the construction of civil transport ships, ground infrastructure, and other capabilities.

Expanding Joint Delivery Drills

To correct its lack of experience in joint sea-air delivery operations, the PLA has started to map out plans for "combined arms brigades' cross-region joint delivery" drills set against the background of "joint attack operations against a big island."[92] The focus of attention is the inclusion of "counter-reconnaissance and surveillance with high-tech equipment, counter-precision strikes, and counter-raids by special operations troops" in the themes of the drills.[93] The move is clearly a response to the Taiwan military's joint reconnaissance and surveillance and joint suppression tactics. In addition, exercises also increasingly feature civilian participation. In the new joint delivery command system, theater commands plan peacetime "joint training between the military and civilian sectors" and joint sea-air delivery training.[94] Local transportation resources also participate in military training exercises each year.[95]

Next Steps for the PLA's Strategic Delivery Capabilities

According to PLA studies and state media reports, the PLA is likely to focus further improvements in its strategic delivery capabilities relevant for "joint attack operations against a big island" on four areas: strengthening

"informatization"; upgrading protection for strategic delivery assets; planning and launching realistic air-sea delivery drills; and perfecting relevant laws, regulations, and technical standards to improve civil-military integration.

One focus of improvements to the PLA's strategic delivery system will be stronger information support. This will likely consist of several efforts. First is establishing a "national defense transportation information management platform" for integrating all elements of the strategic delivery logistics support system.[96] Second is establishing an "all-dimensional informationized strategic delivery management system," based on automated handling technology and a transport delivery support database, to enable the sharing of transport delivery information and automatic information searches.[97] Third is developing visualization systems based on local Internet connections, regional traffic command and control centers, and the Beidou navigation system.[98] These systems are capable of real-time tracking of troops, equipment, and materials in transit. This system will contribute to all-element and all-process precision control.[99]

Another priority will be reinforcing protection for strategic delivery systems. As some PLA scholars have emphasized, the battlespace in modern information warfare is highly transparent. To effectively conceal delivery attempts and achieve delivery objectives, delivery forces must enjoy as much protection as possible. Therefore, the *active defense* principle should be embodied in the strategic delivery process to make sure that troops, equipment, and materials can "effectively reach" designated areas.[100]

The PLA is also likely to focus on improving its joint delivery drills. Once improvements to the PLA's ground infrastructure yield initial results, the PLA is very likely to plan and launch realistic sea-air delivery drills featuring "large-scale, whole-unit, multi-service, and cross-service branch coordination," which are apparently targeted at Taiwan. Potential modes of operations in the strategic direction of the South China Sea may also be simulated in exercises. To improve the quality of its exercises, the PLA is also considering building a "quasi-battleground" that resembles a specific combat environment.[101] Specialized training grounds and facilities simulating mobile operations for combat troops are likely to be reinforced, while "regional joint delivery training bases" will be built with assistance from the "direction delivery bases" located in the theater commands.[102]

A final area for improvements is passing additional laws and regulations to support civil-military integration in the strategic delivery arena. After issuing the *Law of the People's Republic of China on National Defense Transportation* on September 3, 2016, the mainland Chinese government may formulate the *Civil-Military Integration Development Law*, which will stipulate the duties, relationships, and operating mechanisms of parties involved in civil-military integration.[103] The aim is to integrate efforts toward building better strategic delivery capabilities. As for further ordinances, more specific rules will be made to cover areas such as strategic delivery, military transportation, and traffic war readiness.

Conclusion

In strengthening its strategic delivery capability, the PLA aims to support China's expanding overseas interests. It also hopes to rapidly acquire the ability to invade Taiwan and fight "a quick battle for quick results" so as to prevent any possible foreign intervention. To achieve this latter goal, the PLA must be able to project hundreds of thousands of troops and large amounts of materials to medium- and long-range destinations. However, the PLA's strategic delivery capabilities still have notable weaknesses, including insufficient air and maritime lift, vulnerable ground infrastructure, and an immature joint logistics system.

To overcome those shortcomings, the PLA has been increasing production of heavy air and maritime transport vessels, strengthening coordination between military and civilian authorities, establishing a multi-tiered network of strategic delivery support bases, introducing advanced logistics information technology to enable the rapid transport and delivery of troops and materials, and building an integrated joint command system with key nodes at the CMC and theater command levels. In the coming years, the PLA will attempt to solidify that progress by further strengthening informatization, reinforcing protection for strategic delivery forces, staging more realistic joint drills, and promulgating additional laws and regulations.

For Taiwan's military, the PLA's acquisition of better strategic delivery capability means that the PLA will not only greatly reduce the time it needs to send troops and materials mobilized from around China to sea and land areas surrounding Taiwan but also lower the chance of having its combat rhythm interrupted by delays or mistakes happening in the process of transporting

reinforcements and delivering materials. This situation will put Taiwan's military at a disadvantage in two respects. First, early warning time will be reduced, causing Taiwan to be unable to fully transition the armed forces from a peacetime to a wartime footing, including mobilization of reserve forces. Second, it will be increasingly difficult for the military to take the initiative and get the time it needs to turn the tide of the conflict.

However, this round of PLA reform has affected a wide range of units, and the building of strategic delivery capability involves not only the central government but also local governments and a multitude of private enterprises. This process entails complex information integration, the building of new infrastructure, and improvements to existing infrastructure. In light of these factors, the PLA may need quite some time to upgrade its strategic delivery capability to the level of being capable of launching "joint attack operations against a big island" and "fighting a quick battle for quick results."

The Taiwan military should take advantage of those delays to promote three measures. First, make the transition of the armed forces from a peacetime to a wartime footing more efficient. Second, increase early warning time by strengthening intelligence collection and analysis capabilities. This should focus on grasping early, vital clues about the PLA's would-be mass mobilization of materials and transportation forces. Third, enhance Taiwan's joint suppression warfare capabilities and combine them with cyber and information warfare tools to attack the PLA's strategic delivery nodes and disrupt Beijing's combat rhythm.

Notes

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CHAPTER 3

China's Overseas Base, Places, and Far Seas Logistics

By Isaac B. Kardon

When the People's Liberation Army Navy's (PLAN's) Type 052D guided-missile destroyer *Xining* pulled into the PLAN base at Djibouti for a five-day replenishment stop on September 24, 2019, it had steamed for nearly a month from its home port in Qingdao.[1] *Xining* led the 33rd PLAN Gulf of Aden Escort Task Force,[2] accompanied throughout the 11,000-kilometer journey by a frigate and a 25,000-ton Type 903A comprehensive supply ship able to conduct underway replenishment.[3] This flotilla was the latest iteration of a 12-year-long counterpiracy escort mission that has served primarily to establish the People's Liberation Army's (PLA's) overseas presence and prepare the force—and the international community—for what looks to be an inexorable expansion of the People's Republic of China's (PRC's) military activities well beyond its borders.[4]

Only since July 2017 have these escort task forces enjoyed access to a purpose-built support base [*baozhang jidi*, 保障基地][5] in Djibouti to supply their mission (and ostensibly, to better enable peacekeeping operations in Africa and provide humanitarian and disaster relief across the region).[6] As of February 2020, it is the only such dedicated PLA military facility abroad.[7] Yet the vast expansion of the scope and scale of China's overseas interests [*haiwai liyi*, 海外利益], and

the requirements for the PLA to safeguard those interests,[8] make this single base insufficient to the tasks at hand. According to China's 2019 defense white paper, "to address deficiencies in overseas operations and support, [the PLA] builds far seas forces, develops overseas logistics facilities, and enhances capabilities in accomplishing diversified military tasks."[9] Whether those operations and tasks will require permanent military bases abroad remains to be determined.

This chapter analyzes the status and trajectory of overseas logistics facilities to support PLA operations abroad, focusing on discussions within the PRC strategic community about how to establish an overseas support system without a network of military bases. The approach observed to be taking hold in practice is the strategic strongpoint model, which provides significant support for many peacetime missions but has limited utility for high-end combat.[10] PRC analysts envision limited PLA utilization of a network of commercial port facilities for dual-use functions—largely in the form of logistics and intelligence support for PLAN missions overseas. Although formal military bases abroad would enable greater expeditionary capabilities for PLA forces, the Chinese strategic community remains circumspect about how much this goal should crowd out others. The choice of overt militarization of commercial projects that could facilitate high-intensity combat missions would be a major departure from the "peaceful development" path of commerce-led expansion long favored by the PRC leadership.

The chapter is organized into three main sections. The first section examines Chinese debates over appropriate methods for projecting power abroad. The second section considers proposals for developing strategic strongpoints [*zhanlüe zhidian*, 战略支点], which are distinguished from past models by the deliberate reliance on and integration with commercial facilities built, operated, and/or owned by Chinese enterprises. The third section addresses some of the advantages and disadvantages of this proposed model in light of the requirements for conducting and sustaining operations beyond the mainland and its immediate periphery. The conclusion summarizes the findings and anticipates some geopolitical factors that could drive trends in future PLA overseas basing and logistics.

Overseas Interests and the Demand for Overseas Basing

The advent of the "New Historic Missions" [*xinde lishi shiming*, 新的历史使命] in 2004 was a watershed moment for the PLA. Under this construct, the

Chinese Communist Party explicitly assigned international missions to the Chinese military.[11] Now tasked to "defend China's expanding national interests" and "safeguard world peace," the PLA was given responsibilities that far exceeded its existing expeditionary capabilities.[12] The expectation that forces would operate effectively far from their homeland logistics networks went well beyond the training and experience of a force that had hardly ventured past its national borders in combat.[13] As PRC firms and citizens range widely across the globe in search of resources, markets, and economic opportunities, that commerce-driven expansion has generated strategic liabilities that have fallen to the PLA to address. Those commercial footholds are also the PLA's best chance to make up for its otherwise meager overseas footprint.

The presumed vulnerability of PRC citizens, assets, and supply chains abroad has concerned leaders in China, particularly within the service called on to shoulder the greatest burden in overseas missions: the PLAN. China's navy had ventured abroad since 1985, but typically only to show the flag with single warships and a trailing oiler.[14] The more complex and resource-intensive operations implied by growing PRC overseas activities and corresponding PLA missions have ushered in a transformational shift in the navy's strategy. If the PLA is to protect far-flung civilian investments and personnel across the globe (now estimated at more than 30,000 PRC firms and 5.5 million PRC citizens working abroad, with another 60 million traveling each year),[15] not only would a blue water fleet and auxiliaries be necessary, but so too would infrastructure and doctrine to sustain and coordinate power projection abroad.

If operational requirements were the only consideration, the PLA would have long ago established a substantial overseas logistics network, including dedicated military bases. Strategy, however, is fundamentally political. PLA desires are subordinate to the central party-state's broader geopolitical aims, which have dictated a low-key and incremental approach to the projection of military power abroad. Economic considerations play the preeminent role in most of China's foreign relations. While the PLA's threat assessments may independently shape important contours of China's national security policy, the Chinese Communist Party's priorities are based on more than just operational efficacy for the PLA.[16] Accordingly, the PLA National Defense University's 2015 *Science of Military Strategy* advocates awareness of

the political-military tradeoffs that must inform use of force overseas, instructing PLA leaders to pause before committing to international action:

> *Firstly, weigh the pros and cons and cautiously decide* [if an overseas operation is] *"go or no go"* [shenzhong jueding "qubuqu," 慎重决定"去不去"]. *Diplomacy is no small matter, and the overseas use of military force is far from trivial. Under a given international strategic situation, the determination to deploy forces to conduct peacekeeping, maritime escort, overseas evacuation, or international rescue tasks should proceed from a strategic consideration of national political interests, economic interests, diplomatic interests, and security interests.*[17]

Given these higher-level political concerns, the sensitive question of overseas basing cuts against the PRC's dominant "peaceful rise/peaceful development" international narrative. Establishment of basing and associated logistics has lagged the apparent demand for military operations abroad.[18] China's strategic community has embarked on a sustained search for "innovative overseas support methods" that draw inspiration and caution from several current and historical examples, the post–Cold War United States most prominent among them.[19]

In significant respects, the PRC plan for overseas basing is negatively defined: It is anything but the U.S. model. Chinese analysts are by turns envious and critical of the vast overseas constellation of U.S. military facilities that enable and sustain the forward presence of some of America's most capable military assets across the globe, with a growing concentration in the Indo-Pacific region.[20] India's contemporary force posture and limited basing efforts across the Indian Ocean region also garner substantial attention, but mostly as a strategic problem for China rather than a model from which to learn.[21]

While there is no realistic prospect for the PLA to replicate the U.S. military's basing posture, the logistics elements supporting U.S. overseas military operations are a subject of deep interest to Chinese analysts.[22] China's well-known logistics shortcomings are part of this fascination, spurred on by Chinese leaders' longstanding emphasis on the role of logistics in winning wars.[23] Authors and logistics officers from the PLA Logistics University credit the U.S. military with inventing modern logistics in World War II and effectively adjusting based on feedback from near-continuous warfare since

then.[24] A PLA engineer expressed admiration for the "multiplier effect" afforded by distributed bases that can "provide escort formations with berthing, material replenishment, maintenance, and other services at any time."[25]

While drawing inspiration from certain aspects of the U.S. basing example, the pattern and process of China's development of overseas facilities to support military operations diverge in important ways. The "strategic strongpoint" overseas port model leverages China's particular strengths in foreign infrastructure development and affords its military a variety of novel means to mitigate perceived threats.

A Growing Network of Overseas Strategic Strongpoints

The PLAN base at Djibouti is, to date, the only major overseas facility operated by the Chinese military.[26] There is not another publicly acknowledged, purpose-built PLAN facility until Fiery Cross Reef some 5,000 nautical miles to the east in the South China Sea. In between these points, and—increasingly—elsewhere along critical strategic and commercial sea lanes in the Indian, Pacific, Atlantic, and Arctic oceans, is a burgeoning network of commercial ports built, operated, and/or owned by PRC firms. A lively debate is under way about how these facilities can best serve broader PRC priorities.[27]

These commercial ports—or rather, some undetermined subset of them—are now routinely described as overseas strategic strongpoints[28] within the PRC strategic community, including by top PRC and PLA leadership.[29] The foundation of the concept is often attributed to American authors such as Alfred Thayer Mahan,[30] though the term *strongpoint* is most often considered George Kennan's.[31] Whatever its origins, the model has not been officially defined; instead, it is shorthand for a variety of ideas about how to utilize the growing constellation of Chinese firm–built, –operated, and/or –owned ports across the globe, especially in the Indo-Pacific region. Lacking any short- to medium-term prospect of a mutually supporting network of dedicated overseas military bases, the PLA will have to rely primarily on commercial strategic strongpoints to facilitate its far seas operations.

Expanding PRC Commercial Port Facilities Overseas

There are at least 200 overseas terminals in which a Chinese firm has participated in construction. Ninety-five of these terminals have a Chinese firm as a

terminal operator and/or owner of all or part of the firm holding the terminal lease.[32] PRC state-owned enterprises (SOEs) are involved in over 90 percent of these ports,[33] the lion's share (84 percent) of which are subsidiaries of three central SOEs:[34] China Ocean Shipping Company (COSCO) Shipping Ports, China Merchants Port (CMPort), and China Harbor Engineering Corporation.[35] These firms have built extraordinary capacity and expertise by developing the PRC's own domestic ports and terminals, which account for 31 of the world's top 50 ports by overall cargo tonnage and 7 of the top 10 in terms of container throughput.[36] Hutchison has long been a global player, but since the mid-2000s COSCO and CMPort have emerged as leading global port operators,[37] winning concessions and acquiring equity stakes in overseas terminals scattered across the globe.

The prominence of port development in China's foreign economic policy indicates that there are strong political and financial incentives for these firms to cooperate with the government and, if necessary, the military.[38] The 13th Five Year Plan proposes to "[a]ctively advance the construction of strategic strongpoints along the 21st-Century Maritime Silk Road, participate in the building and operation of major ports along the road, and promote the joint development of industrial clusters around these ports to ensure that maritime trade routes are clear and free-flowing."[39] The official PRC State Council plan for the Belt and Road Initiative (BRI) refers twice to strategic strongpoints, attributing the term to Premier Li Keqiang and his proposals to build the 21st-Century Maritime Silk Road in Southeast Asia and proposing that strategic strongpoints "form an important gateway connecting the Silk Road Economic Belt and the 21st-Century Maritime Silk Road."[40]

Following the commercial incentives (and the political and financial inducements provided by these major policy initiatives), ports built, owned, and/or operated by PRC firms are now distributed widely around the world's principal waterways. The heaviest concentrations are found in the Indian Ocean (27 percent) and Mediterranean (19 percent),[41] with nearly 40 percent of these projects located within 480 nautical miles of a major maritime chokepoint.[42] Analyzed in terms of regions, Europe hosts a plurality of these projects (24 percent), followed by the Middle East–North Africa (21 percent). In short, there is a substantial network of PRC shipping terminals covering geographic areas of major economic and strategic consequence. They are

useful both as transport nodes for shipping and transportation along a maritime route, as well as for their inland connections.[43]

PLA Utilization of Commercial Port Facilities

Reliance on commercial facilities is, by necessity, a feature of PLA doctrine for overseas operations. The 2013 *Science of Military Strategy* states:

> *We must build overseas strategic strong points that depend on the homeland, radiate into the periphery, and move us in the direction of the two oceans* [that is, the Pacific and Indian oceans]. *These sites are to provide support for overseas military operations or act as a forward base for deploying military forces overseas, exerting political and military influence in relevant regions. We should form a posture with the homeland strategic layout that takes account of both the interior and the exterior, connects the near with the far, and provides mutually supporting* [facilities].[44]

In the 7 years since the publication of this authoritative work, substantial progress has been made toward establishing a mutually supporting chain of commercial facilities that could meaningfully shorten the intervals between PLA resupply locations.

One early effort to make sense of the concept and attach the PLA's requirements to broader national strategy was presented at the Maritime Power Strategy Forum held in Xiamen in late 2016. A former PLA engineer and current lecturer at the Dalian Maritime Academy, Zheng Chongwei, presented a detailed schematic of the strategic strongpoint model and offered an "outlook on their functions":

> *comprehensive replenishment, naval ship maintenance, intelligence collection, marine monitoring, humanitarian relief, medical assistance, protection of maritime rights and interests, as well as providing support to military operations and military operations other than war. Establish a series of strategic strong points that will significantly improve naval endurance, which will enhance escort capabilities and sustain combat capabilities. This will guarantee the construction of the "Maritime Silk Road" into an international economic artery and extend the reach of the navy. The robust development of the "Maritime Silk Road" will better demonstrate the importance of the People's Navy and effectively boost the virtuous cycle between the "Maritime Silk Road" and the navy's strategy.*[45]

The extent to which China's commercially operated ports are, in fact, providing (or capable of providing) these desired functions is a subject of ongoing research by PLAN experts and research institutes. At a minimum, the increasing PLAN demand for overseas replenishment is being accommodated at the 95 ports with a PRC firm or joint venture as terminal operator. PLAN vessels have made calls in at least 27 of these ports.[46] These visits occurred at 1 or more terminals at 14 of the 36 ports operated by Hutchison, 11 of the 31 ports owned or operated by CMPort, and 6 of the 19 owned or operated by COSCO.[47] Normal husbanding services are available at most commercial facilities, regardless of the nationality of the terminal operator, but there are distinct synergies between the PLAN and Chinese firms, discussed below.

Then-PLAN Commander Admiral Wu Shengli noted in 2016 that "overseas strategic strongpoint construction has already provided a new support for escort operations."[48] Indeed, the escort mission in the Gulf of Aden has been the principal "consumer" of overseas port calls. Whether these commercial facilities can support more complex, demanding operations remains to be seen. For now, the consensus seems to be that only modest military utilization is prudent. One PLA Academy of Military Sciences researcher summarizes this softer approach and its purported difference from traditional military facilities, stating that "China's overseas strategic strongpoints will not become strongpoints for a hegemonic strategy. Rather, they will provide support for China's efforts to safeguard its overseas interests and create favorable conditions for cooperation between China and countries along the Belt and Road. Its biggest function will be risk prevention, not pursuit of privileges."[49]

The Gulf of Aden escort mission, along with a handful of other noncombat military operations, remains the principal stated purpose for military utilization of these facilities. The political commissar of the Djibouti base, Senior Captain Li Chunpeng, told CCTV that support for China's far seas escort operations is "gradually adjusting from the method of relying mainly on accompanying supply ships and supplemented by foreign ports, to a new model that mainly relies on overseas base(s), with replenishment at other foreign port locations with domestic support."[50] Presumably, he was referring to the expanding role of the Djibouti base in serving the PLA's overseas logistics needs and the burgeoning network of Chinese-operated ports across the Indian Ocean region. Leveraging the vast capacity of China's leading overseas firms shortens the supply intervals

for PLAN vessels, decreasing the strain on its still-limited fleet of supply ships and allowing the PLAN to sustain longer and more resource-intensive operations in the far seas. The degree to which the PLA can exploit the substantial commercial infrastructure and assets that might be available to it in regions of strategic importance is of crucial importance to its expeditionary capabilities.

The Strategic Strongpoint Model: Advantages and Disadvantages

How well do these strategic strongpoints support the PLA's more complex tasks to safeguard China's overseas interests? This is partly a question of coordination among various Chinese bureaucratic players, not only within the PLA, but also between the PLA and the commercial entities operating ports and diplomats, and across the state and party bodies that regulate and administer those firms' overseas activities. Additionally, the PLA's use of a "commercial front" for supporting its overseas operations presents a variety of diplomatic considerations distinct from negotiating a lease on a dedicated military facility. Some debate remains as to whether such a model will ultimately be sufficient for the strategic demands placed on the PLA by the central party leadership.

For now, at least, the PLA's increasing reliance on commercial ports operated by Chinese firms confers certain advantages over the old model of underway replenishment and commercial port calls. These advantages include reduced cost and increased availability of necessary basic supplies, ease of access from a diplomatic and administrative standpoint, and growing availability of facilities that meet certain military standards. However, without purpose-built military infrastructure, disadvantages will persist, including poor support for higher-end operations, vulnerability to domestic politics in the host state, and various civil-military organizational mismatches that are likely to persist even as the PLA gains more experience operating abroad.

Low Cost and Ready Access to Limited Dual-Use Facilities

One advantage of the strategic strongpoint model is reduced cost. The prior pattern for support of far seas operations relied on ad hoc arrangements made with foreign port operators to provide bunkering, water, and other resupply services. The gradual establishment of routinized services at ports operated by Chinese firms is widely expected to drive down the financial costs of PLA operations abroad. The problems of cost overruns, corruption, and general

efficiency across logistics processes has been a perennial concern and is the focus of some of the major organizational reforms to the PLA's joint logistics system.[51] Allowing China's commercial firms to procure commodities such as food, water, and fuel is among several advantages of the strategic strongpoint model, as is the possibility for the military to preposition specialized supplies, if not heavy equipment, at commercial sites.[52]

Such an arrangement is desirable due to onerous domestic processes for PLA units operating abroad to receive approval for procuring supplies. One article in the PLAN's official newspaper estimated that it took more than 20 days to execute a purchase of supplies overseas, giving rise to an "emergency foreign purchase plan" that let the task force commander make the purchase directly from a Chinese firm within 2 days.[53] Firms such as COSCO have offices, personnel, and equipment at ports across the Indian Ocean region, some at terminals they operate themselves. Some PLA logistics officers thus argue that civilian firms' organic capabilities far exceed the PLA's own, and that port calls to facilities operated by those companies "provide a platform for the military to rely on corporate strengths . . . use market economic means, and adopt commercial contract entrustment methods [*shangye hetong weituo de fangshi*, 商业合同委托的方式] to give full play to the advantages of enterprises and realize resource sharing."[54] Whether these savings will be achieved because of "sweetheart" deals, longer-term wholesale contracts, or outright expropriation is unclear. Scholars from the PLA's Transportation University suggest that the PLAN will "establish an incentive mechanism for the requisition of overseas Chinese-funded enterprises, and fully mobilize the enthusiasm of relevant institutions and enterprises."[55] "Mobilizing enthusiasm" may be hard in busy ports where berth space and equipment use by the PLA crowd out commercial use, but there are plausible sources of political leverage that might be exercised by PLA actors.[56]

Some Chinese analysts go further to suggest that reliance on commercial supply is more cost effective than using dedicated military facilities. "From an economic point of view," argues one scholar, "a purely overseas military base is no different from a money-burning machine [*shaoqian jiqi*, 烧钱机器]. Even the United States, which has financial subsidies from allies, cannot afford it for a long time. Therefore, China's overseas port chain of bases [*haiwai ganglian jidi*, 海外港莲基地] should be driven by commercial rather

than military purposes."[57] These scholars' accounting might or might not be correct, but the belief in commercial enterprise as a cost-effective way to supply overseas operations is common. This view is also consistent with the much more concerted efforts under way domestically to achieve civil-military integration on logistics.[58]

A second advantage concerns ease of access for military forces. In contrast to the ad hoc negotiation of port calls with foreign port operators or the cumbersome and long-term establishment of dedicated military facilities, the strategic strongpoint model provides a relatively straightforward institutional interface for PLA forces operating abroad. Because the port infrastructure is operated and/or owned by a Chinese firm, and because diplomatic and political arrangements can be worked out with the host country in advance by PRC leadership, Chinese strategists generally perceive the ease of access to such facilities as an advantage of the strategic strongpoint model.

The high-level demand for "protection and facilitation" of overseas investment by SOEs in particular has brought with it senior leadership visits that drive "overall coordination between various ministries and commissions" and with the governments of states hosting Chinese-operated ports.[59] The leadership priority placed on burnishing the BRI "brand" further means that energetic diplomatic outreach accompanies lavish foreign direct investment by Chinese enterprises. PLA researchers believe this whole-of-government approach facilitates better cooperation with host countries whose "consent, support, and cooperation" are required.[60] Supplying forces overseas involves coordination among the Ministry of Foreign Affairs, Ministry of Transport, banks, customs agents, and various PLA departments, as well as others. However, this coordination is not easily accomplished without high-level brokers.[61] An author from the National University of Defense Technology suggests that "rights to continuous use of overseas facilities" [*haiwai sheshi de chixuxing shiyongquan*, 海外设施的持续性使用权] may require senior PLA leadership to broker the arrangements. One example was Admiral Wu Shengli's signing of an agreement for PLAN visits to Kota Kinabalu in Malaysia in January 2015 that later led to a replenishment stop by a submarine.[62]

Authors from the PLA Transportation University and a staff officer from the Eastern Theater Command tout other institutional advantages of China's approach, favorably comparing Beijing's ability to direct Chinese firms

to Washington's ability to direct U.S. companies to support military operations.[63] In 2010, the deputy chief of the PLAN Operations Department lamented the "uncertainties of foreign berthing facilities" as "limiting factors in the long term regularization of overseas operations" and looked to "Chinese enterprise facilities in overseas ports as the next step in building an 'overseas support system' [*haiwai baozhang tixi*, 海外保障体系]."[64] The 2015 *Science of Military Strategy* spells out how these efforts are to be coordinated:

> *Actively explore building overseas resupply points with Chinese characteristics, sign military agreements with friendly countries, make advance preparations allowing the PLA to use foreign airports, ports, piers, and so on. Take advantage of overseas personnel and SOEs. The PLA should innovate on the defense mobilization mechanisms to make overseas personnel and industry to support overseas operational task forces at designated times.*[65]

The thrust of PLA innovation in this regard appears to be outsourcing complex access issues largely to the Chinese enterprises on the ground. A PLA Logistics Academy scholar suggests that the military can do the following:

> *Rely on the overseas offices established by China's international shipping and transportation engineering construction enterprises in major ports and transportation hubs around the globe. Take advantage of their familiarity with the host nations and their laws, and their good foundation of overseas work. Turn them into supports for assisting and providing overseas transportation through various measures, thereby constructing a national defense transportation system that covers all domestic domains and radiates into distant overseas areas.*[66]

Regardless of how well this coordination task is accomplished, there are numerous other factors that will determine how much the PLA can practically rely on these firms' good offices (addressed in the following section).

A third advantage is that ports may be constructed according to Chinese military standards. There is acute PLA demand for access to civilian facilities and supplies that meet military standards. Beyond fuel, food, and water, the logistics demands become more complex. Not all military equipment can be handled in containers, nor are all ports' harbors, piers, railways, and roads suited for military vessels and vehicles. The concerted efforts to achieve civil-military integration under way in China are not as well advanced abroad,

but the ambition to create functional dual-use facilities overseas will likely drive this process forward.

Domestically, new Chinese laws and regulations facilitate the civil-military integration processes necessary for the PLA to utilize commercially operated facilities at home and abroad.[67] The 2017 National Defense Transportation Law mandates that the "planning, construction, management and use of resources in such transportation fields as railways, roads, waterways, aviation, pipelines, and ports" be coordinated with military authorities.[68] It further directs civilian enterprises to:

> *render assistance in replenishment and rest to Chinese ships, aircraft, vehicles, and personnel carrying out military operations in international rescue, maritime escort and the protection of overseas national interests. Relevant state departments shall facilitate the entry and exit of all the personnel, means of transport, and goods required by the institutions and enterprises specified in the preceding paragraph for assisting overseas military operations.*[69]

The degree to which Chinese enterprises comply with this guidance is difficult to observe directly, but the close linkages between the major port construction firms and the government mean that this task is somewhat easier for the PRC to accomplish than it would be for other states.

Scholars from the PLAN Command College identify some of the specific requirements for building appropriate port facilities to military standards. These requirements include a minimum of two harbor roads and one railway line; good traffic conditions; dual-use oil, water, and electricity supplies; security for the facility; dedicated docks and warehouses; and specialized vehicles for large military equipment.[70] PLA Transportation Academy experts and an Eastern Theater Command officer add that appropriate channel width and depth is required for large transport vessels, as is 10-meter water depth for berths, a storage facility greater than 120,000 square meters (with cold storage/reefer facilities), and roads that can sustain heavy vehicles and equipment.[71] Adequate channel depth and turning radius have only "qualitative requirements" that are then implemented on an ad hoc basis according to consultation with the port construction unit within the National Transportation Readiness Department [*guojia jia tong zhanbei bangongshi*, 国家交通战

备办公室] to determine construction standards. These methods are manpower- and time-intensive and allow "subjective factors to dominate" that make it "difficult to guarantee the quality" and are a shortcoming in China's system relative to the United States.[72] These authors register special concern that roll-on/roll-off piers are insufficient for a great deal of military transportation requirements, in part because there are not enough of them due to relatively low volumes of commercial demand for such facilities (they are required only for commercial automobile transport; piers may not have appropriate heights for the Type 071 PLAN amphibious transport vessels).[73]

These authors nonetheless contend that China enjoys certain advantages in bringing its logistics platforms up to speed. They cite the combination of the 2017 National Defense Transportation Law with the 2010 National Defense Mobilization Law as major steps toward achieving an effective "top-down construction plan" rather than the "bottom-up reporting and top-down approval" that characterized an earlier era. These provisions allow for defense subsidies, special grants, bank loans, government bond issuances, and tax benefits that will incentivize commercial firms to build and maintain ports up to PLA standards. These authors argue that the United States, by contrast, is constrained financially because it lacks special federal funding for infrastructure construction and cannot keep up with military demand.[74]

The explicit comparisons to the United States, however, are not necessarily apt because the operational demands placed on these Chinese-operated facilities are not yet of the scale and complexity of those required to support U.S. military requirements. This well-recognized deficiency flows from the largely noncombat purposes envisioned as the primary operations supported by strategic strongpoints.

Operational and Political Drawbacks of the Model

Although Chinese experts are expending a great deal of analytical effort to understand how best to utilize the growing portfolio of overseas ports operated by Chinese firms, the military is exerting only indirect influence in determining where these projects will be located and how they will be constructed and managed. The pace and scope of PRC port firms' expansion are determined first by corporate actors pursuing largely commercial goals.[75] Their choices are almost certainly influenced more directly by relatively uncoordinated state subsidies

and political encouragement than by any strategic, rational design for expeditionary logistics. As such, the PLA is seeking to leverage this pattern of commercial port development rather than steer it directly. Until the PLA strikes out on its own to develop its own facilities around the world, the various advantages assessed above will be offset by a handful of fundamental disadvantages.

One disadvantage is that, for the foreseeable future, China's overseas logistics hubs will face both technical and political deficiencies in supporting high-end combat missions. This shortcoming, however, has not surfaced in practice because supporting military operations other than war (MOOTW) is the ostensible purpose for the PLA's far seas deployments to date. The lack of forward-deployed units and platforms is only the beginning of the challenge. A fully capable base would feature a military airfield, munitions storage and distribution, piers, maintenance and parts for large warships, intelligence and communications posts, military hospitals, hardened command facilities, surface-to-air missiles, missile defense capability, and any number of other specialized platforms.[76]

To be sure, these shortfalls are consistent with the relatively modest mission set currently assigned to the PLA.[77] PLA authors emphasize that combat is only one of several purposes for an overseas base, noting that diplomatic, political, and training functions are critical.[78] The steady diet of military diplomacy and foreign exercises fed to the PLA reinforces this point.[79] There is little doubt that this is a staged process by design: MOOTW missions are stepping stones toward better fulfilling the "strategic needs of overseas missions."[80] The strongpoint model enables incremental progress toward "continuously strengthening the capabilities for overseas use of military force," in the words of PLA National Defense University analysts, who characterize "improving reconnaissance, replenishment, supply, and support capabilities of military forces in overseas missions"[81] as a first step rather than an endstate.

Nonetheless, as stressed by a member of the Military Transportation Department of the PLA Air Force Service Academy, the "lack of guarantees" for such basic platforms as reliable overseas airfields suitable for military airlift makes even MOOTW a challenge.[82] PLA analysts pay considerable attention to the pitfalls that arise from reliance on a largely commercial logistics model. Most commercial facilities abroad are not built to support military hardware and operations. For example, even if the PLA Air Force had adequate

airlift capacity and capable platforms,[83] the basic insufficiency of overseas access to airfields suitable for strategic airlift presents a bottleneck for the PLA's efforts to go global.[84] A National Defense University of Technology scholar suggests the following:

> [W]*ith the fitting of the Y-20 large transport aircraft, China's ability to use its air forces to conduct military troop projection, evacuation, and disaster relief overseas will be significantly improved. However, there are presently very few airport-type strategic strongpoints suitable for air operations. Leasing or joint use methods can be carried out in the future to obtain airport leases or even establish air support bases in critical regions.*[85]

Other authors state that the PLAN's surface fleet will be unable to sustain high-intensity operations from commercial facilities.[86] The PLA is making progress in strategic airlift and sealift—long a weak spot for the PLA—in terms of platforms and training, but considerable uncertainty remains about the suitability of the commercial airfields and ports for strategic delivery [*zhanlüe tousong*, 战略投送] under all but the most favorable, uncontested conditions (on strategic delivery, see chapter 2 by Chung Chieh and Andrew Yang in this volume).[87] Limited operations such as counterterrorism are the only combat missions that analysts express any confidence can be supported by current PLA access to regional hot spots.[88] Chinese firms' extensive presence in Pakistan, and the perception of an open invitation from the Pakistani government to augment China's military presence, makes that country a most likely test case for limited use of force in the event of a terrorist incident.[89]

The further development of infrastructure that might support more substantial combat operations is certainly on the PLA's wish list. Admiral Wu Shengli stated that "we must give full play to the supporting role of the overseas support system to carry out larger scale missions in broader areas and to shape the situation."[90] Yet the extent to which such larger-scale missions can depend on the existing system, even if it can be more fully developed, remains a major open question. According to some scholars, "if the intensity of China's overseas military operations increases as China's economic, political, and security interests continue to expand, commercial port replenishment is unlikely to be a long-lasting logistical support option."[91] If high-intensity

combat missions abroad become a part of the PLA repertoire, China will likely need to develop a more traditional basing model.

Another factor that makes reliance on commercial facilities a strategic liability is the vicissitudes of local politics in host countries. The PRC applies intensive diplomatic outreach and commercial investment partly to smooth over some of these challenges. Nonetheless, changes in leadership in host nations have put Chinese projects at risk.[92] Further, local opposition in the form of bureaucratic hurdles, labor protests, and even attacks on Chinese personnel is increasingly common. Despite paying lip service to Beijing's "win-win" diplomatic messaging, savvy Chinese analysts have no illusions: "[I]t is inevitable that there will be conflicts of interest with locals. . . . [I]t is impossible to be immune to the local political situation."[93] A spate of cancellations, delays, and adjustments to PRC firms' port projects from Tanzania to Myanmar and even Pakistan provide examples of the potential for disruption based on domestic political factors.

Chinese analysts have long recognized a range of political, economic, legal, and cultural risks that face PRC firms' efforts to build and operate infrastructure abroad, well beyond the practical and managerial difficulties of working in foreign jurisdictions.[94] While Chinese analysts typically assert that PRC firms' investments will benefit host countries, an Academy of Military Sciences scholar recognizes that those investments "will create different levels of mutual benefit and win-win. It is easy to induce opposition and boycotts. . . . China's overseas strategic strongpoint construction is highly prone to suspicion and hostility, especially when it comes to security and sovereignty."[95] President Xi Jinping told an audience in Cairo that "the root cause of turmoil in the Middle East is the lack of development, and the solution also lies in development."[96] This conviction leaves some analysts confident that China's economic development message will shape domestic politics in host countries. One analyst, for instance, argues that "the revitalization of ports is the engine that drives economic development [in developing countries]."[97] Other analysts recognize that even the most persistent "news dissemination and advocacy strategies"—that is, propaganda—cannot reduce the threat of political instability to large-scale projects.[98]

One source of instability is the inherent friction between deployed servicemembers and host-country populations. One scholar cites the powerful opposition generated by cases of sexual assault by U.S. Servicemen in South

Korea and Japan and states that such "unequal overseas military bases imposed on people is like an active volcano liable to erupt at any time. The calm can only be temporary, and the consequences of eruption are unimaginable."[99] Another analyst cites the more mundane issues of noise, traffic disruptions, and labor tensions as causes for domestic political opposition that can complicate the utility of an overseas support point.[100] In some cases, Chinese firms have shown great sensitivity to the potential for domestic political upheaval, as in Sri Lanka, where the much-discussed Hambantota port project contract reportedly includes stipulations that the Sri Lankan navy provide port security and that any military use of the port is expressly prohibited without government approval.[101]

Furthermore, though virtually all Chinese studies of the problem consulted for this chapter recognize the demand for local legal accommodations, few sources clarify the nature of the arrangements between the PLA and host governments for access to Chinese-operated facilities. The agreement reached with the Djiboutian government for leasing and operating the PLA's Djibouti base reportedly resembles the one concluded with the United States.[102] There are also examples of at least temporary status of forces arrangements embedded in China's Shanghai Cooperation Organization agreements as well as its agreements for PLA military exercises with Russia.[103] These are likely not models for commercial ports, so unless all utilization is covert, new methods will need to be developed to secure persistent access despite changing domestic political currents.

China's lack of alliances means that each of these arrangements must be reached ad hoc and without any prior commitment to use PLA forces for the protection of the host country. Even if an alliance relationship does not eliminate the challenges of domestic politics in host countries,[104] the permanent architecture of alliances established by the United States frontloads and bundles some of these complex negotiations over access. China is attempting to strike out on a different path, establishing rich commercial and diplomatic relationships that can plausibly help finesse arrangements for military access. China cannot, however, eliminate the potential for disruptions from domestic political factors outside of Beijing's control.

While exercising due political caution, China's overseas facilities will need to become more militarized if the PLA is to execute the overseas missions it is

assigned. The 2015 *Science of Military Strategy* suggests that further measures will need to be adopted that allow the force to "steadily carry out necessary overseas strategic prepositioning and strengthen the construction of strategic strongpoints," albeit in a "cooperative, mutually beneficial, and win-win manner."[105] These military analysts perceive the risk of overt militarization of Chinese-owned facilities. In their resort to stock platitudes about mutual benefit, though, they give voice to a public relations strategy that may be effective within China but is less persuasive to many foreign audiences.

Further militarization of China's overseas logistics facilities appears quite likely, with benefits that accrue largely in the operational domain. How well this course of action will serve China's wider strategic purposes will depend on how fast and how far this trend proceeds. There are foreseeable direct costs of action to overtly militarize Chinese facilities. These costs may manifest in commercial losses, domestic political responses within host states, and/or balancing by states perceiving a growing threat from China.

Djibouti is the sole extant case of an overtly militarized Chinese facility abroad, but the results are probably not predictive of other potential cases. In the Djiboutian case, the host government is by no means put off by Chinese militarization, given the country's longstanding reliance on hosting foreign militaries to subsidize its budget. Even states that are less reliant on hosting foreign militaries may appreciate any security protection that the presence of a capable foreign military can provide. The mounting debt load on Djibouti might alter its embrace of China's military presence on its soil,[106] but for now it is an enthusiastic recipient of Chinese foreign direct investment and an eager host of a growing contingent of PLA forces.

However, other states might not be so receptive. As noted above, the domestic political risks that inhere in any overseas military presence will increase as that presence becomes more overtly militarized. The same "not in my backyard" reactions from immediately affected communities that have complicated host-country relations with U.S. forces are to be expected in China's case. There is also a high likelihood that a Chinese military presence will be weaponized by opposition politicians accusing incumbents of selling out the country's security to an unscrupulous partner. Given the concealed fashion in which some military use of civilian assets takes place,[107] some of these reactions are likely to occur even without overt militarization.

Other direct costs include specific countermeasures adopted by states that perceive a threat from an expanding PLA overseas presence in their regions. In the Indian Ocean region, where Chinese militarization seems most likely, India is a prime candidate to react by augmenting its own capabilities to balance a growing Chinese military presence. Such actions and responses could produce a classic security dilemma and will likely lead to increased costs and risks for all parties without necessarily producing a net gain in security.

A more muscular and overt PLA overseas basing posture is also likely to do irreversible damage to the PRC "brand" in international affairs. The "noninterference principle," the "peaceful rise (or development)" narrative, and the whole edifice of China's anticolonial, antihegemonic credentials in the developing world stand primarily on the largely accurate perception that the PRC has not undertaken military adventures abroad.[108] The BRI and its corollary, the "community of common destiny" diplomatic appeal, are likewise premised on a belief that China's overseas interests are largely commercial and nonthreatening. China's leaders are acutely aware of the intense scrutiny of the U.S., Indian, and Japanese governments and analysts who detect creeping militarization of Chinese projects.

Overt militarization of a Chinese port (or other) facility overseas would almost certainly give the BRI an indelible black eye (if it has not already sustained one due to Djibouti). The perception that Chinese infrastructure projects are a slippery slope to hosting Chinese military forces could complicate future Chinese investment—not only in the target country, but also across a range of countries that China desires as economic partners. Of course, China will still have plenty of economic appeal and will find receptive trade and investment partners. The damage, however, would be systemic. In the words of a Chinese Academy of Social Sciences scholar, the construction of China's overseas strategic strongpoints entails a "demonstration effect [*shifan xiaoying*, 示范效应] of speaking with facts" that will counteract the "untrue words of Western countries like the United States and Japan using media and NGOs [nongovernmental organizations] to distort our image."[109] The "demonstration effect" of a new Chinese military base would confirm the warnings of the United States and other critics and would potentially rebrand China as just another great power seeking to exploit, rather than develop, vulnerable countries.

Conclusion

This chapter has reviewed the discussion within the Chinese strategic community about the establishment of commercial logistics hubs capable of supporting limited military operations overseas. The PLA is actively exploring methods to exploit a growing portfolio of shipping terminals and intermodal infrastructure built, owned, and/or operated by Chinese firms to meet the growing demand for the military to protect China's overseas interests. Chinese firms (partially) own and operate some 95 ports outside of China, many of them positioned in locations astride vital sea lines of communication and adjacent to critical maritime chokepoints. These firms are global leaders in shipping and transport, providing a ready augmentation to the PLA's otherwise quite limited overseas logistics capability.

The concept of a strategic strongpoint port is under active development across the PRC strategic community and has been taken up at the highest echelons of military and civilian leadership as a viable model for supporting PLA operations abroad. The concept leverages the weight of China's diplomatic and economic clout to establish nodes that facilitate a more expeditionary PLA. Efforts to achieve civil-military integration at home spill over into the overseas projects of Chinese firms, which may be able to construct, manage, and supply facilities in ways that materially enable the many tasks assigned to the PLA.

However, the potential for this model to support higher-end combat missions is limited without major adjustments to the nature and scope of Chinese commercial involvement overseas. Such missions would require, at a minimum, purpose-built, hardened military facilities and standing agreements with host governments to allow the PLA access and use during a conflict. Forward deployment of personnel along with combat platforms such as ships and aircraft, and force protection capabilities such as surface-to-air missiles, would also greatly enhance the PLA's ability to project power into distant theaters. Such fundamental changes to PLA posture will not occur without the establishment of permanent military bases.

In recent years it has become fashionable for nonmilitary Chinese voices to publicly and unapologetically advocate for overseas military bases.[110] China's civilian leadership will likely exercise this option only in the event of a major conflict or contingency for which the PLA's commercially based logistics

system is unsuited.[111] In the meantime, in keeping with its evolving doctrine, the PLA will continue to "establish mechanisms to jointly handle crises and better expand the space for China's military operations overseas,"[112] which will remain focused on narrower tasks. Without a major war, the marginal operational improvements that China might gain from one or two additional bases will not be worth the negative geopolitical consequences.

What are the implications of the strategic strongpoint model for U.S. global interests? Even if China's current overseas port posture cannot sustain combat-ready forces, it creates a number of problems for the United States. The sheer commercial market share of Chinese shipping and terminal operations firms (principally COSCO and CMPort) is one such issue. Beyond the commercial value of cargo and logistics information, there is a military intelligence implication. The growing geographic scope of Chinese firms' portfolios and their concentration in important strategic regions allow those firms (and Chinese military personnel who may be allowed to use their facilities) to collect valuable information about U.S. naval vessels' positions, personnel, supply and technical needs, and operational routines. Such issues have already materialized in Djibouti. U.S. Africa Command leadership has called out Chinese efforts to intrude on the U.S. base at Camp Lemonnier, track and interfere with its overflights, and generally complicate U.S. operations in the area.[113]

Additionally, when these Chinese port facilities are hosted by U.S. partners or allies, they can potentially degrade important security relationships. The 25-year operating concession at the Israeli port of Haifa awarded to the Shanghai International Port Group is a useful illustration. The U.S. Navy as well as other U.S. Government leaders have expressed great dismay over this development and have suggested that the U.S. fleet would no longer call at this key Eastern Mediterranean port.[114] Despite concerted efforts by many in the U.S. and Israeli national security communities, the lease is still scheduled to begin in 2021.[115] U.S. analysts should take the Israeli case particularly seriously: If Israel cannot be persuaded to forego commercial benefits to satisfy U.S. security concerns, what chance is there for the U.S. Government to persuade Sri Lanka or Tanzania to better scrutinize Chinese investments? The implications of Chinese port projects for intelligence-sharing, port calls, and interoperability are significant and may limit the avenues of security cooperation open to the United States.

Moving forward, research should focus on the nature of the contracts and concessions that Chinese firms have negotiated with foreign nations. While there is no viable way to persuade countries to forego Chinese investments in critical infrastructure, there may be ways to mitigate the security impact. The outflow of Chinese capital and technical expertise in infrastructure may even create positive externalities if subprojects or related ventures are not closed to non-Chinese bidders and commercial activity. More broadly, detailed inquiry into the specific bilateral relationships between China and host countries will provide richer insights into the strengths and weaknesses of the strategic strongpoint model. That model's reliance on robust commercial relationships is presumably a strength, but one tempered by the host country's political economy as well as the vicissitudes of the global economy.

Notes

[1] Li Yinchuan [李银川], "The 33rd Escort Task Force of the Navy Berthed in Djibouti Port" [海军第33批护航编队 靠泊吉布提港], *Jiefangjun Bao* [解放军报], September 25, 2019, 4.

[2] *Xining* was accompanied by two other vessels from the North Sea Fleet, the Type 093A comprehensive supply ship *Kekexili* and the Type 054A guided-missile frigate *Weifang*. Zhao Lei, "Navy Sends Its Most Capable Combat Ship on Escort Mission," *China Daily*, September 10, 2019, available at <https://www.chinadaily.com.cn/a/201909/10/WS5d76fe60a310cf3e3556aad1.html>.

[3] For photos of a horizontal underway replenishment in the South China Sea, see "Navy's 33rd Escort Task Force Conducts Its First Underway Replenishment" [海军第33批护航编队首次进行海上补给], Xinhua, September 4, 2019, available at <http://www.xinhuanet.com/photo/2019-09/04/c_1124957304.htm>.

[4] Thorough analysis of this mission and its implications can be found in Andrew S. Erickson and Austin Strange, *Six Years at Sea . . . and Counting: Gulf of Aden Anti-Piracy and China's Maritime Commons Presence* (Washington, DC: Jamestown Foundation/Brookings Institution Press, 2015).

[5] For a detailed analysis of the Djibouti PLA base, see Peter A. Dutton, Isaac B. Kardon, and Conor M. Kennedy, *Djibouti: China's First Overseas Strategic Strongpoint*, China Maritime Report, no. 6 (Newport, RI: China Maritime Studies Institute, April 2020), available at <https://digital-commons.usnwc.edu/cmsi-maritime-reports/6/>. The facility is sometimes called a "logistics and supply base" [*houqin buji jidi*, 后勤补给基地], a "support base" [*baozhang jidi*, 保障基地], or simply a "military base" [*junshi jidi*, 军事基地], by both official and nonofficial sources.

[6] "Transcript of PRC Ministry of Foreign Affairs Spokesman News Conference," PRC Ministry of Foreign Affairs, November 26, 2015, available at <http://www.fmprcc.gov.cn/web/fyrbt_673021/t1318725.shtml>.

[7] U.S. newspapers have reported PLA facilities in Tajikistan and an agreement to construct a naval base in Ream, Cambodia, but these bases are not confirmed. Furthermore, potential sites along China's immediate periphery fall outside the scope of this chapter's focus on the "transoceanic" component of PLA power projection. See Gerry Shih, "In Central Asia's Forbidding Highlands, a Quiet Newcomer: Chinese Troops," *Washington Post*, February 18, 2019, available at <https://www.washingtonpost.com/world/asia_pacific/in-central-asias-forbidding-highlands-a-quiet-newcomer-chinese-troops/2019/02/18/78d4a8d0-1e62-11e9-a759-2b8541bbbe20_story.html>; Jeremy Page, Gordon Lubold, and Rob Taylor, "Deal for Naval Outpost in Cambodia Furthers China's Quest for Military Network," *Wall Street Journal*, July 22, 2019, available at <https://www.wsj.com/articles/secret-deal-for-chinese-naval-outpost-in-cambodia-raises-u-s-fears-of-beijings-ambitions-11563732482>.

[8] PRC State Council Information Office, "China's Military Strategy," May 27, 2015, available at <http://english.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm>.

[9] PRC State Council Information Office, "China's National Defense in the New Era," July 24, 2019, available at <http://www.xinhuanet.com/english/2019-07/24/c_138253389.htm>.

[10] Close analysis of this concept can be found in Conor Kennedy, "Strategic Strong Points and Chinese Naval Strategy," *China Brief*, March 22, 2019, available at <https://jamestown.org/program/strategic-strong-points-and-chinese-naval-strategy/>.

[11] For a discussion of this program that brought about a redefinition of the scope of the PLA's mission, see James Mulvenon, "Chairman Hu and the PLA's 'New Historic Missions,'" *China Leadership Monitor* 27 (2009), available at <https://www.hoover.org/sites/default/files/uploads/documents/CLM27JM.pdf>.

[12] Hu Jintao, "See Clearly Our Armed Forces' Historic Missions in the New Period of the New Century" [认清新世纪新阶段我军历史使命], National Defense Education Web site of Jiangxi Province, December 24, 2004, available at <http://gfjy.jiangxi.gov.cn/yil.asp?id=11349.htm>. For further analysis of these missions, see Daniel Hartnett, "The 'New Historic Missions': Reflections on Hu Jintao's Military Legacy," in *Assessing the People's Liberation Army in the Hu Jintao Era*, ed. Roy Kamphausen, David Lai, and Travis Tanner (Carlisle, PA: Strategic Studies Institute, 2014), 31–80.

[13] For an excellent assessment of the New Historic Missions in light of the whole of Hu Jintao's administration, see Hartnett, "The 'New Historic Missions,'" 31–80.

[14] Michael McDevitt, "PLA Naval Exercises with International Partners," in *Learning by Doing: The PLA Trains at Home and Abroad*, ed. Roy Kamphausen, David Lai, and Travis Tanner (Carlisle, PA: Strategic Studies Institute, 2012), 107; Christopher H. Sharman, *China Moves Out: Stepping Stones Toward a New Maritime Strategy*, China Strategic Perspectives No. 9 (Washington, DC: NDU Press, 2015).

[15] Li Qingsi [李庆四] and Chen Chunyu [陈春雨], "Analysis of China's Overseas Port Chain Basing Strategy" [试析中国的海外港链基地战略], *Regional and Global Development* [区域与全球发展], no. 2 (2019), 125; PRC Ministry of Foreign Affairs, "Foreign Minister Wang Yi Meets the Press," March 9, 2016, available at <https://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1346238.shtml>.

[16] For example, in a report to the Central Committee's Study Session on Foreign Affairs Work in June 2018, President Xi Jinping stressed the "coordination" of military activities with China's broader interests in international affairs. See "Xi Jinping: Strive to Create a New Situation of Diplomatic Power with Chinese Characteristics" [习近平：努力开创中国特色大国外交新局面], Xinhua, June 23, 2018, available at <http://www.xinhuanet.com/politics/2018-06/23/c_1123025806.htm>. For a thorough review of the many facets of the party-army relationship on matters of national security, see Phillip C. Saunders and Andrew Scobell, eds., *PLA Influence on China's National Security Policymaking* (Stanford, CA: Stanford University Press, 2015).

[17] Xiao Tianliang [肖天亮], ed., *Science of Military Strategy* [战略学] (Beijing: National Defense University Press, 2015), 299.

[18] The 2015 *Science of Military Strategy* further notes that "there is a strong demand for forces to go overseas and safeguard national interest. Nonetheless . . . the overseas use of China's military power must closely focus on the strategic needs of the country's 'peaceful development' and the security needs of enterprises 'going global,' and the primary goal of defending the country's development strategy opportunities and safeguarding the country's overseas interests." Ibid., 299.

[19] Ibid., 303.

[20] The Department of Defense's most recent accounting lists some 514 sites, of which 24 are classified as large sites hosting significant capabilities and large numbers of personnel. See U.S. Department of Defense, "Base Structure Report," September 2017, available at <https://www.acq.osd.mil/eie/Downloads/BSI/Base%20Structure%20Report%20FY18.pdf>. Because there are also "initial, temporary, and semi-permanent contingency locations" (Joint Publication 4-04, *Contingency Basing* [Washington, DC: The Joint Staff, 2019], available at <https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp4_04.pdf>) and a variety of obscure contracting arrangements for logistics, the total number is subject to dispute—an advocacy group against U.S. military basing overseas estimates 800 sites in 80 or more countries. See Overseas Base Realignment and Closure Coalition, "U.S. Military Bases Overseas: The Facts," 2018, available at <https://www.overseasbases.net/uploads/5/7/1/7/57170837/fact_sheet_on_overseas_bases_2018_11_27.pdf>. This 800 figure is adopted by several Chinese analysts, for example, Feng Songjiang [丰松江], "New Features in the Development of Modern Overseas Military Bases" [现代海外军事基地发展呈现新特点], *World Affairs* [世界态势], no. 11 (2018), 60.

[21] Li Jian [李剑], Chen Wenwen [陈文文], and Jin Jing [金晶], "Indian Ocean Seapower Structure and the Expansion of China's Sea Power into the Indian Ocean" [印度洋海权格局与中国海权的印度洋拓展], *Pacific Journal* [太平洋学报] 22, no. 5 (2014), available at <http://www.cssn.cn/zzx/wztj_zzx/201406/t20140630_1235402.shtml>. See also Andrew Scobell, David Lai, and Roy Kamphausen, eds., *Chinese Lessons from Other People's Wars* (Carlisle, PA: Strategic Studies Institute, 2011). China's strategic community has looked also to Russia, France, and the United Kingdom, though these cases have less direct bearing on China's present security environment and consequently invite less sophisticated analyses. A 2018 *Global Times* article went through the overseas basing structure of the United States, United Kingdom, and France to underscore this point. Wu Minwen [吴敏文], "Map of Great Powers' Overseas Military Bases" [大国海外军事基地地图], *Huanqiu Shibao* [环球时报], June 6, 2018, available at <http://www.xinhuanet.com/globe/2018-06/06/c_137212406.htm>. British logistics processes during the Falklands war are also a subject of interest. See Ran Ali [冉阿丽], "The Battle of the Falkland Islands—An Example of Logistic Support for Long-Range Cross-Sea Operations" [马岛之战-远距离跨海作战后勤保障的范例], *Jiefangjun Bao*, July 30, 2019, 7, available at <http://www.81.cn/jfjbmap/content/2019-07/30/content_239593.htm>.

[22] Xue Guifang [薛桂芳] and Zheng Jie [郑洁], "Actual Demands and Risk Responses for Building China's 21st-Century Overseas Bases," *Global Review* [国际展望], no. 4 (2017), 104–121. These authors argue that China's geography and the geopolitical circumstances dictate that China "cannot become an overseas hegemonic power" (117), and go on to recite the common refrain that China has no intention of military expansion and power politics.

[23] CMC Chairman and PRC President Hu Jintao gave a speech in 2010 offering "fundamental guidance for the development of PLA logistics" in which he stated, "Modern wars are all about support. Without a strong comprehensive support capability, it is very hard to win combat victory. When logistics support is in place, victory is a sure thing." See "Fundamental Guidance for Development of PLA Logistics—Study Hu Jintao's Important Discussion of Military Logistics Construction" [军队后勤建设发展的根本遵循–学习胡锦涛关于军队后勤建设的重要论述], *China Military Science* [中国军事科学], no. 6 (2010), 25–31, as cited and translated in Abraham Denmark, "PLA Logistics 2004–11: Lessons Learned in the Field," in Kamphausen, Lai, and Tanner, eds. *Learning by Doing*, 299.

[24] Zhang Wei [张巍] et al., "Comprehensive Research on Military Logistical Support and Logistics System" [军事后勤保障与军事物流系统研究综述], *Journal of Military Transportation University* [军事交通学院学报] 21, no. 6 (2019), 54–61.

[25] Han Yue [韩跃], "Comparison of Chinese and American Far Seas Escort Operations Logistical Support Methods" [中美海军远海护航行动后勤保障模式比较研究], *National Defense* [国防], no. 6 (2019), 4.

[26] A space station in Argentina is operated by China Satellite Launch and Tracking Control General, which reports to the PLA's Strategic Support Force. See Cassandra Garrison, "China's Military-Run Space Station in Argentina Is a 'Black Box,'" Reuters, January 31, 2019, available at <https://www.reuters.com/article/us-space-argentina-china-insight-idUSKCN1PP0I2>.

[27] A good review of various strains of thought on this matter is found in a literature review by scholars from the Chinese Academy of Social Sciences: Liu Weidong [刘卫东] et al., "Research Progress in Construction of the Belt and Road" [一带一路建设研究进展], *Acta Geographica Sinica* [地理学报] 73, no. 4 (2018), 620–636.

[28] Sometimes the identical concept is rendered as 支撑点, though the 撑 is increasingly omitted. Translations of this term vary, given the multiple meanings of 支撑点 and 支点, which can mean a "pivot" or "fulcrum" in English. An official translation of the 13th Five Year Plan of the People's Republic of China renders 海上战略支点 as "strategic maritime hubs," though this is a departure from more common translations of the word. The official *Chinese People's Liberation Army Dictionary of Military Terms* has an entry for the term 支撑点, which it translates as "strong point," and for 战略支撑, which it translates as "strategic pillar." See *Chinese People's Liberation Army Dictionary of Military Terms* [中国人民解放军军语] (Beijing: Military Science Press, 2011), 155, 161. These definitions are as follows: "Strong point: Positions that play a supporting role in the defensive area and form a circular defense. Usually refers to the company's defensive position. Divided into front support points and deep support points. It is the basis of the battalion's defense area"; and "Strategic pillar: A collective term for the pillar forces and conditions for achieving strategic goals or maintaining overall strategic stability."

[29] See Isaac Kardon and Conor Kennedy, "A Base by Any Other Name? China's Strategic Strongpoints in the Indian Ocean Region," in *Going Global? The People's Navy in a Time of Strategic Transformation*, ed. Ryan Martinson and Andrew Erickson (Newport, RI: Naval War College Press, forthcoming).

[30] Some Chinese authors attribute the idea to Zbigniew Brzezinski; for example, Zhang Jie [张杰], "Sea Lane Security and the Construction of China's Strategic Strongpoints—Also, an Assessment of the Security of 21st Century Maritime Silk Road" [海上通道安全与中国战略支点的构建-兼谈21世纪海上丝绸之路建设的安全考量], *International Security Research* [国际安全研究], no. 6 (2017), 100–118. Others attribute it to Alfred Thayer Mahan; Liu Lin [刘琳], "Strategic Strongpoints Along the 'Belt and Road' and Building Military Diplomacy" ['一带一路'沿线战略支点与军事外交建设], *World Affairs*, no. 17 (2017), 62 (China Maritime Studies Institute translation).

[31] Thanks to Adam Liff for reminding me of this important Kennan concept. See John Lewis Gaddis, *Strategies of Containment: A Critical Appraisal of American National Security Policy During the Cold War* (New York: Oxford University Press, 1982), 59–64.

[32] Author's database. The 95 operated and/or owned ports are the focus of this article, as well as the subjects of the strategic strongpoint writing, because these are the arrangements that leave a PRC firm with some degree of managerial and operational role at the port.

[33] Hutchison Ports (the port operating as a subsidiary of the massive, private Hong Kong conglomerate CK Hutchison) accounts for all but a small handful of the privately owned and operated Chinese terminals.

[34] Central SOEs [*qiye*, 企业] are the 95 firms under the supervision of the PRC State Council's State-Owned Assets and Administration Commission (SASAC). See PRC State Council, "Central State-Owned Enterprise Directory" [企业名录], November 8, 2019, available at <http://www.sasac.gov.cn/n2588035/n2641579/n2641645/index.html>.

[35] Author's database. A comparable figure (82 percent) based on a smaller sample was presented in a report by a think tank that touts its connections to the central government: Grandview Think Tank Belt and Road Research Group [国观智库政策研究中心 '一带一路' 课题组], "'One Belt One Road' Chinese Overseas Port Projects Strategic Analytical Report" ['一带一路'中国海外港口项目战略分析报告], Grandview Institution [国观智库] (2019), 6.

[36] Data from IHS Markit and Drewry.

[37] These "big three" firms now lead the league tables in the terminal industry in terms of overall container throughput. COSCO is at number 1, Hutchison Ports at number 2, and China Merchants Port (CMPort) at number 7 in 2018, accounting for 13.5 percent, 10.5 percent, and 4.4 percent, respectively, of global throughput of containers. Accounting for "indirect influence" by way of minority equity ownership of other firms' terminals, CMPort is at number 3. See Drewry, *Global Container Terminal Operators Annual Review and Forecast* (London: Drewry, 2019), 18.

[38] According to the deputy governor of the People's Bank of China, the bank and other central organs are supporting special funds and rates for Chinese banks and other lenders to facilitate BRI priorities such as ports. See Chen Yulu [陈雨露], "Writing a New Chapter in 'Belt and Road' Investment and Financing Cooperation" [书写一带一路投融资合作新篇章], *Global Commerce Classic* [全球商业经典], no. 6 (2019), available at <http://www.financialnews.com.cn/zt/ydyl2019/201904/t20190424_158791.html>. For analysis of which firms are getting preferential loans, see Li Xiaojun and Zeng Ka, "To Join or Not to Join? How Chinese Firms View the Belt and Road Initiative," *Pacific Affairs* 92, no. 1 (2019), 5–26. The mechanisms of this state-firm relationship are spelled out in a forthcoming piece by Isaac Kardon and Wendy Leutert, "Pier Competitor: China's Global Port Expansion."

[39] Central Committee of the Communist Party of China, *The 13th Five-Year Plan for Economic and Social Development of the People's Republic of China* (Beijing: Central Compilation and Translation Press, 2016), chapter 51, section 2, available at <http://en.ndrc.gov.cn/newsrelease/201612/P020161207645765233498.pdf>. (This English translation renders 战略支点 as "strategic maritime hubs.")

[40] "Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road" [推动共建丝绸之路经济带和21世纪海上丝绸之路的愿景与行动], issued by the National Development and Reform Commission, Ministry of Foreign Affairs, and Ministry of Commerce of the People's Republic of China, first edition, March 28, 2015, available at <http://en.ndrc.gov.cn/newsrelease/201503/t20150330_669367.html>. (The original Chinese-language version of the plan utilizes the term *strategic strong point* [战略支点], but the English text translates as "strategic propeller" and "strategic anchor").

[41] Aggregating projects in the northern, eastern, and western Atlantic, Atlantic Ocean ports account for 31 percent of the observed projects; aggregating projects from the western, southern, and eastern Pacific, Pacific Ocean ports account for 23 percent. However, the size of those bodies of water means there is wide geographic dispersion of these ports. Indian Ocean and Mediterranean ports are the most concentrated.

[42] Defined as proximate enough to support logistics for aircraft and surface or subsurface vessels operating in and around the chokepoints, within 480 nautical miles (1 day's travel steaming at 20 knots). A professor from the PLA National Defense University identified seven principal strategic corridors for special attention: Hormuz, Malacca, Bab al-Mandeb, Panama, Gibraltar, Black Sea, and Suez; see Liang Fang [梁芳], *On Maritime Strategic Access* [海上战略通道轮] (Beijing: Current Affairs Press, 2011), 213–250. See also a study by the Chinese Academy of Sciences that selects those chokepoints identified as "most important for shipping value" and in "strategic ocean areas": Bering Strait, Panama Canal, Cape Horn, Florida Straits, English Channel, Danish Strait, Greenland–Iceland–U.K. Gap, Strait of Gibraltar, Bosporus/Dardanelles, Suez Canal, Bab al-Mandeb, Cape of Good Hope, Strait of Hormuz, Strait of Malacca, Lombok Strait, and Kurile Islands. Wang Chengjin [王成金] and Chen Yunhao [陈云浩], "Identification of Global Strategic Shipping Pivot" [全球航运战略支点识别], *Bulletin of the Chinese Academy of Sciences* [中国科学院院刊] 32, no. 4 (2017), 348–354, available at <http://www.bulletin.cas.cn/publish_article/2017/4/20170403.htm>.

[43] One Chinese Academy of Social Sciences study conducted a network analysis of the competitiveness of the various ports along the 21st-century maritime silk road and ranked them based on their connectivity, finding variation in these ports' capacity to facilitate development. See Yang Ren [杨忍] et al., "Evaluation of Competitiveness of Important Ports Along the Maritime Silk Road" ['海上丝绸之路'沿线重要港口竞争力评价], *Journal of Geo-Information Science* [地球信息科学学报] 20, no. 5 (2018), 623–631.

[44] Academy of Military Sciences Strategy Research Department, *Science of Military Strategy* (Beijing: Military Science Press, 2013), 254.

[45] Zheng Chongwei [郑崇伟], Gao Zhansheng [高占胜], and Gao Chengzhi [高成志], "The Strategy of Maritime Silk Road in the 21st Century: Construction of Strategic Strong Points" [经略21世纪海上丝路: 战略支撑点的构建], *Proceedings from the 8th Maritime Power Strategy Forum* [第八届海洋强国战略论坛文集], October 21, 2016. Translation by Conor Kennedy.

[46] Author database, including data provided by Phillip Saunders of National Defense University.

[47] For further analysis of these firms' portfolios, see Kardon and Leutert, "Pier Competitor," and Isaac Kardon, "China's Development of Expeditionary Capabilities: 'Bases and Access Points,'" testimony before the U.S.-China Economic and Security Review Commission, February 20, 2020, available at <https://www.uscc.gov/sites/default/files/Kardon_Written%20Testimony_Final.pdf>.

[48] Liang Qingsong [梁庆松] and Wang Yuanyuan [王元元], "The Navy Holds a Seminar on the 8th Anniversary of the Gulf of Aden Escorts" [海军召开亚丁湾护航8周年研讨会], *People's Navy* [人民海军], December 30, 2016, 1. Originally cited and translated by Kennedy, "Strategic Strong Points and Chinese Naval Strategy."

[49] Liu, "Strategic Strongpoints Along the 'Belt and Road' and Building Military Diplomacy," 63.

[50] "Military Report: Special Report on the 70th Anniversary of the Founding of the People's Navy, Guaranteed to Win, Logistical Forces Extend to the Far Seas" [军事报道: 人民海军成立70周年特别报道保障打赢后勤力量向远海大洋延伸], CCTV, April 19, 2019, available at <https://www.youtube.com/watch?v=Z4DyQGgTIjk&feature=youtu.be> at 5:10: "逐步从以补给舰伴随保障为主, 国外靠港为辅的方式, 调整为以海外基地保障为主, 国外其他港点和国内支援为补充的新模式" ("support methods for China's far-seas escorts are gradually adjusting away from a focus on accompanying replenishment ships supplemented by mooring in foreign ports, into a new model focused on overseas base support supplemented by other ports abroad and domestic support").

[51] For a careful overview of this reform process, see LeighAnn Luce and Erin Richter, "Handling Logistics in a Reformed PLA: The Long March Toward Joint Logistics," in *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms*, ed. Phillip C. Saunders et al. (Washington, DC: NDU Press, 2019), 277. See also Liu Zhigang [刘志刚], "We Should Focus on Three Types of Changes in Logistics Reform" [后勤改革要着眼三种转变], *Jiefangjun Bao*, September 9, 2014, available at <http://military.people.com.cn/n/2014/0909/c172467-25621977.html>.

[52] Wang Tianze [王天泽], Qi Wenzhe [齐文哲], and Hai Jun [海军], "An Exploration into Support for Transportation and Projection for Military Bases Abroad" [海外军事基地运输投送保障探讨], *Defense Transportation Engineering and Techniques* [国防交通工程与技术] 16, no. 1 (2018), 33–35. On prepositioning, see also Zhang et al., "Comprehensive Research on Military Logistical Support and Logistics System," 57; and Zheng, Gao, and Gao, "The Strategy of Maritime Silk Road in the 21st Century: Construction of Strategic Strong Points."

[53] Yu Yonghua [余永华], "Lifting Warships Towards the Deep Blue: A Record of a Detachment's Shore Logistics Unit Exploring a Far-Ocean Logistics Guarantee Model" [托举战舰向深蓝: 某支队岸勤部探索远洋后勤保障模式纪事], *Renmin Haijun* [人民海军], September 30, 2010, cited in McDevitt, "PLA Naval Exercises with International Partners," 109.

[54] Liu Dalei [刘大雷], Hu Yongmin [于洪敏], and Zhang Hao [张浩], "Equipment Support in Overseas Military Actions" [我军海外军事行动装备保障问题研究], *Journal of Military Transportation Academy* [军事交通学院学报] 19, no. 9 (2017), 25.

[55] Wang, Qi, and Hai, "An Exploration into Support for Transportation and Projection for Military Bases Abroad," 34.

[56] Beyond the horse trading that may occur in informal fashion, PRC law provides vague permissions for the PLA to requisition supplies and facilities for military purposes: "[A]ny organization or individual has the obligation to accept the expropriation of civil resources in accordance with the law," Article 55 of the National Defense Mobilization Law of the People's Republic of China [中华人民共和国国防动员法], February 26, 2010, available at <http://www.gov.cn/flfg/2010-02/26/content_1544415.htm>. Among significant provisions are "rewards for citizens and organizations that have made outstanding contributions in national defense mobilization" (Article 7, Mobilization Law) and "subsidies or other preferential policies" (Article 24, Mobilization Law). Also see the National Defense Transportation Law of the People's Republic of China [中华人民共和国国防交通法], September 3, 2016, available at <http://www.npc.gov.cn/zgrdw/npc/xinwen/2016-09/03/content_1996764.htm>.

[57] Li and Chen, "Analysis of China's Overseas Port Chain Basing Strategy," 129.

[58] A review of the various lines of effort at an organizational and administrative level is found in Li Haichao [李海超], Xu Zhichao [许志超], and Jia Libo [贾利博], "Support System and Mode of Civil Logistics Enterprises Implementing National Defense Requirements" [民用物流企业贯彻国防要求保障体系与模式], *Journal of Military Transportation University* 21, no. 8 (2019), 58–63.

[59] Sun Degang [孙德刚], "China's Port Diplomacy in Theory and Practice" [中国港口外交的理论与实践], *World Economics and Politics* [世界经济与政治], no. 5 (2018), 13.

[60] Wang, Qi, and Hai, "An Exploration into Support for Transportation and Projection for Military Bases Abroad," 32–34.

[61] Ibid., 33. Xi Jinping himself has visited many PRC firms' port projects overseas, among them China Merchants Port facilities in Sri Lanka and COSCO terminals in Greece.

[62] Hu Xin [胡欣], "The Expansion of National Interests and the Construction of Overseas Strategic Strong Points" [国家利益拓展与海外战略支撑点建设], *Forum of World Economics & Politics* [世界经济与政治论坛], no. 1 (2019), 28. (Kota Kinabalu is not a port with a PRC firm operating a facility, nor is it in the far seas.)

[63] Zhang Jing [张静], Zhang Zhihui [张智慧], and Zhou Jiangshou [周江寿], "Comparison Between China and America in Implementation of National Defense Requirements in Port Construction" [中美港口建设贯彻国防要求对标分析], *Journal of Military Transportation University* 21, no. 4 (2019), 35.

[64] Wang Bin [王滨], "Thoughts on the Construction of Overseas Support Points for Escort Operations" [护航行动海外保障点建设思考], *Navy Magazine* [海军杂志], no. 12 (2010), 2. Cited and translated in Kennedy, "Strategic Strong Points and Chinese Naval Strategy."

[65] Xiao, ed., *Science of Military Strategy*, 304.

[66] Duan Shurong [段树荣], "Preliminary Study on the Development of National Defense Transportation Construction from the Perspective of the Holistic National Security Concept" [总体国家安全观视野下的国防交通建设发展初探], *National Defense*, no. 3 (2017), 72.

[67] As early as 2003, the Central Military Commission promulgated the "National Transport Capacity National Defense Mobilization Regulations," providing a basis for the seizure of civilian transport assets. See PRC State Council and PRC Central Military Commission, "National Transport Capacity National Defense Mobilization Regulations" [民用运力国防动员条例], September 11, 2003 (effective January 1, 2004), Article 2, available at <www.gov.cn/zwgk/2005-05/23/content_178.htm>.

[68] National People's Congress of the PRC, "National Defense Transportation Law of the People's Republic of China," September 3, 2016 (effective January 1, 2017), Articles 2–3, available at <http://eng.mod.gov.cn/publications/2017-03/03/content_4774230.htm>.

[69] Ibid., Article 38.

[70] Gu Yuyuan [顾钧元], Wang Ruiqi [王瑞奇], and Li Zhiqiang [李志强], "Research on Building Civil-Military Integration Systems in Port Logistics" [港口物流军民融合体系构建研究], *Discussion and Research* [探讨与研究], no. 10 (2018), 105–107.

[71] Zhang, Zhang, and Zhou, "Comparison Between China and America in Implementation of National Defense Requirements in Port Construction," 36.

[72] Ibid., 35.

[73] Ibid., 33.

[74] Ibid., 33–34.

[75] The identification of areas where ports will be most competitive is the subject of a great deal of the business and management literature. One study develops a ranking index based on quantitative analysis of 99 major ports, drawing on U.S. Geospatial Information Service World Ports Data. See Yang et al., "Evaluation of Competitiveness of Important Ports Along the Maritime Silk Road," 623–631.

[76] For a detailed analysis of the types of facilities required for the full spectrum of operations, see Christopher D. Yung et al., *"Not an Idea We Have to Shun": Chinese Overseas Basing Requirements in the 21st Century*, China Strategic Perspectives No. 7 (Washington, DC: NDU Press, 2014), available at <https://ndupress.ndu.edu/Portals/68/Documents/stratperspective/china/ChinaPerspectives-7.pdf>.

[77] Authors from the PLA Transportation University cite the following: "The missions of our overseas military bases include: first, providing resupply protection for naval escort formation ships; second, providing effective support for my participation in international peacekeeping and humanitarian relief tasks; third, providing support for implementation of military cooperation, joint training, evacuation of overseas Chinese, emergency rescue, and other overseas non-war military operations; fourth, protecting the safety of our strategic routes and energy supply lines." Wang, Qi, and Hai, "An Exploration into Support for Transportation and Projection for Military Bases Abroad," 33.

[78] Ibid., 32.

[79] Phillip C. Saunders and Jiunwei Shyy, "China's Military Diplomacy," in *China's Global Influence: Perspectives and Recommendations*, ed. Scott D. McDonald and Michael C. Burgoyne (Honolulu, HI: Asia-Pacific Center for Security Studies, 2019), 207–227.

[80] Xiao, ed., *Science of Military Strategy*, 303.

[81] Ibid., 304.

[82] Lu You [吕游], "Research on Building Air Transport Support Capability for Foreign Non-Combat Operations" [涉外非战争军事行动航空运输保障能力建设研究], *Defense Transportation Engineering and Techniques* [国防交通工程与技术], no. 6 (2015), 2.

[83] For a recent assessment of the PLA Air Force's progress toward overseas operations, see Cristina Garafola and Timothy Heath, *The Chinese Air Force's First Steps Toward Becoming an Expeditionary Air Force* (Santa Monica, CA: RAND, 2017).

[84] Lu, "Research on Building Air Transport Support Capability for Foreign Non-Combat Operations," 2.

[85] Hu, "The Expansion of National Interests and the Construction of Overseas Strategic Strong Points," 31.

[86] Li and Chen, "Analysis of China's Overseas Port Chain Basing Strategy," 131–132.

[87] Chen Yu [陈瑜], Li Jiansi [李剑肆], and Zeng Yu [曾宇], "Research on Development of Overseas Strategic Airlift Capability" [境外空中战略投送能力建设研究], *Journal of Military Transportation University* 21, no. 2 (2019), 5–8. See Conor Kennedy, *Civil Transport in PLA Power Projection*, China Maritime Report, no. 4 (Newport, RI: Naval War College Press, 2019).

[88] Ma Yuan [马媛], Song Chunjiang [宋春江], and He Wei [何瀚], "Strengthening the Special Forces Capacity to Participate in Anti-Terrorism Operations Outside the Country," *National Defense*, no. 11 (2017), 64–67.

[89] One Chinese analyst points to the specific risks terrorism poses to the port, transport lines, and Chinese personnel in Pakistan, suggesting that China must "not only be psychologically prepared" for such an event, but also "take precautions and prepare in advance to handle various types of crises." See Hu, "The Expansion of National Interests and the Construction of Overseas Strategic Strong Points," 34.

[90] Admiral Wu Shengli's original quote: "海外战略支点建设为护航行动提供了新支撑. 我们必须充分发挥海外保障体系的支撑作用以便在更大范围更广领域遂行任务塑造态势." See Liang and Wang, "The Navy Holds a Seminar on the 8th Anniversary of the Gulf of Aden Escorts," 1.

[91] Xue and Zheng, "Actual Demands and Risk Responses for Building China's 21st Century Overseas Bases," 107–108.

[92] For instance, China has found it difficult to sustain projects in leadership transitions from Razak to Mathahir in Malaysia, Yameen to Solih in the Maldives, or Rajapaksa to Sirisena in Sri Lanka. See, for example, Amanda Erickson, "Malaysia Cancels Two Big Chinese Projects, Fearing They Will Bankrupt the Country," *Washington Post*, August 21, 2018, available at <https://www.washingtonpost.com/world/asia_pacific/malaysia-cancels-two-massive-chinese-projects-fearing-they-will-bankrupt-the-country/2018/08/21/2bd150e0-a515-11e8-b76b-d513a40042f6_story.html>.

[93] Li and Chen, "Analysis of China's Overseas Port Chain Basing Strategy," 134.

[94] Wan Junjie [万军杰], "Study on the Risk Early-Warning Management System of Overseas Port Construction Project" [海外港口建设项目风险预警管理系统研究] (Doctoral diss., Wuhan University of Science and Engineering, Department of Management Science, 2008).

[95] Hu Xin [胡欣], "Construction of China's Overseas Strategic Strongpoints Must Deal with Five Relationships" [中国的海外战略支点建设需要处理好五对关系], *World Affairs*, no. 3 (2018), 74.

[96] "Seeking Hope on the Path of Dialogue and Development" [在追求对话和发展的道路上寻找希望], *People's Daily* [人民日报], January 25, 2016, 21.

[97] Sun, "China's Port Diplomacy in Theory and Practice," 31.

[98] Hu, "Construction of China's Overseas Strategic Strongpoints Must Deal with Five Relationships," 74.

[99] Li and Chen, "Analysis of China's Overseas Port Chain Basing Strategy," 135.

[100] Hu, "The Expansion of National Interests and the Construction of Overseas Strategic Strong Points," 4–32.

[101] Meg Rithmire and Yihao Li, "Chinese Infrastructure Investments in Sri Lanka: A Pearl of a Teardrop on the Belt and Road," Harvard Business School Case Study N9-719-046 (2019), 11.

[102] A status of forces agreement is not public, but a Chinese analyst from the PLA National Defense University plausibly claims it is modeled on that of the United States. See Feng, "New Features in the Development of Modern Overseas Military Bases," 60–61.

[103] Some scholars advocate expressly for these to serve as a model for other bases and claim that the Agreement of the Shanghai Cooperation Organization Member States on Joint Military Exercises (Article 7) and the Agreement Between People's Republic of China and the Russian Federation on the Temporary Status of Forces in the Other's Territory During Joint Military Exercises (Article 5) provide useful templates for multilateral and bilateral military basing arrangements, respectively. See Xue and Zheng, "Actual Demands and Risk Responses for Building China's 21st Century Overseas Bases," 105–107.

[104] For an incisive study of the politics of countries basing U.S. forces, see Alexander Cooley, *Base Politics: Democratic Change and the U.S. Military* Overseas (Ithaca, NY: Cornell University Press, 2008).

[105] Xiao, ed., *Science of Military Strategy*, 120.

[106] For a detailed review of public debt in Djibouti and other targets of Chinese investment and loans, see John Hurley, Scott Morris, and Gailyn Portelance, "Examining the Debt Implications of the Belt and Road Initiative from a Policy Perspective," Center for Global Development Policy Paper, no. 121 (2018).

[107] An Academy of Military Science scholar articulates this characteristic, stating that "China should mix the military among civilians and use civilians to conceal the military [寓军于民以民掩军]." Liu, "Strategic Strongpoints Along the 'Belt and Road' and Building Military Diplomacy," 64.

[108] "In addition to its principle of noninterference in the internal affairs of the country as its diplomatic and defensive policy principles, China has even more reasons not to establish such a base: it will undermine the image of China's peaceful development and jeopardize China's future economic growth. This is especially true when the base is interpreted as evidence of long-term bad motives in China." Li and Chen, "Analysis of China's Overseas Port Chain Basing Strategy," 136.

[109] Zhou Fangye [周方冶], "A Few Perspectives on the Construction of 21st Century Maritime Silk Road Strategic Strongpoints" [21世纪海上丝绸之路之战略支点建设的几点看法], *International Politics and Economics* [国际政治与经济], no. 2 (2015), 107.

[110] For example, legal scholars from Jiaotong University conclude, "The lack of overseas bases has become an important factor limiting the effectiveness of Chinese military forces, including the Navy. How to build overseas bases is an issue that China cannot avoid." Xue and Zheng, "Actual Demands and Risk Responses for Building China's 21st Century Overseas Bases," 108.

[111] The Libya noncombatant evacuation in 2011 was one such event, and it triggered a great reckoning within the PLA about how to field enough capacity for another such operation far from Chinese bases and logistics networks. The Djibouti base can be understood, in part, as evolving out of this shortfall.

[112] Xiao, ed., *Science of Military Strategy*, 120.

[113] Rear Admiral Heidi Berg, Director, Intelligence Directorate, U.S. Africa Command, "Press Briefing with U.S. Africa Command Senior Leaders," U.S. Department of State, May 30, 2019, available at <https://www.state.gov/press-briefing-with-u-s-africa-command-senior-leaders/>.

[114] "Treasury Joins White House, Pentagon in Warning Israel over Chinese Encroachment," *Jerusalem Post*, January 16, 2019, available at <www.jpost.com/Israel-News/Treasury-joins-White-House-Pentagon-in-warning-Israel-over-Chinese-encroachment-577638>; "U.S. Senate Warns Israel Against Letting China Run Haifa Port," *The Times of Israel*, June 19, 2019, available at <https://www.timesofisrael.com/us-senate-warns-israel-against-letting-china-run-haifa-port/>.

[115] For example, a consortium of U.S. and Israeli retired naval leaders and defense officials penned a report about U.S.-Israeli security cooperation that devotes significant attention to the Haifa port deal. Admiral Shaul Chorev et al., "The Eastern Mediterranean in the New Era of Major-Power Competition: Prospects for U.S.-Israeli Cooperation," Hudson Institute, September 2019, 20–24, available at <http://hms.haifa.ac.il/images/publications/HUDSON/EasternMed_in_New_Era.pdf>.

CHAPTER 4

Command and Control of Overseas Operations in a Reformed PLA

By Phillip C. Saunders

China's latest round of military reforms is driven primarily by President Xi Jinping's ambition to reshape the People's Liberation Army (PLA) to improve its ability to win informationized [*xinxihua*, 信息化] wars and to ensure that it remains loyal to the Chinese Communist Party (CCP). The reforms are unprecedented in their ambition and in the scale and scope of the organizational changes. Virtually every part of the PLA now reports to different leaders, has had its mission and responsibilities changed, has lost or gained subordinate units, or has undergone a major internal reorganization. The relationships between and among the Central Military Commission (CMC) departments, offices, and commissions; the services; and the theater commands (TCs) have all changed.[1] The reforms established new joint command and control mechanisms, and thus have important implications for how the PLA conducts operations within and beyond China's borders.

This chapter first discusses the strategic drivers of PLA efforts to improve the Chinese military's ability to operate beyond China's borders. Deploying and supporting troops beyond China's land borders require different types of weapons and troops; new logistics capabilities; longer range command, control, communications, computers, intelligence, surveillance, and

reconnaissance (C4ISR) support; and appropriate training and doctrine to support power projection missions. Efforts are under way to build these capabilities. The next section provides a framework of the different types of operations the PLA might be required to conduct in the coming years.

The chapter then explores which parts of the reorganized PLA have responsibility for command and control of different types of operations. The postreform PLA organizational structure is intended to give the theater commands primary responsibility for operations and to focus the services on force-building. However, a number of gaps and areas of overlapping responsibility exist that muddy this picture and raise questions about how the PLA will plan and execute different types of operations. The chapter concludes that the postreform command and control mechanisms are workable for now, but they are likely to prove inadequate if PLA overseas operations become larger, require joint forces, last for extended periods, or occur in nonpermissive environments where deployed forces face significant threats. The final section considers how the PLA might create new joint command and control arrangements to better support expeditionary operations, identifying five potential models. Some of those options would require significant additional reforms to command and control structures, especially if the PLA envisions conducting joint warfare in the far seas.

Drivers of PLA Power Projection

A broad trend in the PLA that predated the latest round of reforms is an increasing interest in power projection well beyond China's borders and the First Island Chain. David Finkelstein has described the resulting developments as contributing to an "incipient expeditionary PLA."[2] A number of drivers are supporting this effort.

First, economic interests outside China's borders have grown as a result of the country opening up and expanding trade and investment ties around the world. This has produced new dependencies on foreign markets and foreign sources of raw materials and energy, as well as a significant overseas presence for Chinese companies and People's Republic of China (PRC) nationals, some in unstable places. This situation led Hu Jintao to articulate the "New Historic Missions" for the PLA in 2004, which gave the PLA responsibility for protecting China's economic development.[3] In practical terms, this situation translates into the need for the military to be able to protect China's

sea lines of communication against threats by state and nonstate actors, rescue PRC citizens at risk in unstable environments, protect China's overseas investments, and ensure stability in countries and regions important to China's economic and security interests.[4]

Second, China's leadership has given heightened attention to China's unresolved territorial claims, including Taiwan, the Senkaku/Diaoyu Islands in the East China Sea, and the Spratly Islands in the South China Sea. The substance of these claims has not changed significantly, but previous reform-era Chinese leaders were prepared to downplay them in pursuit of a stable regional environment that supported economic development. A richer China, and one where CCP leaders rely more heavily on nationalist credentials as a source of legitimacy, has resulted in a higher priority on defending Chinese claims (with Xi Jinping telling the U.S. Secretary of Defense that China cannot lose "even one inch of territory") and on expanding China's effective control of disputed maritime territory.[5]

Third, the PLA's services are in increasing competition to develop long-range weapons and expeditionary capabilities. The "New Historic Missions," originally drafted by the CMC General Office's research arm, give the services political justification to develop new capabilities and the doctrine to support them.[6] For the navy, this includes the development of aircraft carriers and an expansion of the marines while adding "far seas protection" to its "near seas defense" mission.[7] For the air force, this includes the development of long-range strike capabilities and a new strategic bomber and a shift to offensive operations and training over water.[8] For the army, this includes a greater emphasis on mobility and the ability to deploy and sustain forces outside their normal operating areas.[9] For the Rocket Force (PLARF), this includes developing long-range conventional missile systems and weapons such as the DF-21D antiship ballistic missile.[10] Such capabilities, which are necessary for the PLA to project power beyond China's land borders, also reflect the modernization goals of the individual military services as well as guidance from CCP leaders.

Fourth, China's civilian and military leaders have sought to expand the PLA's ability to contribute global public goods (such as regional stability and humanitarian assistance) and to support positive relations with other countries and regions. Chinese leaders have highlighted the PLA's positive contributions to regional stability, such as participation in United Nations

peacekeeping operations, counterpiracy operations in the Gulf of Aden, and participation in humanitarian assistance and disaster relief (HA/DR) efforts. These contributions represent an effort to portray expanding Chinese defense budgets and PLA capabilities in a less threatening manner and to make the case for power projection capabilities as necessary for the PLA to contribute to regional and global stability.[11] China has also significantly expanded its efforts to use military diplomacy to engage other militaries and support broader Chinese foreign policy goals.[12]

These four drivers, and the resulting modernization of Chinese military capabilities that they have supported, are producing a PLA that is increasingly active outside China's land borders. Chinese naval activity has increased in the South China Sea, East China Sea, and Indian Ocean, including training deployments of the aircraft carrier *Liaoning*.[13] The PLA Navy has also maintained counterpiracy patrols in the Gulf of Aden since December 2008. The PLA Air Force has increased its training over water in the South China Sea and the East China Sea, including stepped-up operations of H-6 bombers and maritime surveillance aircraft in the Western Pacific, South China Sea, and Sea of Japan (see chapter 5 by Shinji Yamaguchi and chapter 8 by Nathan Beauchamp-Mustafaga in this volume).[14] The PLA has established its first overseas base in Djibouti, participates in nine United Nations peacekeeping operations, and is conducting active military diplomacy efforts that include port calls and a range of bilateral and multilateral military exercises with countries in the Indo-Pacific and in other regions of the world.

This increasing volume of military activity beyond China's borders is placing new demands on PLA command and control mechanisms. The 2013 edition of the *Science of Military Strategy* called for using both cooperative and confrontational military activities to expand China's strategic space overseas; it also noted the need to establish a new joint command system to provide effective support for these activities.[15] The military reforms adopted in 2016 established new national- and theater-level joint command mechanisms and nominally removed the services from an operational command role.

Types of Overseas Operations

Before discussing the reforms in detail, it is useful to outline potential PLA overseas operations. These can be grouped conceptually into four broad

categories: border contingencies, near seas operations and contingencies, "theater-plus" contingencies, and far seas operations and contingencies. *Border contingencies* involve potential conflicts with countries that share land borders with China; each theater command (TC) conducts planning and training for those contingencies within its area of responsibility. Border contingencies may involve interventions or major combat operations in neighboring countries; the term does not connote only skirmishes over disputed borders. *Near seas operations and contingencies* take place in the South China Sea, the East China Sea, and the Yellow Sea. The Southern, Eastern, and Northern TCs (and their naval components) conduct near seas operations within their respective areas of responsibility. *"Theater-plus" contingencies* lie primarily within one theater command's geographic area of responsibility but require either significant assets not under the theater commander's control or supporting operations that take place outside that area of responsibility. The latter case may involve multi-theater operations, such as would be needed in a Taiwan contingency.

Far seas operations and contingencies take place beyond the First Island Chain and thus appear to lie beyond the areas of responsibility of the theater commands.[16] These include traditional blue water navy missions such as protection of sea lines of communication as well as a range of smaller nontraditional security missions. In addition to these larger operations and contingencies, the PLA also conducts military operations other than war that involve regularly deploying smaller quantities of military forces outside China's borders, both within and beyond the Indo-Pacific region. These include conducting military diplomacy, peacekeeping operations, HA/DR, and noncombatant evacuations. The table summarizes command and control responsibilities for each type of overseas operation.

Division of Labor in a Reorganized PLA

In order to improve the PLA's ability to conduct joint operations, the reforms revised the division of labor within the PLA, with the CMC providing general management [*junwei guan zong*, 军委管总], the theater commands focusing on operations [*zhanqu zhu zhan*, 战区主战], and the services managing force-building [*junzhong zhu jian*, 军种主建].[17] In principle, operations should be conducted using either the new national-level joint command and

Table. PLA Overseas Operations

Type of Operation	Command and Control	Operational Forces	Examples
Border contingencies	Theater commands (TCs) CMC retains control over PLARF nuclear and strategic capabilities Service HQs for strategic capabilities (e.g., aircraft carriers, bombers, paratroopers, ASBMs)	TC armies TC navies TC air forces PLARF conventional forces	The four TCs with land borders plan and train for specific contingencies within their geographic areas of responsibility
Near seas operations and contingencies	Theater commands Coast guard HQ Air force HQ for bomber operations?	TC navies TC air forces Coast guard Maritime militia	Southern TC controls South China Sea operations Eastern TC controls East China Sea operations Northern TC controls Yellow Sea operations
"Theater Plus" contingencies	Theater commands for main effort CMC and/or service HQs for "plus" part of large-scale operations? CMC for commanding multitheater operations	TC armies TC navies TC air forces PLARF conventional forces Service strategic capabilities (aircraft carriers, bombers, paratroopers, ASBMs)	Western Pacific and Far Seas aspects of a Taiwan contingency (Eastern TC has lead for main effort) Naval aspects of an India contingency (Western TC has lead for main effort)

Type of Operation	Command and Control	Operational Forces	Examples
Far seas operations and Contingencies	Navy HQ CMC Joint Staff Development	Navy Other services and Strategic Support Force in supporting roles	Counter-intervention operations Sea lines of communication (SLOCs) protection Counterpiracy deployments and port calls Djibouti base
Military diplomacy	CMC Training and Administration Department (joint exercises) Service HQs (single service exercises) CMC Office of International Military Cooperation (liaison)	Army Navy Air force	Chinese participation in Russian Vostok 2018 joint exercise PLAN and Russian Navy Joint Sea 2017 combined naval exercise in the Sea of Japan and the Sea of Okhotsk
Peacekeeping operations (PKOs) Humanitarian assistance/ disaster relief (HA/DR) Noncombatant evacuations (NEOs)	CMC/JSD Overseas Operations Office (current PKOs, HA/DR, and NEOs) Chinese Ministry of National Defense Peacekeeping Affairs Office (PKOs) Air force HQ (2011 NEO) Navy HQ (2015 NEO)	Army Navy Air force	PLA engineer, medical, and infantry units and observers have deployed to UN PKOs in Africa and the Middle East China delivered supplies and provided assistance to Indonesia after an earthquake and tsunami struck in September 2018 China evacuated 35,000 Chinese nationals from Libya in 2011 PLAN evacuated around 600 Chinese citizens from Yemen in 2015

control mechanism under the CMC's Joint Staff Department (JSD) or theater-level joint command and control mechanisms.

However, in practice, there appears to be more diversity in which organizations command PLA operations, with different organizations taking the lead for different types of operations. The CMC retains control over nuclear and some nonnuclear strategic capabilities, likely exercising this authority through the JSD and its Joint Operations Command Center in the Western Hills. Some overseas operations, such as Chinese units participating in United Nations peacekeeping operations, appear to be under the supervision of the JSD Overseas Operations Office [*haiwai xingdong chu*, 海外行动处]. Other operations, such as Chinese antipiracy operations in the Gulf of Aden, appear to remain under the control of the relevant service headquarters (in this case, navy headquarters). The services likely also retain responsibility for planning and executing exercises with foreign militaries under the supervision of the CMC Office of International Military Cooperation. Unlike the other services, the PLA Rocket Force and the Strategic Support Force (SSF) combine both operational and force-building responsibilities in a single organization.[18]

Theater Commands: Playing Well with Others?

The new theater commands play a central role in the PLA's new joint command and control arrangements, but uncertainties about how much authority the theater commanders will exercise might limit their effectiveness for some geographically dispersed and higher end contingencies. Each theater command has responsibility for a specific set of contingencies, which includes planning and joint training in peacetime and commanding operations in wartime. The new theater joint command and control structure, with the theater commands exercising control of ground, naval, and air forces through service-specific theater component headquarters, rectifies a major problem with the pre-reform command and control structure, where the military region headquarters did not have peacetime command of naval, air, and missile units within its area of responsibility.[19] The new construct should be much better suited to joint planning, training, and operations. There have been significant growing pains as the theater commands and their components adjust to new command relationships and learn how to work together, but the basic joint command structure appears to be workable.

The shift from seven military regions to five theater commands has helped clarify responsibilities for border contingencies and near seas operations. For example, in the pre-reform system the Jinan and Shenyang military regions both had responsibilities in a Korea contingency, and the Guangzhou and Chengdu military regions had responsibility for different parts of Southeast Asia. In the postreform PLA, each theater command has responsibility for specific contingencies based on geography. The Eastern TC has responsibility for Taiwan, Japan, and the East China Sea; the Northern TC has responsibility for Korea and the Yellow Sea; the Western TC has responsibility for India (as well as for contingencies involving Central Asia, Pakistan, and Afghanistan); and the Southern TC has responsibility for Southeast Asia and the South China Sea. The Central TC, now commanded by an air force officer, would have responsibility for defending the capital in a conflict and would serve as a source of reserve forces to support other theater commands.[20]

For most border or near seas contingencies, the relevant theater commander would have command of PLA forces operating inside and across China's borders in executing the war plan. However, it is not clear how far each theater command's area of responsibility extends beyond the border or whether the theater commander would have command of geographically dispersed support operations. The Southern TC's responsibility for the South China Sea already requires conducting near seas air and naval operations that extend far away from mainland China. However, in the event of a Taiwan contingency, the PLA Navy may be tasked to operate even farther into the Western Pacific (what this chapter calls a theater-plus contingency). It is not clear whether the Eastern TC, PLA Navy headquarters, or CMC JSD would have operational control over naval forces operating far out in the Western Pacific. Similarly, if China was concerned about U.S. military intervention in a Korea conflict, Beijing might deploy air and naval forces into the Yellow Sea and Sea of Japan to deter and defend against U.S. air and naval forces. A Chinese conflict with India would likely entail naval operations in the Indian Ocean, but the Western TC has no naval component to take charge of the naval fight.[21] Presumably, navy headquarters or the CMC JSD would take on those responsibilities, challenging the principle of unity of command and raising the issue of how the PLA would coordinate land and naval operations in different theaters.

The reforms established joint command and control structures at both the national level (under the CMC JSD) and the theater level (the theater commands) for assigned ground, naval, and air force units. However, important questions remain about the relationships between the CMC JSD and the theater commands and about how theater commanders will tap nuclear and nonnuclear strategic capabilities that remain under CMC control. The precise division of labor and the willingness of the CMC to delegate assets and decision authority to the theater commander in wartime remain unclear. The Rocket Force reportedly has at least 100 officers assigned to the five theater commands, and theater commanders will have operational control over conventional Rocket Force units in their theaters in wartime.[22] However, the CMC will retain decision authority over nuclear weapons and will likely also exercise tight control over longer range systems with strategic impact, such as antiship ballistic missiles.[23] The SSF will provide strategic space, cyber, electronic, and psychological warfare support to theater commands, but the planning mechanisms and operational command relationships through which this support will be delivered are unclear (see chapter 6 in this volume by John Chen, Joe McReynolds, and Kieran Green).[24] One hint is a reference to an SSF Eastern Theater base, which suggests that the SSF might establish support bases in each theater,[25] similar to the Joint Logistic Support Force model.[26]

Will the JSD (acting on behalf of the CMC) view its role primarily as providing supporting strategic capabilities (such as antiship ballistic missiles, intelligence derived from space and cyber systems, counterspace and offensive cyber capabilities, and long-range precision strike) to help a theater commander execute the war plan?[27] Or will the JSD (run by a CMC-member–grade officer senior to the theater commanders) attempt to micromanage the theater's operations? The prevailing PLA organizational culture emphasizes caution and deference to authority, rather than taking responsibility for actions not fully vetted with more senior leaders.[28] The notion of empowering military officers to exercise initiative to carry out the intent of their commanders (known in U.S. parlance as *mission command*), which is integral to some Western militaries, is not culturally accepted in the PLA at present.[29] Integrated communications systems and a common operational picture provide both opportunities for timely support with national-level strategic capabilities and temptations to intervene in

the decisions of subordinate commanders. The need to control escalation in a conflict—what the PLA calls *war control*—and the need to integrate operations in other theaters to support the primary theater may provide incentives (or excuses) for the JSD to assert its authority over the theater commander leading the conflict.[30]

Service Headquarters: Keeping a Hand in Operations?

Another question concerns the role of the services. In principle, the reforms removed the service headquarters from operations, but in practice all of them have held onto some operational command responsibilities, including some relevant for overseas operations. Army headquarters retains responsibility for border and coastal defense; navy headquarters supervises the counterpiracy patrols in the Gulf of Aden; air force headquarters retains centralized control of bomber, transport, and airborne operations; and the Rocket Force has operational control over strategic forces. Moreover, all the services are using service training requirements (including single-service, multi-theater exercises) as a means of asserting a continued operational role. The theater command army, navy, and air force component commanders report both to the theater command headquarters for operations and to their service headquarters for administration and service-specific training requirements. How they will reconcile competing (and potentially incompatible) demands remains to be seen.[31]

There is ample evidence of interservice rivalry and competition for missions and resources relevant to overseas operations. Ian Burns McCaslin and Andrew Erickson discuss how the higher priority accorded to the maritime domain by Xi Jinping has prompted efforts by the air force, Rocket Force, and even the army to develop and showcase capabilities relevant to near and far seas maritime operations.[32] Similar trends are evident in long-range precision strike, where the navy, air force, and Rocket Force all have systems that perform similar missions.[33] Especially in an environment where military budgets are growing more slowly, interservice competition over missions and resources may impede operational cooperation and complicate efforts to rationalize command and control relationships.[34] This may also be the case in the nuclear domain as the PLA Navy's submarine-launched ballistic missile–equipped nuclear submarines become operational and if the PLA Air Force develops nuclear capabilities.[35]

There is a real tension between the desire of the services to maximize their budgets and independent capabilities and the needs of theater commanders for trained forces that can work jointly. Will the removal of the service commanders from the CMC eventually allow that organization to become a genuine joint staff that can override parochial service considerations in order to maximize PLA joint operational capabilities?[36] Or will established service cultures and organizational interests lead the services to resist pressure for greater jointness and impede the development of a joint force that maximizes PLA combat effectiveness?

Command and Control in a Future Expeditionary PLA

One future requirement that the recent PLA reforms did not fully address is the potential need to command and support a broader range of military operations beyond China's borders (including theater-plus contingencies and large-scale far seas operations). In the past several decades, PLA overseas operations have been limited to participation in United Nations peacekeeping operations, counterpiracy patrols in the Gulf of Aden (since December 2008), short-term deployments to participate in international military exercises and conduct military diplomacy, and a few noncombatant emergency evacuations.

The PLA is devoting considerable effort to developing power projection capabilities, doctrine, and political justifications that would support expeditionary operations well beyond China's land borders and outside the Second Island Chain (see chapter 1 by Kristen Gunness and chapter 3 by Isaac Kardon in this volume).[37] The new logistics base in Djibouti improves the PLA's ability to sustain peacetime naval operations in a permissive environment and provides a nascent capability to support other types of operations that might involve a combat role.[38] These operations are justified domestically by the need to protect China's overseas interests and internationally by the claim that the Chinese military can provide public goods and contribute to international stability.[39]

The theater commands are better equipped to respond to a range of border and near seas contingencies than was possible under the pre-reform military regions. However, their ability to plan and execute operations has geographic limits depending on their area of responsibility and the specific contingencies they are assigned.[40] The exact nature of those assigned areas is unknown; the official map of the theater command areas of responsibility

shows no boundaries outside Chinese land territory.[41] Unlike the U.S. military, which assigns every part of the world to a geographic combatant command responsible for contingency planning and operations within its respective region, the PLA has gaps where potential operations fall outside the designated areas of responsibility of the five theater commands. The PLA does not appear to have established a standing or ad hoc joint task force mechanism to command such operations.

To date, most PLA far seas operations (such as the evacuation of Chinese citizens from Libya in 2011 and Yemen in 2015) have been small, of short duration, and in relatively permissive environments.[42] These types of operations are currently assigned either to the CMC JSD or to one of the service headquarters, depending on the nature of the operation. However, these mechanisms are likely to prove inadequate if PLA far seas operations become larger, require joint forces, last for extended periods, or occur in contested environments with threats from hostile state or nonstate actors.[43] Conducting multiple simultaneous overseas operations would further stress the PLA's ability to command overseas operations. If the PLA begins to regularly conduct such operations, new joint command and control mechanisms will likely be necessary.

There are at least five potential solutions: Allow the service headquarters to continue commanding far seas operations; extend theater command areas of responsibility to fill gaps; establish a new "global command" to handle the rest of the world; strengthen the Joint Staff Department's operational command capabilities; or develop new joint command and control mechanisms along the lines of U.S. ad hoc and standing joint task forces. These options are not necessarily mutually exclusive.

- Allow service headquarters to command far seas operations. The path of least resistance would be to allow the service headquarters to maintain command responsibilities for far seas operations that lie outside the areas of responsibilities of the theater commands. This appears to be the current PLA practice, with PLA Navy headquarters in charge of counterpiracy deployments in the Gulf of Aden and China's logistics base in Djibouti. The advantage is that the navy already has some experience and the communications hardware necessary to command these operations.[44] However, this solution runs counter to the logic of the reforms and is not well suited to conducting operations that involve multiple

services or that require significant deployments of ground forces far from China's borders.[45] Moreover, the other services are likely to resist navy dominance of an overseas mission set likely to expand in the future.

- Extend theater command responsibilities. The PLA could follow U.S. practice and assign every country and region in the world to one of its theater commands. This would clarify responsibilities and allow the theaters to gradually extend their joint command and control and communications capabilities farther from China's borders.[46] However, the theater commands are relatively new entities that appear to have their hands full dealing with their existing responsibilities. Moreover, this arrangement would require duplicating C4ISR capabilities across the theater commands and risk creating seams across the expanded theater command areas of responsibility that would complicate global operations.
- Establish a new "global command." An alternative would be a new global command that would handle far seas contingencies and other overseas operations that lie outside theater command areas of responsibility.[47] This could build on lessons learned from the theater commands; avoid duplication of costly long-range C4ISR capabilities; and (if based in Beijing) potentially benefit from synergies and ease coordination challenges with the Foreign Ministry and other government agencies, Chinese intelligence services, and strategic airlift and sealift capabilities controlled by the service headquarters. A global command would require a significant investment in terms of personnel, equipment, and facilities. Unlike the theater commands, a global command might not have service component headquarters or permanent forces assigned, which could impede training and operations.
- Strengthen the Joint Staff Department's operational command capabilities. Another solution would be to strengthen the JSD's ability to command multiple and larger scale far seas operations. This would require a significant expansion of the size and staffing of the Joint Operations Command Center. The advantage is that this capability could expand incrementally as the pace of PLA overseas operations grows. Disadvantages include potential overload, possible interference with

JSD responsibilities to command national-level assets in a major war, and questions about whether the Joint Operations Command Center is well suited to exercise tactical command and control over operations halfway around the world.

- Develop new joint task force mechanisms. Another solution would be to follow U.S. practice and develop new ad hoc and standing joint task forces. This is a flexible solution that allows for assigning ongoing responsibilities to a standing task force (to take the burden off the JSD and its Joint Operations Command Center) and for establishing and disestablishing ad hoc joint task forces as necessary. One obvious obstacle is that the PLA officer corps is new to joint operations. It is not clear how many senior PLA officers would be capable of effectively commanding a joint task force or how many mid-level officers could serve as capable staff. This problem may ease over time as the PLA gains more experience planning and conducting joint operations at the theater level.

Conclusion

Xi Jinping's ambitious organizational reforms constitute a "remaking of the PLA" that has changed how the PLA is organized and how the different parts of the postreform PLA interact with each other.[48] Although the reorganization is largely complete, the reforms are still a work in progress, with the CMC, theater commands, services, and support elements such as the SSF and the Joint Logistic Support Force working out how they will operate together in practice. Some pre-reform practices—such as the navy's command of Gulf of Aden counterpiracy missions—are continuing even though they are at odds with the organizational logic of the reforms. The current diversity of command and control arrangements might reflect conscious decisions, transitional arrangements that could change in the future, or a struggle between different parts of the PLA over roles and missions. There are a number of gaps and areas of overlapping responsibility that raise questions about the PLA's ability to achieve unity of command.

The pace of PLA modernization continues to accelerate, and past constraints on overseas operations (such as the policy of no overseas bases) are eroding. At the same time, the political, economic, and strategic demands

for the PLA to operate beyond Chinese borders to protect and advance Chinese interests are increasing as projects such as the Belt and Road Initiative are implemented. The next transformation of the PLA will involve integrating power projection capabilities such as carrier battle groups, amphibious and expeditionary forces, long-range transport and strike capabilities, C4ISR, advanced logistics support, and overseas bases into a still-emerging concept of global operations. As the PLA begins to conduct larger and more sophisticated joint operations and expands the range and scope of its overseas operations, experience is likely to reveal the need for additional adjustments to joint command and control mechanisms to fully support China's growing military ambitions and increasingly global PLA operations.

The author thanks Major Ryan Neely, USA, Melodie Ha, and Jonah Langan-Marmur for research assistance and Elizabeth Hague, Michael Coullahan, Dr. Joel Wuthnow, and Dr. T.X. Hammes for helpful comments on previous drafts.

Notes

[1] For a comprehensive analysis of the reforms, see Phillip C. Saunders et al., eds., *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms* (Washington, DC: NDU Press, 2019).

[2] David Finkelstein, *Commentary on China's External Grand Strategy* (Arlington, VA: CNA, January 2011), 6–7.

[3] Daniel Hartnett, *Towards a Globally Focused Chinese Military: The Historic Missions of the Chinese Armed Forces* (Alexandria, VA: CNA, June 2008).

[4] Mathieu Duchâtel, Oliver Bräuner, and Zhou Hong, *Protecting China's Overseas Interests: The Slow Shift Away from Non-Interference* (Stockholm: Stockholm International Peace Institute, 2014).

[5] Thomas Gibbons-Neff and Steven Lee Myers, "China Won't Yield 'Even One Inch' of South China Sea, Xi Tells Mattis," *New York Times*, June 27, 2018, available at <https://www.nytimes.com/2018/06/27/world/asia/mattis-xi-china-sea.html>.

[6] Hartnett, *Towards a Globally Focused Chinese Military.*

[7] Christopher H. Sharman, *China Moves Out: Stepping Stones Toward a New Maritime Strategy*, China Strategic Perspectives No. 9 (Washington, DC: NDU Press, 2015).

[8] Mark R. Cozad and Nathan Beauchamp-Mustafaga, *People's Liberation Army Air Force Operations over Water: Maintaining Relevance in China's Changing Security Environment* (Santa Monica, CA: RAND, 2017).

[9] See John Chen, "Choosing the 'Least Bad Option': Organizational Interests and Change in the PLA Ground Forces," in Saunders et al., eds., *Chairman Xi Remakes the PLA*, 85–124.

[10] See David M. Logan, "Making Sense of China's Missile Forces," in Saunders et al., eds., *Chairman Xi Remakes the PLA*, 393–436.

[11] The 2012 defense white paper is an excellent example of China's efforts to connect expanded PLA capabilities with a greater ability to contribute to stability. *The Diversified Employment of China's Armed Forces* (Beijing: State Council Information Office of the People's Republic of China, April 16, 2013).

[12] Kenneth Allen, Phillip C. Saunders, and John Chen, *Chinese Military Diplomacy, 2003–2016: Trends and Implications*, China Strategic Perspectives No. 11 (Washington, DC: NDU Press, July 2017).

[13] Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China 2018* (Washington, DC: Department of Defense, 2018), 30–32.

[14] Ibid., 118–120.

[15] Academy of Military Science Strategy Research Department, *Science of Military Strategy* [战略学] (Beijing: Military Sciences Press, 2013), 120, 249.

[16] It is not clear whether operations in the Philippine Sea, which lies between the First and Second Island Chains, are the responsibility of Southern Theater Command, PLA Navy headquarters, or the CMC Joint Staff Department.

[17] "Central Military Commission Opinion on Deepening National Defense and Armed Force Reforms" [中央军委关于深化国防和军队改革的意见], Xinhua [新华网], January 1, 2016, available at <http://news.xinhuanet.com/mil/2016-01/01/c_1117646695.htm>.

[18] See John Costello and Joe McReynolds, "China's Strategic Support Force: A Force for a New Era," in Saunders et al., eds., *Chairman Xi Remakes the PLA*, 437–518.

[19] See Edward Burke and Arthur Chan, "Coming to a Theater Near You: Command, Control, Forces, Etc.," in Saunders et al., eds., *Chairman Xi Remakes the PLA*, 227–256.

[20] Joel Wuthnow and Phillip C. Saunders, *Chinese Military Reform in the Age of Xi Jinping: Drivers, Challenges, and Implications*, China Strategic Perspectives No. 10 (Washington, DC: NDU Press, March 2017), 17–18.

[21] The Western TC had no naval officers assigned to its staff prior to 2018, but at least one PLA Navy officer was recently assigned to the TC staff. Personal communication from a U.S. Navy officer, May 2019.

[22] Zhang Hui, "PLA Rocket Force Names 100 Officers to Commands," *Global Times*, April 12, 2016, available at <www.globaltimes.cn/content/978291.shtml>.

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[24] See Costello and McReynolds, "China's Strategic Support Force," 437–519.

[25] See citation in ibid., and chapter 6 by John Chen, Joe McReynolds, and Kieran Green in this volume.

[26] See LeighAnn Luce and Erin Richter, "Handling Logistics in a Reformed PLA: The Long March Towards Joint Logistics," in Saunders et al., eds., *Chairman Xi Remakes the PLA*, 257–292.

[27] For a pre-reform discussion of what these capabilities are and how they might be applied in a contingency, see Mark Stokes, "Employment of National-Level PLA Assets in a Contingency: A Cross-Strait Conflict as Case Study," in *The People's Liberation Army and Contingency Planning in China*, ed. Andrew Scobell et al. (Washington, DC: NDU Press, 2015), 135–158.

[28] Roger Cliff, "Chinese Military Reforms: A Pessimistic Take," *Joint Force Quarterly* 83 (2016), 53–56.

[29] Eitan Shamir, *Transforming Command: The Pursuit of Mission Command in the U.S., British, and Israeli Armies* (Stanford, CA: Stanford University Press, 2011).

[30] Thanks to Michael Coullahan of U.S. Indo-Pacific Command for highlighting this point.

[31] Wang Weixing [王卫星] argues that the power of U.S. geographic combatant commanders to override service personnel assignments and to appeal directly to the Secretary of Defense for resources and authorities is an important source of U.S. military operational success, implicitly arguing for empowering theater commanders over the services. See "Improving Operating Effectiveness of Joint Command and Control Mechanisms" [联合作战指挥体制如何高效运行], Xinhua, December 3, 2015, available at <http://www.xinhuanet.com/mil/2015-12/03/c_128495581_2.htm>.

[32] See Ian Burns McCaslin and Andrew Erickson, "The Impact of Xi-Era Reforms on the Chinese Navy," in Saunders et al., eds., *Chairman Xi Remakes the PLA*, 125–170.

[33] See Phillip C. Saunders and Erik Quam, "Future Force Structure of the Chinese Air Force," in *Right-Sizing the People's Liberation Army*, ed. Roy Kamphausen and Andrew Scobell (Carlisle, PA: Strategic Studies Institute, 2007).

[34] See Phillip C. Saunders, Hearing on "A 'World-Class' Military: Assessing China's Global Military Ambitions," testimony before the U.S.-China Economic and Security Review Commission, June 20, 2019.

[35] For an analysis of possibilities, see David C. Logan, *China's Future SSBN Command and Control Structure*, INSS Strategic Forum No. 299 (Washington, DC: NDU Press, November 2016).

[36] See Phillip C. Saunders and Joel Wuthnow, "Conclusion: Assessing Chinese Military Capabilities," in Saunders et al., eds., *Chairman Xi Remakes the PLA*, 711–728.

[37] Kristen Gunness and Oriana Skylar Mastro, "A Global People's Liberation Army: Possibilities, Challenges, and Opportunities," *Asia Policy* 22 (2016), 131–155.

[38] See Erica Downs, Jeffrey Becker, and Patrick deGategno, *China's Military Support Facility in Djibouti: The Economic and Security Dimensions of China's First Overseas Base* (Arlington, VA: CNA, July 2017). Jeffrey Becker, "What Does China Want in Djibouti?" *National Interest*, December 27, 2017, available at <https://nationalinterest.org/feature/what-does-china-want-djibouti-23827>.

[39] See *The Diversified Employment of China's Armed Forces*.

[40] See Scobell et al., eds., *The People's Liberation Army and Contingency Planning in China*.

[41] See the map available at "Recent Big Moves at Theater Commands: 34 New Personnel Within One Month" [战区近来动作不小 1个月内34人履新], *Sohu.com*, August 21, 2016, available at <http://news.sohu.com/20160821/n465257915.shtml>. Thanks to Joel Wuthnow for this point.

[42] The Libya NEO evacuated about 35,000 PRC citizens, but the PLA Air Force role was relatively limited. See Michael S. Chase, "The PLA and Far Seas Contingencies: Chinese Capabilities for Noncombatant Evacuation Operations," in Scobell et al., eds., *The People's Liberation Army and Contingency Planning in China*, 301–319.

[43] For a discussion of what these future far seas operations might look like, see Joel Wuthnow, Phillip C. Saunders, and Ian Burns McCaslin, "PLA Joint Operations in the Far Seas," paper presented at the Naval War College, May 6–7, 2019.

[44] For an argument that the navy is best equipped to develop and operate the advanced C4ISR necessary for far seas operations, see Zhu Dangming [朱党明] and Tai Daguo [秦大国], "Building a Sea and Space Versatile Battlefield Situation Picture" [海天一体战场通用态势图构建], *Journal of Equipment Academy* [准备学院学报], no. 28 (2017), 46–51.

[45] The discussion of such operations in the 2013 edition of the *Science of Military Strategy* envisions the other services playing only minor roles in supporting naval operations. See chapter 10, section 2, 215–216.

[46] For one article by a Southern TC officer advocating an expanded TC role in far seas operations, see Li Jianwen [李建文], "Making the Leap: From Near Seas to Far Seas" [跨越: 从今海到远海], *Jiefangjun Bao* [解放军报], October 13, 2016, available at <http://www.81.cn/jfjbmap/content/1/2016-10/13/04/2016101304_pdf.pdf>.

[47] For a PLA analysis of U.S. and Russian command arrangements and the argument that theater commands should be based on China's strategic needs, see Li Meili [李美丽] and Liu Xiaoliang [刘孝良], "Explaining Joint Command Mechanisms in Foreign Militaries" [解码外军联合指挥机构], Xinhua, October 10, 2018, available at <http://www.xinhuanet.com/mil/2018-10/09/c_129967764.htm>. The article notes that changing strategic needs could require new organizations, citing the U.S. establishment of U.S. Africa Command as an example.

[48] See Saunders et al., eds., *Chairman Xi Remakes the PLA*.

CHAPTER 5

Chinese Intelligence, Surveillance, and Reconnaissance Operations in the Near Seas

By Shinji Yamaguchi

China's military activities along its maritime periphery have been growing rapidly for a decade. Through the early 2000s, People's Liberation Army (PLA) Navy and Air Force missions were limited to China's immediate coastal areas. Over the past decade, however, the PLA has expanded the frequency and range of its activities into the East China Sea (ECS) and South China Sea (SCS). In 2006, for instance, Japan's Self Defense Force scrambled against Chinese aircraft 22 times; in 2016, it did so 851 times. The PLA Navy (PLAN) is regularly traversing several chokepoints between the ECS and the Western Pacific, including the Miyako Strait between Okinawa and Miyako Island, the Ohsumi Strait (south of Kyushu), the chokepoint between Yonaguni Island and Iriomote Island, the channel between Amami Oshima and Yokoate Island, the Tsugaru Strait between Honshu and Hokkaido, and the Soya Strait north of Hokkaido.[1] In the SCS, China has built and militarized islands from tiny islets or submerged reefs and actively patrols and harasses other countries' vessels within the nine-dash line, which China vaguely claims as part of its "historical rights."

A key goal of these peacetime activities is strengthening China's situational awareness. Intelligence, surveillance, and reconnaissance (ISR) operations

provide accurate, relevant, and timely intelligence on China's potential adversaries and territorial rivals to decisionmakers.[2] ISR operations also play a critical role in enabling Chinese joint operations around China's borders, including in the near seas. As previous studies have shown, China has invested heavily in the development of ISR sensors and platforms.[3] However, much less is known about the evolving integration of ISR capabilities across the services and between the PLA and civilian agencies, both of which have been the subject of recent reforms.

This chapter focuses on two aspects of China's approach to ISR in the near seas. The first aspect is how ISR integration works at the theater level. China is tackling the biggest military reform since the establishment of the People's Republic in 1949, aiming to create a military that can conduct joint operations.[4] Although one of the most interesting factors in the reform in terms of ISR is the establishment of the Strategic Support Force (SSF), some remarkable research into that organization has been done already.[5] A remaining question is how ISR activities work in theater joint operations. Before the reforms, each PLA service conducted its own ISR activities, and information-sharing was not vigorous. In conducting joint operations, integration of information is indispensable, but not an easy task; it requires a transformation of organizations, systems, and methods. The second aspect is how and to what extent the PLA coordinates ISR activities with other maritime security forces. A key characteristic of contemporary conflict is the use of nonmilitary measures short of a war, often called "gray zone" coercion.[6] In maritime conflicts and territorial disputes, China deploys not only PLA but also maritime law enforcement agencies and the People's Armed Forces Maritime Militia.[7] The coordination among PLA and other actors seems to be improving, but more analysis is needed to understand the scope of China's progress in this area.[8]

This chapter focuses on two case studies to illustrate China's approach to and development of ISR integration: the ECS and the SCS. The ECS case mainly shows the development of the integration of ISR at the theater level. The PLA has set up an East China Sea Air Defense Identification Zone (ADIZ) and is now focusing on expanding its activities beyond the ECS. In contrast, the SCS case illustrates the development of the coordination on ISR between the PLA, the coast guard, and the Maritime Militia. In the SCS, the focus of China's efforts has been on strengthening effective control over islands and

reefs by creating facilities, setting up administrative control, harassing the fishermen or coast guards of other countries, and militarizing the islands.[9] To be sure, this chapter does not argue that ISR coordination between the PLA and the coast guard is a lesser goal in the ECS or that the integration of ISR in the Southern Theater Command (TC), responsible for the SCS, is not developing. Rather, the ECS case illustrates ISR integration at the theater level more vividly than the SCS case. Similarly, the SCS case shows the development of the coordination between the PLA, the coast guard, and the Maritime Militia more clearly than does the ECS case.

This chapter relies on military textbooks, especially *The Command of Theater Joint Operations* [*zhanqu lianhe zuozhan zhihui*, 战区联合作战指挥] written by Liu Wei, a professor in the Department of Information Operation and Command Training of the National Defense University (NDU), and his team, published by the National Defense University Press in 2016.[10] Liu has written books on topics such as joint operations and informationized warfare that have been supported by the Operations Department of the General Staff Department. The book proudly mentioned that it is the first academic study in the military that systematically describes the command of theater joint operations.[11] NDU texts cannot be seen as evidence of what China is doing but can serve as indicators of what the PLA wants to achieve and how it is educating its future leaders. The NDU book can be seen as an authoritative source to assess a discussion about how to conduct joint operations at the theater level. The second source of data is *Jiefangjun Bao* and other official PLA media. Of course, official media do not necessarily present complete or accurate facts; sometimes they are used to communicate messages about what the PLA wants to achieve, but even these sources can offer important hints about its capabilities and intentions. Finally, sources published by the Japanese and U.S. governments include useful overviews of China's maritime ISR activities.

This remainder of this chapter is organized into four sections. The first section reviews the drivers of the development of China's ISR activities and capabilities. The second section explores two aspects of China's maritime ISR operations: theater joint operations and coordination with other maritime organizations. The third section examines insights derived from the ECS and SCS. The fourth section identifies some challenges and unknowns of ISR operations.

Drivers of China's ISR Modernization

China has developed various platforms to enhance its ISR capabilities. The U.S. Defense Intelligence Agency (DIA) has noted that "China invests heavily in the development and proliferation of intelligence, surveillance, and reconnaissance equipment, force structure, and a universal network that processes information across all of its operational domains."[12] There are three basic drivers of Chinese modernization in this area: the changing character of warfare, operational demands for multidomain ISR support, and gray zone operations that require better cooperation between the PLA, coast guard, and Maritime Militia forces.

First is the introduction of the concept of *informationized warfare*. In contemporary warfare, operational capabilities based on information systems are vitally important. Namely, modern militaries require a joint operational system that includes seamless coordination of operational factors and automatic cooperation across operational platforms based on information technologies. Technological improvements to command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems are essential to improving the speed and effectiveness of decision-making for joint operations while providing secure, reliable communications to fixed and mobile command posts.[13]

However, information is more than an enabler of effective joint operations; it is a critical factor in winning future wars.[14] According to the 2013 *Science of Military Strategy*, informatization has fundamentally changed the requirements for winning wars. In past wars, the focus was on breaking the enemy's morale and preserving one's own force. Within the context of informatization, the focus has shifted to depriving the enemy of the ability to fight by controlling and paralyzing its systems.[15] Directly attacking the command and control and information processing and dissemination systems of the enemy has become a key target.[16] This strategy requires adequate ISR to assist in targeting as well as defending one's own ISR systems.

Second, with the expansion in the PLA's geographic areas of activities, longer range ISR activities and capabilities are indispensable. According to Eric Pedersen, China's ground-based radars cannot view activity much farther out than the 12-nautical-mile territorial sea limits and are thus inadequate for

covering a vast near seas area of about 3 million square kilometers.[17] The PLA would also need several hundred radars to cover China's coastline, which is over 7,800 nautical miles long.[18]

Correcting these problems requires not only more ISR platforms but also stronger integration between ISR capabilities operated by the different services. According to Jeffrey Engstrom, the PLA's ISR system consists of six elements: a space reconnaissance intelligence system, including missile early-warning satellites, electronic reconnaissance satellites, and imaging reconnaissance satellites; a near space reconnaissance system; an air reconnaissance intelligence system, including reconnaissance aircraft, unmanned reconnaissance aircraft, and early warning aircraft; a ground reconnaissance intelligence system, including ground radar networks, radio technical reconnaissance networks, an anti–air observation post network, and antisubmarine sonar reconnaissance networks; a maritime reconnaissance intelligence system, including antisea radar reconnaissance networks and antisubmarine sonar reconnaissance networks; and an information operations reconnaissance system, including electronic reconnaissance, network reconnaissance, and psychological reconnaissance.[19] Under a "system of systems" approach, coordination in each of these domains is required to improve situational awareness, targeting, and other ISR functions.

Third, China's activist posture for enforcing territorial claims requires extensive coordination between the PLA and other Chinese state maritime services in order to achieve maximum effectiveness in gray zone operations. Given the limitations on the PLA's ISR capabilities, cooperating with civilian ISR assets is a useful way to ensure coverage of large maritime areas. This benefit has been recognized at a high level: While visiting Hainan Island, President Xi Jinping met with the maritime militia of Tanmen Township and ordered that militia to actively collect information and support the construction of artificial islands atop the reefs that China controls.[20] The Sansha Maritime Militia, established in July 2013, consists of over 215 people, and one of its major missions is collecting information, as Xi demanded.[21]

Recent Organizational Innovations

Recent organizational reforms illustrate the importance that Chinese planners place on strengthening informatization and improving the range of ISR

coverage into the near seas and beyond. First, the PLA has increasingly focused on improving joint C4ISR. This complements the broader emphasis on theater-level joint operations. Second is military-civil coordination. Because the PLA does not have enough ISR capacity to cover all of its maritime territorial claims, it has increasingly pursued integration with ISR capabilities from other organizations, such as the China Coast Guard and the Maritime Militia. This section reviews both developments.

Integration of ISR Support for Theater-Level Joint Operations

Because the PLA defines the essence of contemporary warfare as *information warfare*, information support for joint operations is critically important. On one level, technological developments improve the integration of the joint C4ISR system. As the DIA's 2019 report on China's military power points out, new technologies enable information-sharing on robust, redundant communication networks to improve commanders' situational awareness. Particularly, "[T]he transmission of intelligence, surveillance, and reconnaissance (ISR) data in near real-time to commanders in the field could facilitate the commanders' decisionmaking processes and make operations more efficient."[22] The 2019 U.S. Defense Department report on the PLA notes that "China is fielding the Integrated Command Platform to units at multiple levels across the force to enable lateral and cross-service communications required for joint operations."[23] Foreign researchers point out that China's theater-level integrated C4ISR system (called the *Qudian* system) uses fiber-optic cables, high-frequency and very-high-frequency (VHF) communications, and microwave systems.[24] China has also developed a joint operational datalink system called the Triservice Tactical Information Distributed Network.[25]

However, technological solutions alone cannot ensure successful ISR support for joint operations at the theater level; organizational solutions are also required. In this sense, the old military region (MR) system had two major problems. First, before the military reform, ISR systems were built along service-specific lines.[26] The stovepipe structure impeded smooth coordination and fusion of information between units from the different services. Second, it was difficult to support operations beyond the MR boundaries.[27] How does the TC system reduce these problems? Because of source limitations, it is difficult to know how the new mechanisms work. However, PLA sources

such as *The Command of Theater Joint Operations* make it possible to understand the direction and goals of the reforms.

The Command of Theater Joint Operations assumes that six centers will be set up under the overarching umbrella of the Theater Joint Operations Command Center (TJOCC) to manage information. These centers would cover operations, intelligence, communication, mobilization, political work, and logistics and equipment. The intelligence center is the core of the theater information system; it is supposed to command information-related units under the direct control of the TJOCC and all service forces in the theater.[28] Based on the order of the theater commander, the intelligence center's main tasks include organizational management of all information-related work, planning and employment of reconnaissance forces, responsibility for a unified analysis of information coming from various sources and provision of reports to the corresponding level, and reporting to higher echelons of authority. Also, the book argues that "the TJOCC Intelligence Center is responsible for all information and reconnaissance forces in the theater, cooperates with the strategic information and reconnaissance system [implying the Strategic Support Force], and forms a joint operation information and reconnaissance system that integrates ground, sea, air, space, electromagnetic spectrum, and cyber intelligence."[29]

Regarding the internal structure of the TJOCC intelligence center, *The Command of Theater Joint Operations* argues that it will typically be based on four departments, namely intelligence collection, intelligence processing, dissemination management, and technical support.[30] The intelligence collection department is responsible for planning and organizing intelligence collection and instructing information-related units under the direct control of the TJOCC and all services in the theater to collect intelligence. The intelligence processing department is responsible for forming intelligence judgments. The dissemination management department is responsible for sharing and managing intelligence and information security. The technical support department is responsible for technical support, including maintaining databases and communication networks.

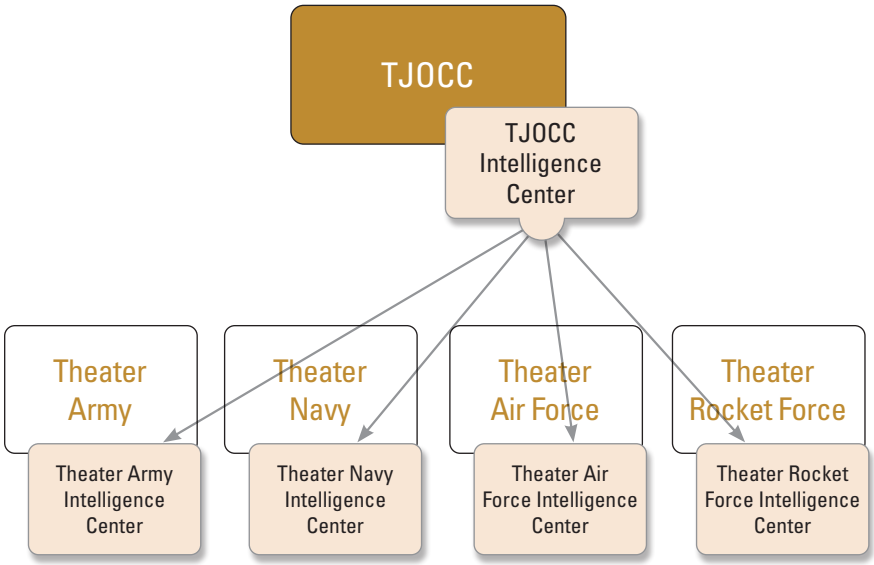
According to the text, intelligence-related forces in the TCs can be classified into three types. First are reconnaissance units under the direct control of the TCs, including field reconnaissance units, technical reconnaissance

units, and special reconnaissance units. Second are reconnaissance units under the command of the services in the theater, including radar brigades, airborne reconnaissance regiments under the theater air force command, reconnaissance ship units, and coastal observation battalions under the theater navy. Intelligence that could affect the entire TC joint operations battle situation will be reported to the TJOCC under the responsibility of the intelligence department of each operational group (that is, air, maritime, and land). Third are nonprofessional reconnaissance forces, including units and other civilian forces that will serve as paramilitary reconnaissance forces. The textbook emphasizes that, because the PLA's professional intelligence-related forces are still weak, China should rely on those paramilitary forces.[31]

Because intelligence requirements differ depending on the nature of the operations, the structure of the theater joint operations information system will have to adapt to those needs. For example, the book argues that, under the unified plan of the TJOCC intelligence center, reconnaissance against enemy airfields should be organized mainly around the theater air operations group, reconnaissance against land targets should be carried out by a land information group, and reconnaissance against a surface action group at sea should be organized mainly around the theater maritime operations group. In most circumstances, maritime reconnaissance missions should be divided based on the strategic direction and sea areas. In coastal areas, a unified information network should be applied. Finally, the air, maritime, and land information groups should set up information centers, which will be responsible for the management of information and coordination with other TC or services in the theater.[32]

How will the information collected by these forces be integrated at the theater level? According to the textbook, the TCs adopt an "information contact point method" [*xinxi guikou fangshi*, 信息归口方式]. Generally, theater-level intelligence is managed through a "contact point based on a chain of command" and a "contact point based on areas," meaning that information obtained through each unit is sent to the command of a service operations group and the information center of each service in the theater (see figure). The information centers of the services process information and make intelligence products, which are then sent to the TJOCC intelligence center. Based on these products, the intelligence center creates and disseminates a comprehensive battlefield situation map. The NDU textbook

Figure. Notional Theater Joint Intelligence Construct



Source: Liu Wei [刘伟], ed., *The Command of Theater Joint Operations* [战区联合作战指挥] (Beijing: National Defense University Press, 2016).

emphasizes the importance of networking between the TJOCC intelligence center and each information center of the services within the theater, and between the service information centers.[33]

However, the description of information collection, processing, analysis, and dissemination contained in *The Command of Theater Joint Operations* seems inconsistent with what is actually happening in each theater under the reforms. There is no doubt that the TJOCC has an information integration function. However, it is not clear that TJOCC intelligence centers have actually been established; instead, the textbook might reflect theoretical discussions about possible future directions in the command and control of ISR capabilities. To date, the author has not found any evidence that such TJOCC intelligence centers exist.

Rather, PLA media reports reveal that information support teams are playing a broad role within the TCs. For example, Yin Lu, the principal engineer and the chief of the Information Support Team and former chief of the Software Management Office of the Beijing MR Command Automation Work Station, plays a leading role in information management of the

Central TC. Under Yin's guidance, a team analyzes information, evaluates threats, and forms a battlefield situation map that integrates information flows from various sources.[34] Yin created a system for comprehensive battlefield information support for decisionmaking [*zhanchang zonghe xinxi fuzhu juece xitong*, 战场综合信息辅助决策系统] in the Central TC. The support team first constructed a basic platform, then fused data systems of the army, navy, air force, and so on.[35]

This example suggests that, at least for now, technical support teams are playiing an important role that may one day be filled by a TJOCC intelligence center.

Stronger Military-Civilian Coordination

A second key organizational development is greater coordination between military and civilian forces. In border and coastal defense, China emphasizes cooperation between the Chinese Communist Party, government, military, police, and civilians [*dang-zheng-jun-jing-min xietiao*, 党政军警民协调] or "five (acting) as one" [*wuwei yiti*, 五位一体], sometimes referred to with the neologism "quinity." ISR is an important area of cooperation between these entities, because without information-sharing, it is difficult to coordinate any other kinds of activities. The NDU textbook emphasizes that "the theater joint operation is a comprehensive operation based on military-police-civilian linkages and unification of ground, sea, air, space, electromagnetic spectrum, and cyber realms."[36] In this view, the main form of contemporary conflict is a comprehensive approach that blurs the distinction between war and peace. In practice, China has employed gray zone coercion in the ECS and SCS conflicts by relying on various actors, including the navy, air force, coast guard, Maritime Militia, and commercial fishing fleets.

The State Committee of Border and Coastal Defense [*guojia bianhaifang weiyuanhui*, 国家边海防委员会] endorses cooperation among the five entities. In February 2017, Chang Wanquan, then defense minister and chief of the State Committee on Border and Coastal Defense, emphasized the role of quinity cooperation in border defense.[37] At a Politburo meeting on April 23, 2018, party leaders adopted a resolution on "strengthening border defense by party-government-military-police-civilian cooperation."[38] The meeting attendees agreed that border and coastal defense featuring cooperation by the quinity is a

distinctive strong point for China and resolved that cooperation between those entities has a "profound meaning" for realizing China's border and coastal defense strategy in the "new era." *Jiefangjun Bao* averred that the meeting showed the importance that President Xi Jinping attaches to border and coastal defense.[39] In December 2018, Wei Fenghe, defense minister and chief of the State Committee of Border and Coastal Defense, emphasized the need for deepening cooperation among the five groups and the importance of military-civil fusion [*jun-min ronghe*, 军民融合] in the border and coastal defense.[40]

Information-sharing between military and civilian agencies is particularly important in providing ISR coverage for the near seas. From the perspective of informatization, the China Coast Guard and the Maritime Militia are supposed to use various systems to communicate with each other and with the PLA. Those systems include the automatic identification system and the Beidou Navigation Satellite System.[41] Also, they are likely to use VHF radio and cellular systems. For the China Coast Guard and the Maritime Militia, reconnaissance and surveillance missions to support the PLAN, especially rigorous patrol activities, are particularly important.[42]

A recent shift in operational authority will likely improve ISR coordination between the navy and the coast guard. In April 2017, the PLAN and the State Oceanic Administration (SOA) reached an agreement on a "Framework for Coordination of Military-Civil Integration" that built on and upgraded a 2009 agreement on the same subject by the two organizations.[43] In March 2018, the China Coast Guard became a part of the People's Armed Police, which was in turn placed under the direct control of the Central Military Commission (CMC). This decision overturned the previous dual-command system in which management of the coast guard fell to both SOA and CMC. Chinese analysts argued that this decision was necessary to streamline the chain of command and more effectively integrate the sea services.[44]

Case Studies

This section examines the development of ISR integration in near seas operations through two cases: the ECS and the SCS. The former case illustrates the integration of ISR between different PLA services at the theater level. In contrast, the latter case illustrates the coordination of ISR operations between the PLA, the coast guard, and the Maritime Militia.

The East China Sea

PLA activities in the ECS and around the Senkakus have become more routine over the past decade. Especially after the establishment of the ECS ADIZ in 2013, the activities of PLA aircraft have significantly increased.[45] To operationalize its ADIZ, the PLA has sought to survey and identify the activities of other countries' aircraft. Some observers are skeptical that China's radars can cover all of the areas within its self-proclaimed ADIZ. In 2015, during a Diet interpolation session, Japan's defense minister Nakatani Gen claimed that there was a blind spot in China's radar coverage of its ADIZ.[46] Additionally, even if China's radars can cover the entire ADIZ, coordination problems might occur between the different types of radar China employs. Mark Stokes, for example, has written that the management of the ECS ADIZ is carried out by units from the PLA Air Force (PLAAF) and the PLAN, posing questions about the extent to which these two services can create a time-sensitive common operating picture.[47] On the other hand, Stokes notes that, after 2006, the PLAAF had taken over responsibility for a new automated joint air defense system that integrates a network of sensors belonging to both the PLAAF and the PLAN.[48] Other reports suggest that China's airborne early warning and control aircraft could increase the PLA's monitoring capabilities and allow them to cover all the areas of the ECS ADIZ.[49]

PLA reconnaissance activities between the ECS and the Western Pacific have been increasing rapidly. For example, the PLAN has sailed its *Dongdiao*-class electronic surveillance ship around the Japanese islands repeatedly in recent years, and in 2015, a *Dongdiao*-class vessel sailed around the Senkakus for the first time. Then, in 2016, a *Dongdiao*-class ship entered Japanese territorial waters around Kuchinoerabu Island and Yaku Island near Kyushu, the first time since 2004 that a PLAN vessel intruded into Japanese territorial waters, with the vessel then proceeding into the contiguous waters around the Senkakus.[50] One Japanese expert believes the purpose of these activities is to detect and collect electronic transmissions, communications, and missile sensor data from Japan Self Defense Force exercises.[51]

Moreover, among the growing PLAN and PLAAF traffic traveling through the channels leading to the Western Pacific, the percentage of reconnaissance ships and aircraft has been growing. For example, a *Dongdiao*-class ship sailed past Honshu Island and entered Japan's territorial waters when it passed

through Ohsumi Strait at the south of Kyushu Island in 2016. In 2017, another *Dongdiao*-class ship sailed through Tsugaru Strait between Hokkaido and Honshu and entered Japan's territorial waters. In addition, reconnaissance variants of Y-8 and Y-9 aircraft have occasionally passed through the Miyako Strait.[52]

ISR integration within the PLA's joint command structure has been developing to support these operations. In 2014, China reportedly established an ECS Joint Operations Command Center [*donghai lianhe zuozhan zhihui zhongxin*, 东海联合作战指挥中心] that was supposed to integrate information from the PLAAF and the PLAN.[53] The relationship between the ECS Joint Operations Command Center and the Eastern TC remains unclear, but the former was likely incorporated into the latter's Joint Operations Command Center as part of the 2015–2016 reforms to the theater structure. Under the new command structure, the Eastern TC has operational control over activities within the ECS, in addition to the Taiwan Strait.

In the Eastern TC, as in the Central TC, the TJOCC support team also plays an important role in ISR integration. The support team was set up as part of the TC reforms and is in charge of information service and database support.[54] News reports explain that the chief of the team, Dan Yi, has been working hard to integrate information systems.[55] PLA media have also provided some insight into the coordination of information flows. In one 2017 Eastern TC exercise, a red team, through information from reconnaissance units and unmanned aerial vehicles, found two possible enemy command posts. The team could not decide which post was the target, but then an air force unit sent a clearer picture, and an electronic countermeasure unit transmitted unusual electromagnetic signals, thereby enabling the team to identify the proper target.[56] This example illustrates the technology-centered development of ISR integration mentioned earlier.

The South China Sea

In the SCS, the focus of China's efforts has been on strengthening effective control over islands and reefs within the nine-dash line by building facilities, establishing administrative control, harassing the fishermen or coast guards of other countries, and militarizing the islands. To accomplish these goals, coordinated military and civilian patrol and surveillance activities have been expanding in recent years. Even before the party decided to emphasize greater cooperation across the

quinity, Hainan Province had already announced plans to establish a coordination mechanism involving PLA units and civilian agencies. By 2016, Hainan institutionalized coordination meetings that would convene twice a year, and by 2018, the province set up a Joint Management and Command Platform.[57]

The pilot case was Sansha City, set up in 2012. According to Xiao Jie, the mayor of Sansha City, Sansha set up a Military-Police-Civilian Joint Border and Coastal Defense Coordination Center [*jun-jing-min lianfang xietiao zhongzin*, 军警民联防协调中心] and initiated the "Six-One Project" and the "Five in One Place Project" in 2015.[58] The "Six-One Project" refers to a plan to establish a joint maritime defense duty room, an information-sharing platform, a maritime law enforcement rotation plan, a joint maritime law enforcement plan, a justice and law enforcement mechanism, and Maritime Militia troops. The "Five in One Place Project" refers to plans to set up a residential committee office, Maritime Militia post, residential cultural center, temporary shelter for typhoons, and wartime command center on the reefs where residential committees exist.

Xiao also explained that Sansha was regularizing patrols and maritime law enforcement activities in the Paracels (where China's territorial claims are contested by Vietnam). On January 6, 2015, Sansha City conducted a military-police-civilian maritime general law enforcement exercise.[59] The exercise included training events such as inspection of foreign ships and search and rescue. Sansha has also set up the General Law Enforcement Bureau, which conducts integrated law enforcement activities. When Chinese Maritime Militia forces find evidence of "illegal" activities by foreign fishery ships, they report it to Sansha Garrison Command, after which the garrison command identifies the locations of the activity and dispatches notices to China's maritime law enforcement ships.[60]

To support these operations, Hainan Province and Sansha City are constructing a surveillance and information network in the SCS. In July 2015, the Hainan Military District built dozens of militia outposts and created a reconnaissance-information network.[61] Moreover, Sansha City set up informationized militia outposts equipped with radar identification and surveillance systems. The information collected is transmitted back to the Military-Police-Civilian Coordination Center.[62] China's artificial island construction has also greatly enhanced the PLA's ISR capabilities as the ground radars installed on the islands extend coverage to a substantial part of the SCS.[63] Combined

with improving coordination with other organizations, China's ISR network coverage has become broader and denser.

Problems and Challenges

While recent organizational changes have permitted better integration of China's ISR forces, several challenges or unknowns remain that could influence the effectiveness of PLA operations. These include problems in education and training, civil-military coordination, and the relationship between TCs and the Strategic Support Force.

Education and Training

The biggest potential obstacle to ISR integration at the theater level is a lack of talent and training. Talent development is recognized as the weakest point in China's joint operations capabilities, leading Xi Jinping to call for a breakthrough in talent development related to joint operations as soon as possible.[64] As a 2013 PLA study argued, joint operations require a commander who has knowledge about both command and technology, a full-time specialist on science and technology, and staff officers and technical staff. However, the study's authors noted that China does not have enough of those people and the overall level of training is low.[65]

China has striven to improve education and training programs for joint operations. In March 2016, Xi Jinping visited NDU and stated that "developing human resources for joint command operations is a core function" of the university.[66] In 2016, the NDU started a specialized course for developing joint operations commanders. Eighty corps- and division-grade officers were selected for the joint operation command training team, while another 120 officers were selected for leadership, management, and command training teams.[67] In 2017, the NDU started a joint post qualification course to enhance education for joint staff. Two hundred battalion- and deputy regiment–grade officers took the 10-month course.[68] Also, the NDU Joint Operations College, established in 2017, will play a critical role in educating officers for joint positions.[69] Substantial progress has also been made in joint training, with some of it devoted to ISR subjects.[70] For instance, since 2018, the army has conducted five types of commandos contests [*qibing*, 奇兵], including intelligence and reconnaissance, special operations, information support, electronic countermeasure, and air offense.[71]

Despite this progress, a key unknown is whether the PLA possesses adequate technical expertise to support joint operations. For example, news reports describe Yin's team in the Central TC as facing difficulties due to great discrepancies between the needs of commanders and the data the technical support team was able to provide. Facing this dilemma, Yin reportedly realized the need for technicians to learn operations. The news emphasizes progress in overcoming difficulties, highlighting how Yin succeeded in providing relevant intelligence to the commander by studying operations.[72] At the same time, the story suggests that the PLA could be facing a continuing shortage of talented people who can connect operations and technology, which may be the reason for the technical support team–centered structure.[73]

Military-Civil Coordination

The second problem concerns ISR coordination between the PLA and civilian actors. Civilian actors do not have enough informationized infrastructure, and their development is unbalanced.[74] The spread of information infrastructure is a foundation of coordination in border and coastal defense, but distributing those assets throughout civilian institutions will take time. Wang Wenqing, the director of the CMC's National Defense Mobilization Department, admitted that the Maritime Militia has to overcome some issues related to databases and radars and needs to better connect its information systems with those of the military and other government departments.[75] Second, each organization has problems related to information-sharing, in particular because the China Coast Guard still has issues sharing information between components that formerly belonged to different maritime law enforcement agencies.[76] Third, there are problems in information security. Informatization and cooperation among the various agencies have been growing, but the PLA cannot readily share sensitive military intelligence with other organizations.[77] Without regulations or frameworks on information security, smooth information-sharing cannot be ensured. In one sign of progress, in February 2020 the CMC revised the PLA Security Regulation, which emphasizes information system security and civil-military integration, though the details are still not clear.[78]

Other Organizational Questions

Several other organizational unknowns could impact the effectiveness of China's future ISR operations. One issue concerns the relationship between the

TCs and the SSF. The establishment of the SSF has significant implications for China's future joint operations because the service is intended to integrate strategic ISR across space, cyber, and the electromagnetic spectrum (for more details, see chapter 6 by John Chen, Joe McReynolds, and Kieran Green in this volume). The 2019 defense white paper mentioned the SSF's mission as including battle environment support, information communication support, information security and defense, and testing new technologies.[79] According to John Costello and Joe McReynolds, the SSF provides strategic information support and strategic information operations. Strategic information support includes centralizing technical intelligence collection and management, providing strategic intelligence support to TCs, enabling PLA power projection, supporting strategic defense in the space and nuclear domains, and enabling joint operations.[80] Costello and McReynolds pointed out that, before the military reform, the Third Department of the General Staff Department had 12 technical reconnaissance bureaus responsible for both cyber espionage and signals intelligence, and the bureaus are likely to move to the SSF.[81] Although Liu's NDU textbook emphasizes that "as for reconnaissance in space, cyber and electromagnetic spectrum, [the TC] should be careful about linking with reconnaissance information outside of the theater, including the Strategic Support Force," the book does not clarify the details of such linking.[82]

There are other unknowns regarding ISR integration. For example, little is known about the relationship between the TJOCCs and the Joint Operation Command Center of the CMC's Joint Staff Department. Liu's theoretical model mentions the relationship between TCs and the Supreme Command [*tongshuaibu*, 统帅部] only notionally, and it does not explain how the two postreform structures will coordinate in practice.[83] Traditionally, the PLA has not delegated much authority to local commands or subordinated units. Agile and flexible ISR support will require autonomy of operations, but interference from officials at the central level could impede the delegation of authority. Similar issues surround the sharing of information between different TCs.

Conclusion

This chapter has examined China's ISR activities and approaches in the near seas. These developments have been driven by the desire for stronger informatization of the force, the expanding area of PLA operations, and China's

prioritization of its maritime territorial disputes in the ECS and the SCS. Two key organizational innovations have contributed to China's ability to reach these objectives. First, as part of the military reforms aimed at improving the PLA's ability to conduct joint operations, the PLA has been striving to integrate its ISR activities and capabilities across the services. Second, China has been strengthening coordination between the PLA and other state-directed paramilitary and civilian organizations. The two case studies found that China's ISR activities in the ECS and the SCS have become more frequent and ambitious. The ECS case study highlighted the expanding role of ISR integration in the new TC construct, while the SCS case illustrated the deepening coordination and information-sharing between the PLA and other organizations.

What are the implications for China's ability to engage in regional conflicts? First, growing ISR integration within the TCs will foster more jointness and result in growing warfighting capabilities in each of China's border and coastal regions. Those capabilities will increase China's ability to counter intervention by foreign forces and will strengthen its ability to coerce its territorial rivals in the gray zone below the level of violent conflict. Second, deepening military-civilian ISR coordination will facilitate smoother operations within the region. Of course, there are many problems and unknowns in China's ISR integration at the theater level, and future developments may not follow a linear trajectory. Still, the recent developments themselves should not be underestimated.

How should other countries respond to China's growing ISR capabilities and activities? First, the United States, Japan, and other like-minded countries should promote international cooperation on maritime ISR to buttress each other's situational awareness. Second, these countries should develop capabilities to better compete in the information domain by disrupting China's ISR systems during a conflict. Attaining adequate offensive capabilities in space, cyber, and the electromagnetic spectrum are key in this regard. Third, other countries should work together to improve their understanding of China's C4ISR system.

The discussion in this chapter raises several questions for further research. First, there is a gap between the theater joint command structure as described in the NDU textbook and those depicted in recent news reports, which suggests that the PLA still does not have an ideal ISR integration

system. What are China's goals in its theater-level ISR integration, and how close is the PLA to realizing its goals? Detailed analysis suggests that the theater-level ISR integration may be, at least for now, a technician-centered system, not a comprehensive system, probably in part due to a lack of people who have information collection, processing, and/or dissemination skills. But this analysis is not definitive, and we should continue to study the development of the theater-level ISR integration.

Second, while the PLA has been expanding its range of ISR operations in the near seas, the impact of the recent military reforms on those activities remains unclear. A lack of authoritative sources is an ever-present problem in PLA studies, but as more information becomes available, it will be important to continually update our understanding of how China's information collection, processing, and dissemination capabilities, activities, and command architectures are evolving.

The views expressed in this paper are the author's views. They do not represent the views of the National Institue of Defense Studies or the Ministry of Defense of Japan.

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CHAPTER 6

The PLA Strategic Support Force: A "Joint" Force for Information Operations

By John Chen, Joe McReynolds, and Kieran Green

Over the past half-decade, China's military leadership has deepened the People's Liberation Army's (PLA's) preparations for fighting "informationized local wars" [*xinxihua jubu zhanzheng*, 信息化局部战争], implementing massive organizational reforms designed to improve the PLA's ability to carry out joint operations both along China's periphery and farther afield. One critical determinant of success in conducting these operations will be the ability of the PLA Strategic Support Force (SSF) to provide effective communications and reconnaissance for PLA units from different services, sometimes deployed far from China's shores. Formed at the end of 2015 in the first round of the PLA's most recent comprehensive reorganization, the SSF's absorption of cyber warfare, electronic warfare, satellite communications and reconnaissance, and psychological operations units highlights the importance of information dominance in the PLA's plans for future combat operations. The newly formed force was charged with securing the information domain while working closely with the other PLA services to execute regional and global military operations.

At its founding, many aspects of the PLA SSF remained a mystery to foreign military analysts. The SSF was almost entirely composed from existing PLA

units, but its stated purpose was to combine, evolve, and employ those capabilities in new ways that would be suited to modern information warfare. This mandate led to the SSF's organizational structure remaining in flux during its first few years. Only limited information was initially released about the SSF's structure and strategic roles, which likely reflected ongoing debates within the PLA as to what type of force the SSF should become. In the more than 4 years since its creation, however, the SSF's organizational structure has solidified, and more information about its personnel, operations, and broad mission set has been made public. The SSF is now increasingly well understood by external observers of the PLA, who relentlessly track the force's subordinate units, leadership appointments, training exercises, and military academic publications through a wide range of publicly available sources.

However, there are still critical areas in which the SSF is not well understood by foreign military analysts. In particular, relatively little is known about its role and organizational linkages to other parts of the PLA for joint warfare, including its ability to work with the services and theater commands (TCs) to successfully conduct its designated missions in the information domain. The manner in which the SSF will carry out these operational missions in concert with civilian agencies and other PLA entities will necessarily depend on both its organizational position within the PLA and the command and control functions the SSF provides through its information support role.

This chapter aims to synthesize the latest information available on the roles of the SSF within the broader PLA, exploring its linkages with other military and civilian entities. The SSF's information support mission cuts across both military and civilian authorities and central and theater commands, and many aspects of the SSF's role in joint operations might still be in a transitional phase, resulting in unclear command and coordination relationships. Nevertheless, enough information is available to tentatively assess how the SSF fits into China's broader military and civilian apparatus. Specific insights can be derived from recent, authoritative texts such as the *Introduction to Cyberspace Operations* and semi-authoritative works by credible PLA experts such as *Research on Cyberspace Superiority in Joint Operations*, which were written after the creation of the SSF.[1] Taken together with other PLA sources, such as academic articles published by SSF personnel and reports in military newspapers, there is now sufficient information

to begin a meaningful discussion of the SSF's role in joint warfare, particularly with respect to information operations.

This chapter explores the role of the SSF in joint warfare using a number of these sources, with a particular focus on information operations such as network and electronic warfare. The first section briefly describes PLA strategy and doctrine regarding the employment of SSF capabilities, including the SSF's role in prosecuting joint operations in coordination with other PLA services and civilian organizations during a conflict. The second section examines the SSF's relationship with civilian actors, describing its interactions with Chinese Communist Party (CCP) leadership organs, other government agencies, and civilian militias. The third section details currently known information about the SSF's relationship with central and regional joint command organizations. The fourth section discusses the SSF's organization as a "joint" force in terms of its integration of personnel from the other services and its role in joint exercises. The chapter concludes with a discussion of the implications of these findings for the SSF's ability to carry out information operations in joint warfare.

The SSF's Role in Joint Information Operations: Theory and Background

China's current approach to information warfare has its roots in the "revolution in military affairs with Chinese characteristics" that the PLA began undertaking in the 1990s.[2] In the wake of the 1990–1991 Gulf War, PLA leaders noted that the U.S. military held an overwhelming edge over its competitors due to its mastery of the information space and ability to use advanced command, control, communications, computers, information, surveillance, and reconnaissance capabilities to coordinate conventional forces. This led the PLA to identify the "information domain," including not only cyberspace but also electronic warfare, psychological warfare, and espionage operations, as representing a distinct battlespace alongside the land, sea, and air domains that would become the linchpin of future military conflict. There is a consensus among PLA theorists that control over the information domain allows a combatant to dictate the pace, direction, and locale of conflict at the strategic, operational, and tactical levels.[3]

One of the PLA's main responses to this new reality has been to embark on a decades-long process of "military informatization" [*junshixinxi hua*, 军事信息化] alongside the broader informatization of China's state and society,

embracing the integration of information technology into nearly every aspect of its peacetime and wartime practices and platforms.[4] This emphasis on information dominance reached a new phase with the creation of the SSF in December 2015. As part of this change, the vast majority of the PLA's network, electronic warfare, and space units have been reorganized into a unified fighting force.

Within the overall information domain, PLA theorists and CCP leaders increasingly believe that cyberspace has become "the nerve center of both national governance and various spheres of society" as the Internet has taken on a paramount role in the nation's political, economic, and social affairs.[5] This echoes President Xi Jinping's recent dictum that "without cyberspace security, there is no national security."[6] In the view of Xi and other Chinese leaders, information dominance is vital not only in a narrow military sense, but also for regime survival. This emphasis on securing party and military interests in cyberspace directly informs the SSF's role in information operations.[7] The SSF is tasked with securing information dominance by carrying out strategic, operational, and tactical cyberspace operations, the collective aim of which is to seize access to information, maintain decisionmaking advantage during joint operations, and ensure national network security.[8]

The SSF's core wartime mission is to seize and exploit the information domain to enable other PLA forces to achieve decision superiority and, therefore, victory. In this endeavor, the SSF aims to more fully operationalize an array of longstanding PLA strategic concepts for the practice of information warfare, including Dai Qingmin's Integrated Network Electronic Warfare [*wangdian yiti zhan*, 网电一体战], which posits the importance of organizationally and operationally linking network and electronic operations rather than treating them as separate efforts, and Ye Zheng's Integrated Information and Firepower Warfare [*xinxi huoli yiti zhan*, 信息火力一体战], which stresses the importance of coordinating information and kinetic strikes to maximize their overall effect.[9] At the same time, the SSF has been entrusted with overseeing information support operations for the broader PLA, including those related to many critical command and control functions.[10]

The SSF's roles demand operations at the strategic, operational, and tactical levels that require command, cooperation, and coordination from other civilian and military actors. For instance, strategic cyberspace operations meant to affect an adversary's politics, economy, science and technology, culture,

and foreign affairs will require approval from the highest levels of the CCP leadership.[11] Operational-level cyberspace activities aimed at seizing control of information during combat, supporting decisionmaking, and commanding cyberspace combat forces to gain control over facilities and information will invariably involve forces directly led by the Central Military Commission (CMC) and the TCs. Finally, tactical cyberspace operations designed to achieve the same effects within a localized battlespace will benefit from coordination between units from various services.[12] These complex joint operations apply to both regional conflict scenarios that have been driving PLA modernization for decades and the increasing number of global deployments that the PLA is likely to undertake in the future.

As the PLA continues to evolve into a joint force capable of executing regional and global missions, the SSF's ability to carry out its corresponding responsibilities will largely depend on its relationships with three different types of actors. The first are civilians such as CCP leadership organs, other government agencies, and civilian militias, all of which share some overlap with SSF missions, forces, or the chain of command. Second, PLA joint commanders at the central and theater levels appear to share responsibility for SSF forces and operations. Finally, the PLA's other services appear to contribute personnel and capabilities directly to the SSF and to conduct joint training with the SSF. The following sections describe each of these three relationships.

Civilians and the SSF: Managing Military and Civilian Information Warfare Forces

While the SSF is a military organization, its mission set is driven by both a civilian CCP leadership that understands information to be a decisive determinant of victory in warfare, and a large civilian science and technology industry that supplies human capital, technology, and capability for information warfare. These relationships are most obvious in network and cyberspace operations, in which the CCP's various governance organs all overlap with the SSF's missions, forces, or chain of command.

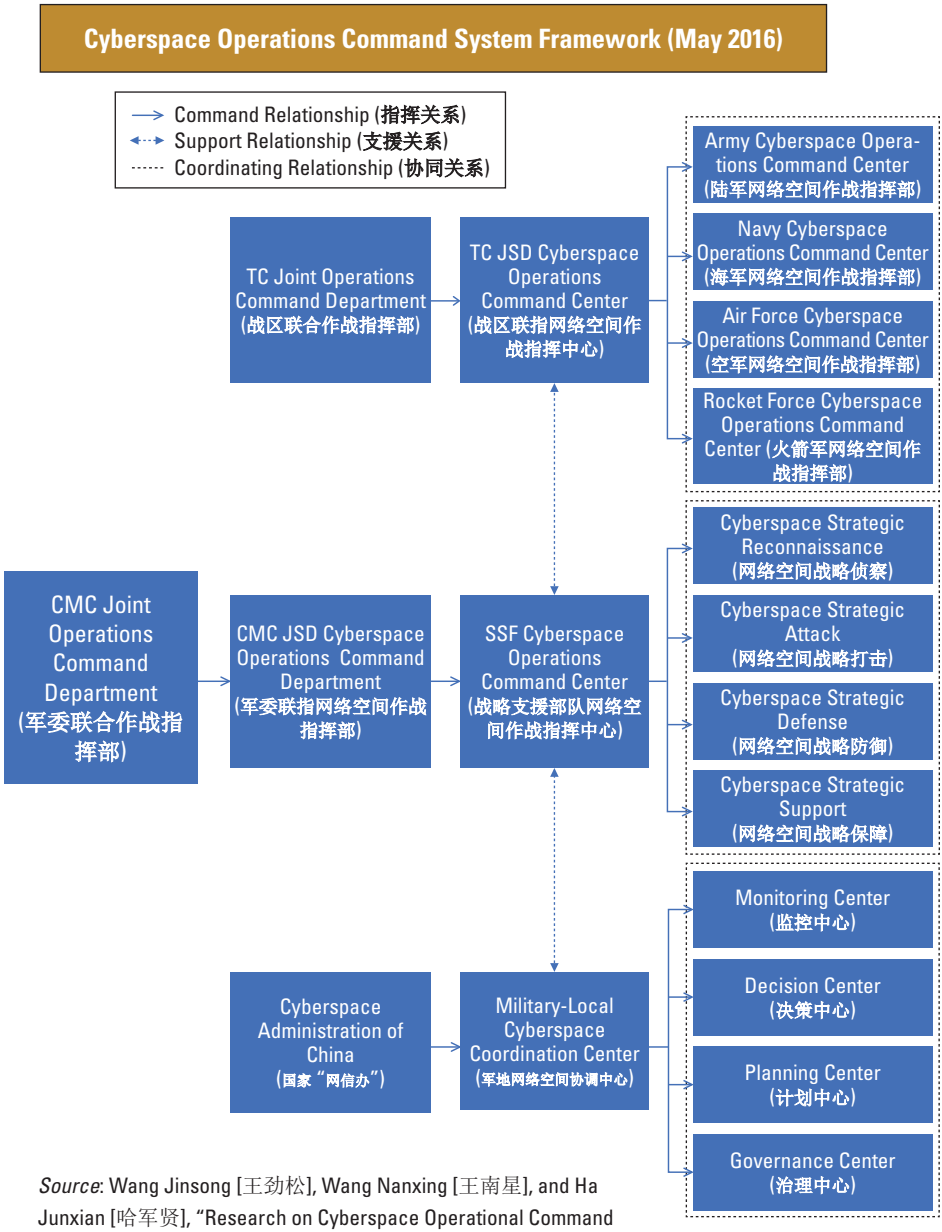
Coordination with Civilian Authorities

Civilian authorities apparently play a prominent role in planning and guidance for military cyber operations in peacetime, but questions remain about

how civil-military relationships will be handled during a conflict. In keeping with the PLA's status as a party-army, overall responsibility for network operations resides with the CCP Central Committee's Cybersecurity and Informatization Commission [*zhongyang wangluo anquan he xinxi weiyuanhui*, 中央网络安全和信息化委员会], sometimes referred to as the Central Cyberspace Affairs Commission (CAC), and the CMC.[13] The *Introduction to Cyberspace Operations*, for instance, notes that peacetime planning and guidance of *cyberspace operations* (a term that the authors use to encompass both network and electronic warfare operations) at the strategic level rest in the hands of such national network security leadership organizations as the Cybersecurity and Informatization Commission, while planning and guidance during wartime are the responsibility of the CMC Joint Operations Command Center (JOCC).[14] This concentration of authority at the highest levels of party and military power is consistent with an overriding party belief that "there is no national security without network security,"[15] as well as the PLA's assessments that cyberspace operations are vital to both joint military operations and overall national security.[16] Beyond this relatively straightforward allocation of responsibilities between civilian and military authorities, however, much remains unknown about the current state of command and coordination relationships for information operations.

In the months immediately following the SSF's formation, SSF officers argued that military and civilian cyberspace forces should support each other during joint operations. A May 2016 research paper by scholars at the SSF Information Engineering University, for example, argued that civilian support to the SSF should be provided through a "military-locality network coordination center" [*jundi wangluo kongjian xietiao zhongxin*, 军地网络空间协调中心] under the control of the office of the Cybersecurity and Informatization Commission (see figure 1). In their account, the SSF would reciprocate this support to civilian organizations through its own "cyberspace operations command center" [*wangluo kongjian zuozhan zhihui zhongxin*, 网络空间作战指挥中心], which would in turn be subordinate to a "cyberspace operations command department" [*junwei lianzhi wangluo kongjian zuozhan zhihuibu*, 军委联指网络空间作战指挥部] under the CMC JOCC.[17] The scholars presented these command departments and command centers as suggestions for the future rather than as depictions of the current organizational

Figure 1. Notional Cyberspace Operations Command System Framework (May 2016)



Source: Wang Jinsong [王劲松], Wang Nanxing [王南星], and Ha Junxian [哈军贤], “Research on Cyberspace Operational Command System” [网络空间作战指挥体系研究], *Journal of Academy of Armored Force Engineering* [装甲兵工程学院学报], no. 5 (2016), 3.

structure—proposed at a time when the SSF's command and control relationships have been described by other PLA officers as in a state of flux.

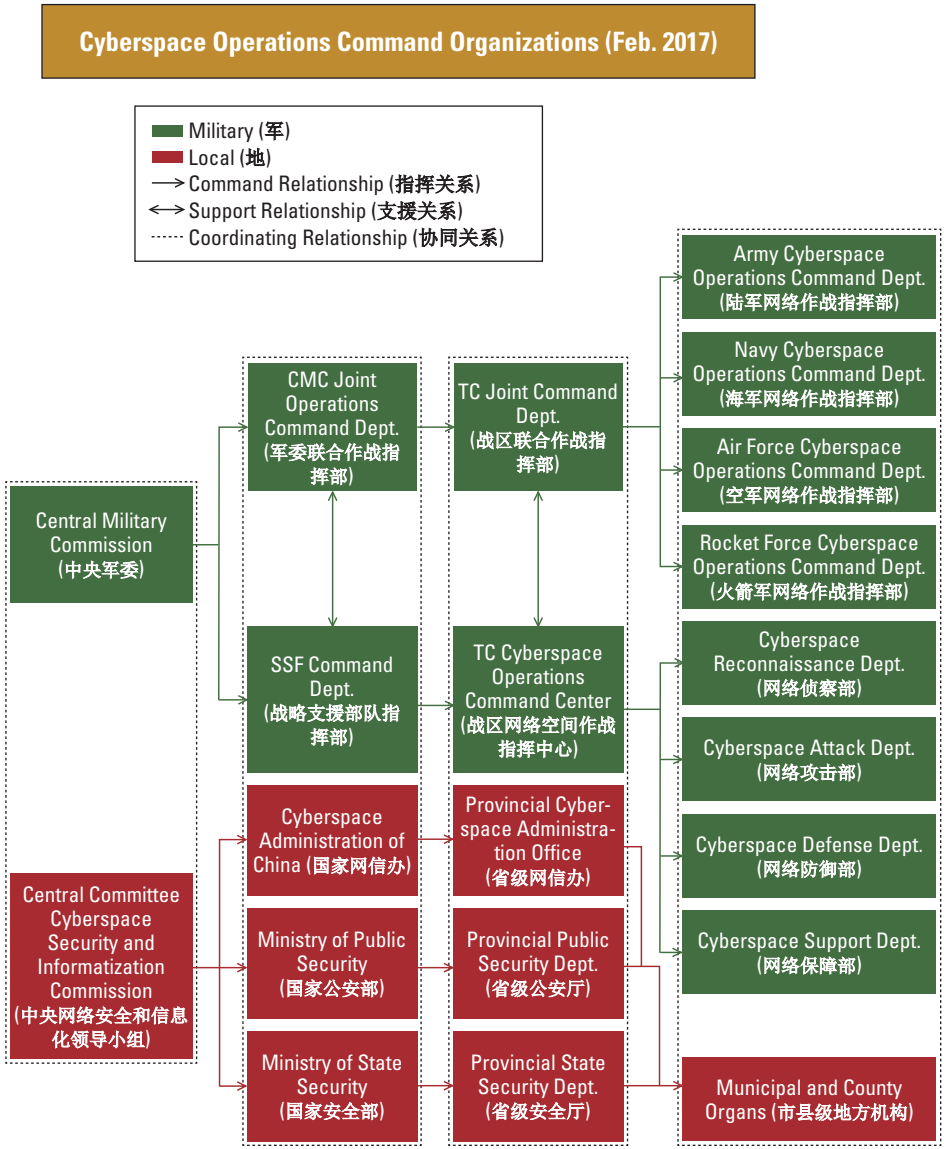
By February 2017, however, writings by some of the same SSF personnel stated that the SSF is responsible only to the CMC and has neither command authority over civilian cyberspace forces nor a supporting relationship with civilian cyberspace organizations. In this telling, the SSF headquarters is responsible only for supporting the joint command element of the CMC while exercising direct command over "TC cyberspace operations command centers" [*zhanqu wangluo kongjian zuozhan zhihui zhongxin*, 战区网络空间作战指挥中心]. The Cybersecurity and Informatization Commission and civilian agencies, such as the national, provincial, and municipal counterparts of the CAC, Ministry of Public Security (MPS), and the Ministry of State Security (MSS), would have "coordinating relationships" with their military counterparts, depicted in figure 2.[18]

The particulars of command and control over information operations forces remained unsettled as late as July 2017. One paper by SSF researchers written that month noted:

> *At present, no military materials at home or abroad mark out strict demarcations in command authorities between military services and branches, and command authority is usually held by the highest commander in a given combat group* [zuozhan qun/dui, 作战群 (队)]*, and the second-in-command is usually the deputy commander of the combat group. During cyberspace support joint operations, concrete command is split by unified agreement between the leaders of the relevant civilian departments or the chief engineers of the battle group.*[19]

Although these PLA writings portray military and civilian command authorities as nominally co-equal managers of China's cyberspace operations, invoking the rhetoric of command by "unified agreement" during cyberspace operations, in practice civilian authority over cyberspace forces appears to end when war begins. Relevant writings repeat the slogan "civilian during peacetime, military during wartime" [*pingshi weimin, zhanshi weijun*, 平时为民, 战时为军] to describe this division of authority, which most likely primarily applies to reserve and militia information operations forces.[20] According to this construct, civilian agencies are mostly responsible for aiding the

Figure 2. Notional Cyberspace Operations Command Organizations (February 2017)



training and equipping of militia forces outside the regular PLA: Local military commanders appear to be reliant on local CAC offices for coordination of resources for training and war preparation. One article by the commander of the Zhejiang Military District in late 2018, for example, stated that, due to the absence of unified network and information leading small groups [*wangxin lingdao xiaozu*, 网信领导小组] within local party committees, local military commanders must strengthen coordination with local CAC offices to obtain resources and form units from local information technology industries that would become the basis for joint military-local command departments [*jundi lianhe zhihuibu*, 军地联合指挥部] during wartime.[21]

Although CAC offices appear to be in charge of coordinating training and equipment, other civilian agencies with information operations capabilities, such as the MPS and MSS, will also have operational roles in a conflict. A wide range of Chinese sources stress that a variety of civilian organizations are actively involved in cyberspace operations, and the notional February 2017 command diagram published by SSF instructors identified several civilian organizations in "coordinating relationships" with the SSF and TCs, including the MSS, MPS, and their provincial- and municipal-/township-level equivalents.[22] The *Introduction to Cyberspace Operations* calls for military cyberspace forces to train with local civilian entities, including local MPS, MSS, and telecommunications providers, arguing that because military information technology infrastructure is often built on civilian technology, the PLA can effectively utilize its considerable resources and familiarity with dual-use equipment.[23] Although many PLA sources acknowledge that the SSF will not be the only force conducting cyberspace operations, the picture remains incomplete as to how the SSF will coordinate with these civilian agencies.

Beyond the Uniform: Civilian Participation in the SSF

In addition to receiving guidance from civilian cyber authorities during peacetime, the SSF is also understood to tap into a variety of civilian forces as "cyberspace operations support forces" [*wangluo kongjian zuozhan zhiyuan liliang*, 网络空间作战支援力量] while preparing for and executing joint cyberspace operations. Chinese military theorists argue that extensive use of civilian expertise is critical to successful cyberspace operations, an understandable position considering that the computer network domain is mostly composed of

civilian infrastructure and operators.[24] The SSF is able to access civilian cyberspace talent through "authorized forces" [*shouquan liliang*, 授权力量] and a variety of reserve cyberspace forces [*yubeiyi wangluo kongjian liliang*, 预备役网络空间力量] such as militia units, both of which are discussed below.

Much like its predecessor organizations within the former General Staff Department, the SSF can augment its operational strength by tapping into civilian assets through the use of authorized forces. The 2013 *Science of Military Strategy* defined *authorized forces* as "military-authorized, organized local forces specializing in network warfare, primarily set up within departments like the MSS, MPS, and others."[25] This wording left it ambiguous as to how, precisely, the PLA would cooperate with the MSS and MPS in cyberspace operations, and for nearly half a decade, no further information was available in open sources as to what this entailed. However, after the creation of the SSF, more recent PLA texts confirm that China's cyberspace capabilities can still be temporarily augmented by incorporating elite network operators from civilian government agencies, private entities, and institutions.[26] These operators would be folded into professional—that is, military—cyberspace forces to jointly participate in cyberspace operations,[27] although it is not clear whether these authorized forces would be incorporated into SSF units piecemeal or if authorized forces would operate as independent units within the PLA's overall joint cyberspace command structure.

When required, special policies or measures can be enacted to incorporate civilian specialists into the SSF, either as directly subordinate to military formations or as authorized forces in support of network reconnaissance, attack, and defense operations.[28] Details on the process for designated civilian specialists as an authorized force are not available in the open source literature, but the *Introduction to Cyberspace Operations* describes their usage as being almost akin to contractors employed for their technical expertise. Authoritative writings emphasize that coordination with authorized forces is critical to mission success, especially in network attack and cyberspace public opinion control operations, where the vast scale and depth of civilian human capital might prove useful in direct support of a broader cyberspace campaign.[29] PLA discussions are almost entirely focused on gaining an advantage over the enemy by fully exploiting civilian technical talent, rather than focusing on potential challenges such

as cost, plausible deniability, or possible legal restrictions governing the use of military force in cyberspace.

Civilians can also join the SSF's cyberspace operations forces through participation in reserve cyberspace forces and militia units. Generally composed of civilian personnel from organizations such as the Ministry of Informatization and Industry Technology, MPS, MSS, large-scale state-owned enterprises, academic institutions, and network security companies, these reserve cyberspace forces undertake war preparation and training tasks during peacetime and are organized into specialized support units/*fendui* [*zhuanye baozhang fendui*, 专业保障分队] during wartime to support network defense operations.[30] Reserve cyberspace forces abide by the "civilian during peacetime, military during wartime" principle that governs China's reserve and militia forces writ large.[31]

SSF reserve units likely comprise personnel with varying government affiliations and degrees of military training. Reserve cyberspace units are reportedly organized by mission set, including units for network attack and defense, psychological defense, electromagnetic spectrum management, and public opinion guidance.[32] More specifically, professors from the SSF Information Engineering University write that cyber militia forces can be organized into three main categories. Information collection forces [*xinxi shouji liliang*, 信息收集力量] are composed mostly of researchers and technical instructors from local research institutes trained in networking technology; public opinion monitoring and guidance forces [*yulun jiankong yindao liliang*, 舆论监控引导力量] prize familiarity with Internet and media culture and deep experience with public opinion monitoring, recruiting most of their personnel from local propaganda and cultural network surveillance departments [*wenhua wangluo jicha bumen*, 文化网络稽查部门] while taking care not to divert too many personnel away from already overworked propaganda departments; and network attack and defense forces [*wangluo gongfang liliang*, 网络攻防力量] prioritize personnel with comparatively greater technical skills, drawing much of their complement from institutes of higher education, research and development organizations, Internet companies, and personnel from telecommunications companies such as China Mobile, China Unicom, and China Telecom.[33]

These militia and reserve units are reportedly under the direct leadership and management of SSF headquarters,[34] although in reality the burden of force construction appears to fall largely on local military commands.

Specifically, military districts and subdistricts are responsible for building reserve and militia cyberspace forces, coordinating these efforts via regularized communication with local CAC offices.[35] Among other possible types of SSF reserve and militia formations, each military district also has its own militia network information *fendui* [*minbing wangluo xinxi fendui*, 民兵网络信息分队] that disseminates reports on military and local network security as well as public opinion trends, analyzes threats to critical military and civilian information systems, and drafts contingency plans for joint force usage.[36]

Training for SSF reservists and militia units appears to be uneven and inconsistent. This might reflect a lingering inability or unwillingness to use cyberspace forces. One November 2018 assessment by the Zhejiang Military District (MD) commander noted that militia network information *fendui* were underutilized during campaign-level exercises, since those commanders that would use these units were themselves unfamiliar with those capabilities or their application.[37] There are also regional variations: The Zhejiang MD commander noted in 2018 that military subdistricts in China's interior still suffer a lack of suitable talent to staff militia forces.[38]

The SSF's Relationship with National and Theater Command Authorities

Although PLA academics have increasingly mapped out the theoretical contours of how the SSF will be trained and employed, relatively little authoritative information has emerged in Chinese open sources on military command and control of information operations forces. While some of this dearth of information can be attributed to the inherent sensitivity of such details, the PLA is apparently still studying exactly how to implement effective command, control, and coordination in the information domain. As late as July 2017, SSF researchers explicitly stated that "at present, no military materials at home or abroad lay out strict demarcations in command authorities between the PLA's services and branches," suggesting that, beyond a general adherence to the orders of the CMC, specific command and control mechanisms remain in flux.[39] Nevertheless, the confirmed existence of regional SSF units and a review of various PLA writings suggest that the SSF likely relies on a regional command architecture centered on JOCCs at the CMC and TC levels.

Broadly speaking, the SSF is responsible for both participating in strategic joint information operations and supporting theater-level joint operations.[40] There is evidence to suggest that the SSF is a unique strategic-level entity that is therefore exempted from having to devote standing forces to supporting TCs and other local military commands, comparable to the PLA Rocket Force's identity as a strategic force whose employment is reserved for the highest levels of military command.[41] Research papers from SSF officers seem to support this understanding: The notional command structures depicted above portray various SSF command elements as being directly subordinate to a CMC "joint operations command department" and either placed in direct command of a TC "network operations command center"[42] or obligated only to support a TC "joint operations" network operations command center.[43] Any support provided to the TCs would likely be based on CMC orders or arranged ad hoc, as discussed in authoritative Chinese literature on information warfare over the past decade.[44]

Recent semi-authoritative PLA sources, however, suggest that the new system contains a bifurcated command structure, with some SSF units reporting to the CMC and others aligned with the five TCs. On one hand, some SSF cyberspace operations forces are likely under the direct command of the CMC through its JOCC, an arrangement that would comport with both the doctrinal emphasis on retaining strategic command over network forces and notional command diagrams put forth by SSF officers. The naming conventions for the subordinate units, such as the SSF Network Security Base [*zhanlüe zhiyuan budui wangluo anquan jidi*, 战略支援部队网络安全基地] and the numbered SSF bases, for example, do not include any references to particular geographic regions,[45] nor do the names of the numbered technical reconnaissance bureaus directly subordinate to the SSF Network Systems Department.

On the other hand, some other SSF units appear to be aligned with the five TCs. At the theoretical level, the 2017 *Introduction to Cyberspace Operations* suggests that TC JOCCS are likely to play a critical role in the command and control of any SSF support to the TCs and lower-level military units, with command authorities for PLA cyberspace operations forces flowing down from the CMC JOCCs to TC JOCCs. The latter organizations then have authority over corps and division-level units during peacetime and specific operational units during wartime.[46] This chain of command, depicted in figure

3, supports the hypothesis that SSF cyberspace forces will be organized into ad hoc information operations groups during wartime.

The authors of *Introduction to Cyberspace Operations* noted that the command structure was slated to change as military reforms continued, stating that "when military reforms are deepened and an integrated peacetime-wartime force is built, the cyberspace operations command system will be adjusted accordingly."[47] Adjustments to the command system are likely to focus on fully removing the service headquarters from the operational chain of command for cyberspace forces and installing more efficient or permanent command mechanisms for providing cyberspace forces to the TCs and below.[48]

Figure 3. Notional Command Authorities for PLA Cyberspace Operations Forces (2017)

The vision for theater-aligned forces contained in that volume might already be coming to fruition. In December 2017, Chinese sources first mentioned regionally aligned SSF Technical Reconnaissance Bases [*jishu zhencha jidi*, 技术侦察基地], or TRBs. The existence of these bases appears to confirm that SSF cyberspace forces provide joint network warfare capabilities to each of the TCs, and the bases themselves are likely the postreform successor organizations to the former military region and service-specific technical reconnaissance bureaus [*jishu zhencha ju*, 技术侦察局].[49] The organizational grades of these new TRBs remain unknown, but their status as successors to the old technical reconnaissance bureaus and possible subordination to the TCs suggest that they would likely be corps deputy leader– or corps leader–grade units.[50]

The regional TRBs retain some of the organizational components of their predecessors but also appear to have incorporated a wider variety of cyberspace capabilities.[51] For instance, both the Western and Southern TRBs apparently feature subordinate divisions [*chu*, 处] and offices [*ke*, 科] under a main team/*dadui* [大队] in a structure that is similar to that of centrally controlled SSF units and analogous (if not identical) to the former technical reconnaissance bureaus.[52] However, the Southern TRB also fields new *dadui* for Battlefield Cyberspace Operations [*zhanchang wangluo zuozhan dadui*, 战场网络作战大队] and Cyberspace Operations [*wangluo zuozhan dadui,* 网络作战大队], each with its own subordinate road-mobile reconnaissance teams [*lu shang jidong zhencha dui,* 陆上机动侦察队].[53] This use of multiple functional *dadui* alongside the existing *chu* and *ke* organizational structure likely extends to all the regionally aligned TRBs, which tend to be symmetrically structured. These *dadui* and subordinate *dui* could potentially be deployed as standing formations to support regional information operations in a joint campaign, instead of being ad hoc combat groups as under the previous system.

The precise command relationships between the regional TRBs and the TCs remain unclear. The former could either be under the CMC JOCC but assigned to support TCs when needed, or be directly under their respective TCs, likely through the TC JOCC. The CMC Joint Staff Department's Network-Electronic Bureau [*wangluo dianzi ju*, 网络电子局], or NEB, and analogous bureaus in each of the TCs are likely candidates for command or coordination of cyberspace forces. As the heirs of Dai's Integrated Network Electronic Warfare concept and organizational successors to the former

Fourth Department of the PLA,[54] Joint Staff Department–NEB personnel appear to be intimately involved in cyberspace doctrine and likely play an operational role. The TCs have Network-Electronic Bureaus within their respective Joint Staff Departments,[55] also referred to as Network-Electronic Countermeasure *dadui* [*wangluo dianzi duikang dadui*, 网络电子对抗大队], positioning these units to coordinate (if not command) cyberspace operations for TC JOCCs in support of joint campaigns.

Although existing sources do not identify the regional TRBs as being directly subordinate to the TCs,[56] their geographic distribution in the same general areas as the TCs suggests an understanding that standing up ad hoc cyberspace operations groups and diverting centrally led SSF units to support the TCs is an inadequate means of executing cyberspace operations in a joint conflict. Nevertheless, the absence of a regional SSF commander dual-hatted as a TC deputy commander suggests that the SSF remains relatively distant from the TCs (by contrast, the commanders of the other TC service components are dual-hatted).

The decision to establish regionally aligned SSF TRBs is a partial repudiation of some of the more radical conceptions of cyberspace operations advanced by some PLA officers, namely the notion that the "formless" [*wu xing*, 无形] domain of cyberspace does not necessarily impose geographic command and control constraints on military units engaged in joint cyberspace warfare. In recent years, some SSF researchers have argued that networked command [*wangluohua zhihui*, 网络化指挥] will reduce or even eliminate the need for commanders to be physically proximate to their subordinate units, thereby reducing the need to physically position these command units within geographic range of a conflict.[57] The establishment of regional bases is not necessarily a full rejection of this idea—regional SSF bases could still take orders from a CMC or TC JOCC located farther afield—but it does suggest that the PLA is not yet ready to fully embrace region-agnostic command of cyberspace forces.

Aside from operational considerations, there are also more prosaic explanations for the continuation of regionally aligned TRBs in the new system. One alternative interpretation is that commanders from the former military regions may have been unwilling to lose high-priority units regarded as "new-type forces" [*xinxing zuozhan liliang*, 新型作战力量][58] to the exclusive control of the CMC, and likely would have fought to retain some type of dedicated technical reconnaissance capability. Another explanation is simple

cost efficiency: Repurposing existing buildings, infrastructure, and personnel from former technical reconnaissance bureaus would have been far less expensive than establishing units from scratch.

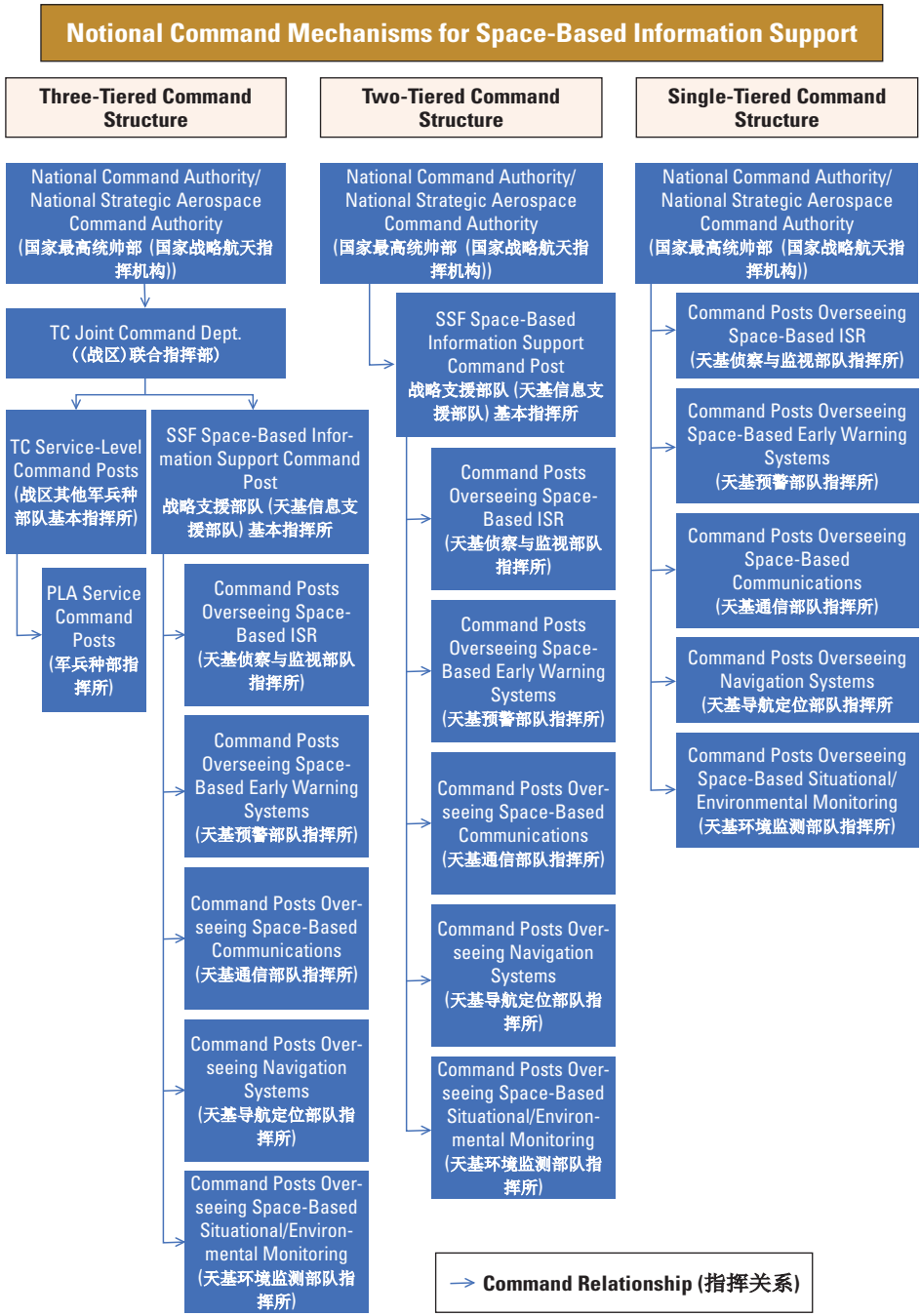
When evaluating the possibility of a hybrid command relationship for some SSF forces, it is important to note that SSF officers writing about potential command relationships for their own forces explicitly treat hybrid command arrangements as within the realm of possibility. PLA researchers have proposed similar hybrid command structures for the SSF's space-based information support forces that would see them reporting simultaneously to both TCs and to the CMC, among possible scenarios in which SSF command posts could report to a TC joint command department or a national command authority, or be left out of the chain of command entirely in order to expedite central command in a fast-moving combat situation. These potential command arrangements are depicted in figure 4.[59]

The findings above provide insight into how the PLA may integrate the SSF into the TCs, but they are nevertheless speculative; authoritative details on command relationships at the central and theater levels remain elusive. At the time of writing, the PLA is apparently still determining the most appropriate command mechanisms for the SSF at both levels.

The SSF as a Joint Force: Integrating Units and Activities with Other PLA Services

Another key relationship that will determine the SSF's effectiveness is with the other PLA services, in terms of both personnel and training. PLA sources frequently characterize the SSF as a truly "joint force" composed of elements taken from the other services and designed to interface with them. China's authoritative 2019 defense white paper stated that the SSF had "actively integrated into the joint operations system" [*jiji rongru lianhe zuozhan tixi*, 积极融入联合作战体系], and other authoritative writings collectively indicate that the SSF's identity as a joint force is built atop the integration of both military units from other services and civilian cyberspace forces into its organization. The PLA's leadership has apparently embraced joint warfare in both rhetoric and action, the latter by transferring units from other PLA services to the SSF and by conducting exercises in which SSF units train with other PLA services.

Figure 4. Notional Command Mechanisms for Space-Based Information Support



The creation of the SSF entailed taking strategic forces and officers from not only the former General Staff Department but also various services and CMC organs.[60] Many of the SSF's units were transferred from the former Third and Fourth Departments of the General Staff, including technical reconnaissance bureaus, electronic countermeasures brigades, and space reconnaissance and control units.[61] Evidence that units from the other services were transferred to the SSF emerged as early as July 2018, with photographs of 95921 Unit political commissar Sun Zhanjun showing his PLA Air Force (PLAAF) blue uniform adorned with an SSF shoulder patch and chest insignia,[62] and a July 2019 news report that showed images of officers from the 91709 Unit wearing white navy uniforms with SSF shoulder insignia.[63] One February 2019 source documenting civilian government expenditures identified several SSF units with 91XXX-series military unit cover designators (MUCDs) previously understood to be navy MUCDs, raising the possibility that these SSF units were formerly part of the PLA Navy.[64] It is clear from these reports that the transfer of units from other services was part of the "active integration into the joint operations system" mentioned in the 2019 white paper. Moreover, the military parade held for the 70th anniversary of the founding of the PRC featured a detachment of SSF troops in army, navy, air force, and Rocket Force uniforms led in part by PLA Navy Rear Admiral Kang Huaihai, as if to underscore this visible jointness.[65]

Chinese sources suggest that some SSF units may have personnel from different PLA services serving together. The SSF's 95921 Unit, formed in February 2018, is a prime example of this trend.[66] That unit was likely created from an existing PLAAF radar brigade and other units from the former Jinan Military Region.[67] Screenshots from a July 2019 news report on the SSF's 91709 Unit show SSF officers who appear to be from the same unit clad in both navy white and army green uniforms.[68] The apparent transfer of units from across China's services into the SSF raises profound questions about the SSF's exact relationship with these formations. What does the assortment of different service uniforms within the SSF suggest, if anything, about its identity as a joint force?

There is a range of possible explanations for this phenomenon. It is possible, for example, that SSF personnel transferred from other services could be wearing their old service uniforms for symbolic reasons. The transfer of units in whole or in part away from their original PLA services to a

new military organization would have been extremely disruptive for unit cohesion and organizational identity, and PLA leaders may have chosen to allow these personnel to continue to wear their previous service uniforms as a recognition of their longstanding service identities while granting the SSF complete functional control over these new units in keeping with the post-reorganization mantra of "the CMC in overall command, TCs managing combat, and services managing force construction."[69] Additionally, authorizing personnel to wear different service uniforms is a visible, low-cost way for SSF leaders to demonstrate to their superiors and to the outside world that their organization is making progress toward becoming a joint force, even if actual progress has been limited.

The different service uniforms worn by SSF personnel may also have a functional explanation. The SSF could indeed be composed of units that have ongoing ties to the other PLA services, an arrangement that could be reflected by the wearing of different service uniforms within the SSF. Units from other services with "strategic support" capabilities could be receiving training and equipment from both the SSF and their home service, or personnel from different services could be loaned to SSF units while still technically assigned to their home service. SSF personnel could also be serving as liaisons to cyberspace units from other PLA services, wearing the service uniform of the host unit but the shoulder patch and chest insignia of the SSF. These types of arrangements might explain the mix of service uniforms worn by SSF officers in the same unit.

Another possibility is that the SSF wields either temporary or permanent operational command over certain army, air force, navy, and Rocket Force units, even as their respective services are responsible for training and equipping those units. There are two reasons why this might be the case. First, the PLA's strong doctrinal emphasis on centralized control over strategic cyberspace operations suggests that the SSF likely retains operational command over certain cyberspace units as a conduit for direct CMC control.[70] Second, the SSF is technically not a *service* [*junzhong*, 军种] but rather a *force* [*budui*, 部队], which may render it exempt from the dictum that services be responsible only for force construction. There is a potential parallel with the Rocket Force, which has apparently not ceded operational control of its units directly to the TCs.[71]

While the exact relationship between the SSF and other services remains unclear, some publicly available information suggests that the PLA is working to integrate the SSF into joint exercises. Most references to the SSF's role in those exercises contain few specifics. For instance, a February 2019 report noted that an SSF unit participated in a long-range Southern TC Navy joint exercise along with PLA Air Force and Rocket Force units, but did not include further information.[72] A more detailed February 2018 report described aspects of an exercise in which a PLA Rocket Force targeting officer selected a tracking satellite to provide targeting data for a launch brigade and subsequently sent data requirements to the relevant SSF unit managing the satellite.[73] An October 2018 article described an exercise in which a Central TC Army brigade paired with an SSF base to carry out training in a complex electromagnetic environment, encompassing reconnaissance and counter-reconnaissance tactics, spoofing, and other forms of electronic countermeasures.[74] While details are sparse, these reports clearly indicate that the SSF has been taking steps to integrate its combat capabilities with other services.

Conclusion

Much of the SSF's ability to effectively carry out its designated missions rests on its relationships with other Chinese civilian and military officials and personnel. However, the SSF's role in joint cyberspace operations is still in transition, characterized by amorphous command mechanisms between both military and civilian authorities and central and regional military commands. Relatively few concrete details about the SSF's relationships with civilian actors, military command authorities, and the other PLA services have emerged in publicly available sources, although initial reports suggest that peacetime authority over the SSF would fall to civilian party leaders and wartime command would run through the CMC or TC JOCCs.

While detailed command and control mechanisms for the SSF are apparently still being hammered out, it is clear that the party leadership intends to hold overall responsibility for cyberspace operations at the highest levels through the Central Cybersecurity and Informatization Commission and the CMC. This arrangement ensures that top leaders will have final authority over the actual employment of the SSF and reduces its autonomy in carrying out cyberspace operations during both peacetime and wartime, but such

bottlenecks may also hinder the ability of the TCs and lower-level units to obtain timely information support during a conflict. This would be especially true if SSF units are assigned to TCs and command relationships are articulated on the fly during a transition from peacetime to wartime.[75]

Beyond its command relationships, the SSF's composition as a joint force also raises more questions than answers. The SSF's wide variety of means for tapping into civilian resources to carry out specific cyberspace operations is consistent with long-term, ongoing efforts to address gaps in the SSF's talent pool. The SSF is vitally important to understanding the PLA's model of future warfighting, but it is far from the only actor carrying out cyberspace operations and will be subject to growing pains as it solidifies its identity as a joint force.

In some ways, the SSF's emerging identity as a joint force allows it to better prosecute its core mission of seizing control over the information domain, especially in cyberspace. In other cases, however, the SSF's emergence as a joint force could paradoxically impede the PLA's overall combat effectiveness. This is especially true when reassigning long-range detection or sensor units away from other services to the SSF. For example, the movement of phased array radar brigade Unit 95921 from the PLAAF to the SSF could add an additional layer of command approval for missile engagement of an aerial target.[76] In the past, a PLAAF radar unit that detected a target would presumably relay that information to PLAAF headquarters, which would then pass it to PLAAF surface-to-air missile batteries for engagement. Today, however, it appears possible that the SSF radar unit would relay target information to the SSF headquarters, which would then likely pass it to a TC JOCC, which would then pass it to a PLAAF surface-to-air missile battery for engagement—a significantly more elaborate sequence of events. The same potential problems could apply to former navy assets such as Unit 91709, a naval radar unit with surface-to-air and surface-to-sea radar stations that was transferred to the SSF as of July 2019.[77] Effective kill chain management in these situations will depend heavily on clear command authorities and functioning communications, neither of which are guaranteed during wartime.

The PLA's acknowledgment of its ability to authorize civilian forces from the MSS and the MPS to participate in joint cyberspace operations suggests that, to a certain extent, the SSF might lack the necessary technical expertise to carry out its strategic objectives.[78] A dearth of talent would not only impede

its actual ability to carry out cyberspace operations but also open the door for organizations such as the MSS to lobby for resources, particularly for computer network attack and reconnaissance missions. While a lack of technical personnel to staff cyberspace militia units in some regions at the military subdistrict level is not necessarily indicative of a systemic inability to attract talent, it does suggest that current efforts are insufficient.

Nevertheless, a successful integration of the SSF as a joint force within the PLA's chain of command could portend a greatly improved ability for the PLA to undertake missions beyond China's borders. At the strategic level, the SSF could become a valuable means for the CMC to directly coordinate joint operations undertaken outside of the TCs' geographic areas of responsibility, funneling interservice network and space-based communications through a single organization directly to the CMC JOCC and reducing potential points of failure within networks that the PLA uses to sustain its overseas logistical infrastructure (on PLA overseas logistics, see chapter 3 by Isaac Kardon in this volume). Predicated on the SSF's sole possession of critical streams of cyber, space-based, or electronic intelligence, this unified command system could significantly streamline the CMC's ability to manage the PLA's joint operations far from China's borders.

A successful incorporation of the SSF into the rest of the PLA's joint operations system would also bolster PLA combat capabilities nearer to China's borders. Within the TCs, a smooth incorporation of SSF units with other PLA forces could enhance the PLA's ability to launch coordinated information attacks in conjunction with kinetic strikes, amplifying the effects of operations undertaken in other domains. Close coordination between the SSF and civilian organizations could help shore up network defense in a conflict with a peer adversary and enable more efficient mobilization of specialized cyber talent in the event of a regime-threatening crisis, either foreign or domestic in origin.

The SSF remains the PLA's premier force for executing information operations and is arguably the single most well-funded and capable Chinese agency for carrying out joint cyberspace operations in peacetime or wartime. Nevertheless, the details of its precise role in joint warfare are likely to remain something of a mystery, even if other clues emerge in the open-source literature. What is certain is that the SSF will continue to be subject to growing pains as it adapts to the challenges of conducting joint operations with civilian agencies and other PLA services.

Notes

[1] *Introduction to Cyberspace Operations* was authored by the PLA National Defense Information Academy [中国人民解放军国防信息学院], an institution integrated into the National University of Defense Technology [国防科技大学] after publication. The volume was evaluated by a committee of high-ranking PLA officers, including Major General Wang Xiaoming [王晓明], director of the Central Military Commission Joint Staff Department's Network Electronic Bureau [中央军委联合参谋部网络电子局]. *Research on Cyberspace Superiority in Joint Operation*s was written by Chen Xiaolong [陈肖龙], a researcher at the PLA National Defense University Information Operations and Command Training Research Department [国防大学信息作战与指挥训练教研部] as of November 2016.

[2] Chen Jie [陈杰], "Jiang Zemin: Construct a 'Thought Reserve' for the Revolution in Military Affairs with Chinese Characteristics" [江泽民: 建造中国特色军事变革的"思想库"], *People's Daily* [人民日报], February 27, 2004, available at <http://www.people.com.cn/GB/guoji/2363240.html>.

[3] See PLA National Defense Information Academy (NDIA) [中国人民解放军国防信息学院], *Introduction to Cyberspace Operations* [网络空间作战概论] (Beijing: PLA Press, 2017), 12–27; Academy of Military Sciences Strategy Research Department [军事科学院战略研究部], eds., *The Science of Military Strategy* [战略学] (Beijing: Military Science Press, 2013), 160; Chen Xiaolong, *Research on Cyberspace Superiority in Joint Operation*s [联合作战网络空间优势研究] (Beijing: National Defense University Press, 2017), 102–106.

[4] See Xiao Tianliang [肖天亮] et al., eds., *The Science of Military Strategy* [战略学] (Beijing: National Defense University Press, 2017), 12, 331–341. See also Joe McReynolds and James Mulvenon, "The Role of Informatization in the People's Liberation Army Under Hu Jintao," in *Assessing the People's Liberation Army in the Hu Jintao Era*, ed. Roy Kamphausen et al. (Carlisle, PA: Strategic Studies Institute, 2014), 207–256.

[5] PLA NDIA, *Introduction to Cyberspace Operations*, 1.

[6] "Xi Jinping Presided Over the First Meeting of the Central Network Security and Informatization Leadership Group" [习近平主持召开中央网络安全和信息化领导小组第一次会议], *People's Daily*, February 27, 2014, available at <http://cpc.people.com.cn/n/2014/0227/c64094-24486402.html>.

[7] In this sense the Chinese definition for *cyberspace* is more all-encompassing than most Western definitions, which assert that cyber operations take place exclusively within the computer network sphere. See PLA NDIA, *Introduction to Cyberspace Operations*, 1–2; and Chen, *Research on Cyberspace Superiority in Joint Operation*s, 1–12.

[8] PLA NDIA, *Introduction to Cyberspace Operations*, 8.

[9] See Academy of Military Sciences Strategy Research Department, eds., The Science of Military Strategy; Chen, Research on Cyberspace Superiority in Joint Operations, 29–31; and Ye Zheng [叶征], "The Location of Information Operations" [信息作战定位], in Lectures on the Science of Information Operations [信息作战学教程], ed. Ye Zheng (Beijing: Military Sciences Press, 2013), 21–41.

[10] For an overview of the SSF's information warfare and information support missions, see John Costello and Joe McReynolds, *China's Strategic Support Force: A Force for a New Era*, China Strategic Perspectives No. 13 (Washington, DC: NDU Press, 2018), 35–44.

[11] See Xiao et al., eds., *The Science of Military Strategy*, 2017, 148; and PLA NDIA, *Introduction to Cyberspace Operations*, 9.

[12] See Chen, *Research on Cyberspace Superiority in Joint Operation*s, 22, 37–38; and PLA NDIA, *Introduction to Cyberspace Operations*, 8–11.

[13] This organization was formerly known as the CCP Central Committee's Cybersecurity and Informatization Leading Small Group [中央网络安全和信息化领导小组] until it was upgraded to a commission [委员会] in the March 2018 reforms of China's state governing apparatus. The office for the Cybersecurity and Informatization Commission is also known as the Cyberspace Administration of China.

[14] PLA NDIA, *Introduction to Cyberspace Operations*, 9, 22. The volume refers to the latter as 国家网络安全领导机构, then specifically references the Cybersecurity and Informatization Commission.

[15] "Xi Jinping Presided Over the First Meeting of the Central Network Security and Informatization Leadership Group."

[16] Chen, *Research on Cyberspace Superiority in Joint Operation*s, 6.

[17] Wang Jinsong [王劲松], Wang Nanxing [王南星], and Ha Junxian [哈军贤], "Research on Cyberspace Operational Command System" [网络空间作战指挥体系研究], *Journal of Academy of Armored Force Engineering* [装甲兵工程学院学报], no. 5 (2016), 3.

[18] Fan Yongtao [樊永涛], Wang Jinsong [王劲松], and Li Shikai [李世楷], "Problems and Solutions to the Cyberspace Operational Command Pattern" [网络空间作战指挥方式面临的问题及对策], Journal of Academy of Armored Force Engineering, no. 5 (2017), 9.

[19] Li Shikai [李世楷], Wang Jinsong [王劲松], and Wang Xiaochao [王小超], "Analysis on Elements of Cyberspace Operational Plans" [网络空间作战计划要素分析], Journal of Academy of Armored Force Engineering [装甲兵工程学院学报], no. 1 (2018), 32.

[20] Zuo Juan [左娟] and Jia Jie [贾杰], "Thoughts on Constructing and Strengthening Network Militias" [加强网络民兵建设的思考], National Defense [国防], no. 3 (2019), 58.

[21] Feng Wenping [冯文平], "Creating a Network Militia for a New Era" [打造新时代民兵网军队伍], National Defense, no. 11 (2018), 40.

[22] Fan, Wang, and Li, "Problems and Solutions to the Cyberspace Operational Command Pattern," 9.

[23] PLA NDIA, *Introduction to Cyberspace Operations*, 301.

[24] See Xiao et al., eds., *The Science of Military Strategy*, 148–149; and McReynolds and Mulvenon, "The Role of Informatization in the People's Liberation Army under Hu Jintao."

[25] The original Chinese text is 授权力量是由军队授权的有组织的专门从事网络战的地方力量，主要在安全部，公安部等相关政府部门内组建. See Academy of Military Sciences Strategy Research Department, eds., The Science of Military Strategy, 196.

[26] Chen, *Research on Cyberspace Superiority in Joint Operation*s, 117, 189–195.

[27] Ibid., 117.

[28] PLA NDIA, *Introduction to Cyberspace Operations*, 110.

[29] Ibid., 126–128, 136.

[30] Ibid., 110. See also Rob Sheldon and Joe McReynolds, "China's Cyber Militia System," in *China and Cybersecurity: Espionage, Strategy, and Politics in the Digital Domain*, ed. Jon Lindsay et al. (Oxford: Oxford University Press, 2015).

[31] Zuo and Jia, "Thoughts on Constructing and Strengthening Network Militias," 58.

[32] Ding Wei [丁飒], "On Optimizing the Functional Structure of Reserve Forces" [试论优化预备役部队功能结构], National Defense, no. 11 (2018), 53. See also Sheldon and McReynolds, "China's Cyber Militia System," 188–214.

[33] Zuo and Jia, "Thoughts on Constructing and Strengthening Network Militias," 58–59.

[34] Ding, "On Optimizing the Functional Structure of Reserve Forces," 53.

[35] Feng, "Creating a Network Militia for a New Era," 40.

[36] Ibid., 42.

[37] Ibid., 40.

[38] Ibid., 41.

[39] Li, Wang, and Wang, "Analysis on Elements of Cyberspace Operational Plans," 32.

[40] PLA NDIA, Introduction to Cyberspace Operations, 11.

[41] Costello and McReynolds, *China's Strategic Support Force*, 3.

[42] Fan, Wang, and Li, "Problems and Solutions to the Cyberspace Operational Command Pattern," 9.

[43] Wang, Wang, and Ha, "Research on Cyberspace Operational Command System," 3.

[44] See Ye, ed., *Lectures on the Science of Information Operations*, 124–131, 134–135.

[45] "Rank of Demobilized Cadres at the Battalion Level and Below for Kunming City, 2018" [昆明市2018年营级及以下职务军队转业干部排名情况], Kunming Human Resources and Social Security Network [昆明市人力资源和社会保障网], October 23, 2018, available at <https://webcache.googleusercontent.com/search?q=cache:G1Kma6TqQFgJ:www.kmsbls.com/zfxxgk/001/XM03110/XM03110/201902/P020190202303973226871.xlsx+&cd=1&hl=zh-CN&ct=clnk&gl=ua&client=firefox-b-1-d>.

[46] PLA NDIA, *Introduction to Cyberspace Operations*, 170.

[47] Ibid.

[48] A commonly articulated driver of command reform is the principle of "CMC in overall command, Theater Commands manage combat, and services manage force construction" [军委管总, 战区主战, 军种主建], which should relieve PLA service headquarters from operational command in favor of force construction. A second driver of command reform is the acknowledgment that the old command system struggled to carry out effective joint command duties among different services, forcing commanders to stand up ad hoc organizations and groups to carry out joint warfare. Both drivers are articulated in Wu Changde [吴昌德], "Actively Adapt to the New System and Effectively Perform New Duties" [积极适应新体制有效履行新职能], *China Military Science* [中国军事科学], no. 1 (2016), 3.

[49] Chengdu Xindu District People's Government [成都市新都区人民政府], "Main Leader, Xindu District" [主要领导 - 新都区], n.d., available at <http://www.xindu.gov.cn/xdqtjj/cont/art_cont.shtml?id=23970&tn=4&menuName=07110227020102>.

[50] Several documents that identify regional technical reconnaissance bases list information about their personnel that suggest that *ke* directors could be Grade 8 special technical officers (equivalent to regiment leader grade; 正团级), and *chu* directors may be Grade 6 special technical officers (division leader grade; 正师级). This suggests TRBs have an organizational grade of at least corps deputy leader and are likely corps leader–grade units. See Chengdu Xindu District People's Government, "Main Leader, Xindu District"; and "Rank of Demobilized Cadres at the Battalion Level and Below for Kunming City, 2018."

[51] According to the 2011 PLA Dictionary, *dadui* are first-level organizations equivalent to battalion or regiment grade. In the PLA Navy, *dadui* are regiment-grade organizations, and in the PLA Air Force, *dadui* are battalion-grade organizations. It is unclear exactly what grade these SSF *dadui* are. See All-Military Terminology Management Committee [全军军事术语管理委员会], *China's People's Liberation Army Military Terminology* [中国人民解放军军语] (Beijing: Military Science Press, 2011), 331.

[52] "Rank of Demobilized Cadres at the Battalion Level and Below for Kunming City, 2018."

[53] Ibid.

[54] Costello and McReynolds, *China's Strategic Support Force*, 25–26.

[55] Fu Malin [符马林] and Wang Hao [王浩], "The 6th China Command and Control Conference and the 4th China Military-Military Integration Technology and Equipment Expo in Beijing" [第六届中国指挥控制大会暨第四届中国 (北京) 军民融合技术装备博览会在京隆重举行], *China Military Online* [中国军网], July 3, 2017, available at <http://www.81.cn/bqtd/2018-07/03/content_8078799.htm>.

[56] Sources specifically identify these bases with regional appellations (for example, SSF Southern Technical Reconnaissance Base, 战略支援部队南部技术侦察基地) rather than Theater Command–specific names, which might be rendered as 战略支援部队南部战区技术侦察基地. See "Rank of Demobilized Cadres at the Battalion Level and Below for Kunming City, 2018."

[57] Fan, Wang, and Li, "Problems and Solutions to the Cyberspace Operational Command Pattern," 9.

[58] *China's Defense in the New Era* [新时代的中国国防], white paper issued by the People's Republic of China State Council Information Office [中华人民共和国国务院新闻办公室], July 23, 2019, available at <http://www.gov.cn/zhengce/2019-07/24/content_5414325.htm>.

[59] Luo Xiaoming [罗小明], Zhu Yanlei [朱延雷], and He Ge [何格], "Space-Based Information Support for Command and Control Systems" [天基信息支援指挥控制体系运行机制及复杂网络建模], *Command, Control, and Simulation* [指挥控制与仿真], no. 5 (2016), 4.

[60] China's Defense in the New Era.

[61] Costello and McReynolds, *China's Strategic Support Force*, 10.

[62] "Bearing in Mind Their Glorious History, the Military and People Build a Dream Together" [铭记光辉历史·军民同心筑梦], Shandong Network [山东网], July 21, 2018, available at <http://www.sdwltv.com/soc/20180721/80281.html>.

[63] "City Leaders Visit Officers and Soldiers Living Under Special Care Conditions" [州领导走访慰问部队官兵和优抚对象], Yanbian Broadcasting and Television Station [延边广播电视台], July 31, 2019, available at <http://www.yb983.com/p/98894.html>.

[64] "Rank of Demobilized Cadres at the Battalion Level and Below for Kunming City, 2018."

[65] "The Strategic Support Force Is Merging and Integrating New Forces" [战略支援部队方队融合跨越, 凝聚新力量], CCTV Military Affairs [CCTV军事], October 2, 2019, available at <http://military.cctv.com/2019/10/02/ARTIMmjUVVbfZ3PA0i2rkecO191002.shtml>.

[66] Shandong Dual Support [山东双拥报], "Provincial Civil Affairs Officers and Dual Support Officers Visit Troops and Armed Police Officers" [省民政厅省双拥办领导走访慰问驻鲁部队和武警官兵], February 6, 2018, available at <http://www.sdsywang.com/sy01/2018-03-22/217.html>.

[67] Forum post by zhandou81, "The Eyes and Ears of Our National Defense—Our Army Radar Units" [国土防卫的耳目—我军雷达部队], xhclub (online forum), February 22, 2019, available at <http://www.xhclub.net/thread-356713-2-1.html>.

[68] "City Leaders Visit Officers and Soldiers Living Under Special Care Conditions."

[69] Wu, "Actively Adapt to the New System and Effectively Perform New Duties," 3.

[70] PLA National Defense Information Academy, *Introduction to Cyberspace Operations*, 20.

[71] David C. Logan, "Making Sense of China's Missile Forces," in Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms, ed. Phillip C. Saunders et al. (Washington, DC: NDU Press, 2019), 411.

[72] Zhou Qiqing [周启青], Zhou Yancheng [周演成], and Liu Jian [刘健], "Southern Theater Command Navy Far Seas Joint Training Realistically Trains Troops" [南部战区海军远海联合训练编队实战化练兵], *China Military Online*, February 19, 2019, available at <http://www.81.cn/hj/2019-02/19/content_9467951.htm>.

[73] Wu Yuhong [吴雨洪], "Rocket Force Trains Troops, Target Data Provided by Strategic Support Force" [火箭军实兵演练 目标参数由战略支援部队提供], *China Youth Daily* [中国青年报], February 24, 2018, available at <http://imil.ifeng.com/56231129/news.shtml>.

[74] Hu Ruizhi [胡瑞智] and Xia Hao [夏昊], "Brigade in the Central Theater Command Army Conducts Confrontation Training with a Strategic Support Force Base" [中部战区陆军某旅与战略支援部队某基地开展对抗演练], *Jiefangjun Bao* [解放军报], October 14, 2018, available at <http://www.81.cn/zq/2018-10/14/content_9509343.htm>.

[75] The authors would like to thank Joel Wuthnow for pointing this out.

[76] Forum post by zhandou81, "The Eyes and Ears of Our National Defense—Our Army Radar Units."

[77] Ai Shang [爱尚], ed., "China's Radar Force Detachments" [中国雷达及观通部队部署], Guantong Detachment [观通分队], June 28, 2015, accessed at <http://av-singen.com/guantong-fendui/79.html>.

[78] See Joe McReynolds and LeighAnn Luce, "The People of Network Warfare," conference paper presented at the Carlisle PLA Conference, Carlisle, PA, October 2018.

Into Action: PLA Operational Concepts and Practice

CHAPTER 7

Reassessing China's Use of Armed Force

By Andrew Scobell

Much ink has been spilled describing and analyzing the use of armed force by the People's Republic of China (PRC) during the past 70 years. Yet the topic remains an enigma with little consensus on why, when, where, how, and to what ends the PRC tends to employ its military might. According to three distinguished experts:

> *There are enduring debates among scholars about whether there are obvious patterns in China's political and military signaling, how defensive or offensive Chinese military strategy has been, whether China is more or less likely to use force as a "normal" tool of diplomacy, and how risk-averse or risk-acceptant Chinese leaders are or have been.*[1]

Some analysts contend that China has become increasingly prone to flex its hard-power military muscles in recent years, using such words as "assertive" and "aggressive" to describe the activities and posture of the People's Liberation Army (PLA).[2] Others observe that this muscle flexing and the accompanying hawkish rhetoric are nothing new.[3] And some insist that a careful analysis of the evidence reveals that China has not actually grown more assertive.[4]

Getting a better handle on the topic is more important than ever since the PRC's military capabilities have never been more potent and its intentions have never been so ambitiously or expansively stated.[5] Even if the probability of China engaging in armed conflict is deemed to be low, were such an event to occur, it would almost certainly have a high impact. While Beijing continues to stress that the main trends of the times are peace and development, there is acknowledgment that countertrends are raising tensions, and the possibility for local wars cannot be ruled out.[6] Future crises involving China and other parties are all but inevitable, and each crisis holds the potential for inadvertent escalation to a conflict. Although PRC officials and formal documents insist that China "loves peace" and seeks to resolve "disputes through negotiation" rather than war, these same officials and documents insist that China's core interests are worth fighting for.[7] It is noteworthy that, in October 2019, the ruling Chinese Communist Party chose to celebrate the 70th anniversary of the PRC's founding with a massive parade in the heart of Beijing showcasing China's burgeoning military power.[8]

This chapter reviews the scholarship on China's use of armed force to draw lessons and insights. The use of armed force is defined here in expansive terms; it does not require actual combat between the armed forces of two states, any loss of life, or a formal declaration of war.[9] For the purpose of analysis, an instance of the use of force involves the employment of overt military or paramilitary power, including the explicit credible threat of military or paramilitary action backed by troop movements, exercises, missile or artillery tests, or the construction or expansion of military installations at or beyond a state's boundaries.[10] This definition is intentionally broader than just PLA activities and encompasses actions by other elements of the PRC's armed forces, including the People's Armed Police (PAP), the coast guard, and the People's Militia. This definition also includes the employment of military and paramilitary forces in noncombat operations in missions addressing nontraditional security threats.

This chapter is divided into three sections. The first section reviews the literature to date on the use of PRC force not just in warfighting but also during crises and peacetime conditions. The second analyzes key dimensions of the use of armed force and identifies trends and constants. The final

section provides concluding thoughts on patterns in China's use of force and its proclivity to keep force employment below the level of full-blown war.

The Literature

The literature on China's use of armed force is heavily qualitative, usually examining one or more case studies, although there are a small number of quantitative analyses. The qualitative studies provide rich detail and invaluable context. More recent scholarship is particularly insightful because these studies have the benefit of primary and secondary sources that were unavailable to earlier generations of scholars. Earlier scholarship based on limited sources stressed the PRC's caution and wariness in decisions regarding the use of armed force.[11] Later studies, which mined more extensive Chinese-language source materials, tended to highlight a greater willingness by PRC leaders to use force and a heightened propensity for risk-taking.[12]

The quantitative scholarship offers a helpful comparative perspective through which to assess China's use of force. This research suggests that the PRC shows little hesitation in deciding to employ armed force. While some research demonstrates that post-1949 China has a greater propensity to use military might than some other states, it is nevertheless no more prone to use armed force than other major powers, including the United States.[13]

The literature on China's use of armed force has generated distinct and separate bodies of research because scholars have tended to delineate clear boundaries for their studies. For example, some studies have focused on wars, while other scholarship has focused on crises.[14] Few scholars have included both wars and crises in the same research project.[15] Similarly, scholars have tended to examine the PRC's use of force either beyond its borders or within its borders, but rarely both.[16] Examinations of domestic employments have focused on a few key episodes, most notably the PLA's role in the Cultural Revolution of the late 1960s and the 1989 Tiananmen crisis.[17] Studies of the external use of force have covered a much wider range of cases.[18] Few studies have examined China's use of paramilitary force—the deployment or employment of non-PLA formations at or beyond the borders of the PRC. However, some pioneering research has been conducted on China's use of the coast guard and Maritime Militia.[19]

It is rare for scholars to examine China's use of armed force across eras: Most analyses have tended to focus on post-1949 China.[20] Nevertheless, studies have considered the PRC's use of military force across a range of PRC leaders.[21]

Dimensions of the PRC's Use of Force

This section examines the dimensions of China's use of force—namely to what ends, why, how, what, and where the PRC has employed armed force over the past 70 years.

To What Ends

The PRC has tended to use force in pursuit of political objectives rather than primarily to achieve operational objectives. This observation is underscored by Beijing's enduring emphasis on the overall strategic situation over the military situation.[22] Since the 1980s, Chinese leaders have repeatedly insisted that peace and development are the main trends of the times. In parroting this mantra, Beijing is emphasizing that it considers a peaceful environment to be in the PRC's best interests. Peace is conducive to the country's top priority: sustained economic development.

The PRC's paramount consideration in the use of force has been whether it advances or protects China's vital national interests. In the early decades of the PRC, these critical interests tended to be defined in territorial terms and focused on perceived threats from the movement of the armed forces of other states in and around China's periphery. Prime examples are the PRC's intervention in the Korean War in late 1950 and China's border war against India in 1962. More recently, China has been far more explicit about articulating its interests and has identified multiple categories of national interests. These include *core interests* and *overseas interests*. The former has received the lion's share of attention because this category is deemed to encompass vital national security interests that China considers worth fighting for. These issues include Taiwan, Tibet, Xinjiang, and Hong Kong.[23] Sovereignty is a critical national interest, and a fundamental and very visible expression of this interest is the presence of a state's uniformed personnel in a claimed territory. This presence could be a minor outpost constructed on a small island in the South China Sea that is claimed as Chinese territory. Other examples include the arrival of a PLA garrison in Hong Kong at the stroke of midnight on July 1, 1997, following the transfer of the territory

from a British colony to a Special Administrative Region of the PRC, and a similar event occurring two and a half years later in the former Portuguese colony of Macau (on December 20, 1999). Meanwhile, overseas interests have emerged as an important new category that Beijing is increasingly concerned about and has demonstrated a readiness to defend with force (see below).

Why

There seem to be three fundamental reasons why China has used armed force in particular instances. The first is to defend PRC vital national interests—namely, to protect sovereignty, safeguard and advance territorial claims, or promote national unification. This rationale is evident in the PRC's sustained efforts in the South and East China seas, which have been redoubled in recent decades, as well as in Beijing's actions vis-à-vis Taiwan. Since at least 2011, the PRC has demonstrated a commitment to employ armed force to protect its burgeoning *overseas interests*—a phrase used with considerable frequency since the mid-2000s.[24]

The second reason is to signal to an adversary a message of deterrence or compellence. Witness the PRC's unrelenting efforts across the decades to coerce Taiwan to accept unification or at least to not pursue independence.[25] Invariably, coercion is cast in pedagogic terms; that is, Beijing's intention is to "teach a lesson" to the other party. This was the clear logic of the 1962 war with India and the 1979 war with Vietnam and has also been a key driver behind other Chinese uses of force, including the 1969 attack on the Soviet Union at Zhenbao Island.[26]

A third reason for the use of armed force is to elevate the country's claim to great power status or to advance its geopolitical influence. This use of force need not be for combat but could be for non-warfighting operations. Prime examples include China's decision to participate in United Nations peacekeeping missions—a small handful of PRC uniformed personnel were first dispatched in 1990—and Beijing's decision to send a PLA Navy counterpiracy flotilla to the Gulf of Aden in December 2008.[27] Significantly, both commitments of Chinese armed force have been sustained across time since the initial deployments. Of course, there may be other reasons for the noncombat use of China's armed forces, including acquiring useful operational experience (see chapter 9 by Joel Wuthnow in this volume).

How

The PRC has used force judiciously, but the actual approach it has used has depended on the level of warfare. Strategically, Beijing has tended to embrace the measured application of force, whereas operationally, the PLA has emphasized a concentration of force to achieve overwhelming superiority at the point of attack.[28] The PRC has routinely been prepared to take calculated risks, but of course the element of uncertainty is always present in warfare. He Kai, professor of international relations at Griffith University, persuasively argues that the PRC has been more accepting of risk when Beijing believes it is in the domain of losses and more risk averse when Beijing perceives it is operating in the domain of gains.[29] Chinese strategic tradition emphasizes the element of surprise—attacking when and where the enemy least expects it. The PLA has embraced this tradition.[30] Moreover, the PLA has continued the Chinese tradition of spectacle and theater in military operations—a Chinese variant of latter-day American "shock and awe"—intended to intimidate and overwhelm one's adversary.[31]

Nevertheless, a discernible trend has been to focus on using fewer and smaller units in limited operations. While the PLA launched massive interventions in Korea (1950) and Vietnam (1979), more recent military operations have tended to be more focused and limited, including the 1988 attack on Vietnamese forces in the Spratly Islands, the 1995–1996 Taiwan Strait crisis, and subsequent activities in both the South and East China seas.

Another clear trend is the willingness of the PRC armed forces to conduct exercises with the armed forces of other states. Since 2002, PLA and PAP units have participated in bilateral and multilateral drills with military and paramilitary formations from a wide range of countries, both on Chinese territory and beyond the PRC's borders. Most of these have been small-scale events ostensibly for noncombat operations, although some have been larger scale actions and resembled conventional warfighting missions.[32]

What

The PRC's use of armed force has encompassed a wide spectrum of actions, especially in recent decades. The range of activities has included not only combat operations but also shows of force by military, paramilitary, and ostensibly civilian actors, especially in maritime operations. Thus, China has

employed the PLA Navy, the coast guard, and the maritime militia, particularly in the South China Sea. To support those operations, China has constructed facilities, fortifications, and bases on islands and reefs around the South China Sea. This support has included, most famously, a concerted effort to construct artificial islands on a massive scale, to include building airstrips and docking facilities. In addition to garrisoning these new facilities, China has increased its presence in the South and East China seas through field exercises, stepped-up patrols, and public declarations and warnings. For example, in 2013, Beijing declared the establishment of an air defense identification zone (ADIZ) across a sizable swath of the East China Sea, including the airspace above the disputed Diaoyu/Senkaku Islands. The declaration was made unilaterally without forewarning or consultation with other countries. Moreover, the new PRC ADIZ overlaps with existing Japanese and South Korean ADIZs.

One of the most provocative employments of the PLA in recent years occurred in disputed territory in the Himalayas in mid-2017: Chinese forces appeared in Doklam to protect crews building a road in this remote region abutting India and Bhutan. Another provocative, but less high-profile, event occurred in May 2018 in Djibouti when lasers operated from within China's base located in the small country were used to blind several U.S. C-130 pilots.[33]

Moreover, these noncombat operational activities have occurred within China as well as in places far removed from the PRC in continental and maritime locations.[34] First, PLA and PAP forces have served in United Nations peacekeeping operations, mainly in Africa and the Middle East. PRC military and paramilitary forces have also engaged in antipiracy operations in the Gulf of Aden since 2008, with three-vessel flotillas being regularly rotated. Other employments of Chinese uniformed personnel have involved the evacuation of Chinese citizens from hot spots around the world. In most instances, these evacuations have been conducted with no appreciable involvement of PLA units. However, in the largest single evacuation to date, some 36,000 PRC civilians were taken out of Libya in 2011. During this operation, PLA Air Force transports were used and a PLA Navy vessel escorted civilian vessels carrying Chinese evacuees across the Mediterranean Sea. Four years later, the PLA Navy took center stage in evacuating several hundred PRC citizens from war-torn Yemen.[35]

Chinese military and paramilitary forces are now stationed at bases in multiple locations beyond China's borders. Officially, the PRC has only one overseas base—in Djibouti. The logistics hub was formally established in 2017 and underscores the growing importance Beijing attaches to the Middle East region and its greater (albeit still modest) military presence in the region.[36] China appears to have also established an overseas base in Central Asia. According to an article in the *Washington Post*, the PLA has been operating a low-profile installation since 2016 in eastern Tajikistan very close to Afghanistan's Wakhan corridor—a narrow panhandle of mountainous terrain that borders China.[37] Other reporting and analysis suggests this is a PAP base.[38] Chinese forces appear to engage in regular patrols near the border with China. Another base is reported to have been established in Cambodia.[39] Rumors of other Chinese bases periodically circulate, with Pakistan being a particularly popular location.

In addition, PLA and PAP troops have participated in field exercises with forces from other countries. These have occurred with a range of different states, sometimes at considerable distance from China. Two of the most regular partners for these exercises have been the member states of the Shanghai Cooperation Organization (SCO) and Pakistan (which joined the SCO in 2017). Since 2002, China has conducted a series of almost annual exercises under the auspices of the SCO.[40] The PLA appears to have conducted more military exercises with the armed forces of Pakistan than it has with the military of any other country. For example, Beijing and Islamabad conducted almost one exercise per year between 2002 and 2014, for a total of 11.[41] One of the most provocative drills to date was the 2019 joint air exercise China conducted with Russia in the East China Sea off the eastern coast of South Korea. The exercise, which was not announced beforehand, resulted in South Korea scrambling fighters and firing hundreds of warning shots at Russian aircraft.[42]

China has also forcefully employed a mix of military and paramilitary assets—most notably the muscular use of the China Coast Guard as well as the maritime militia. The coast guard recently became a component force of the PAP, which in turn has come under the sole command of the Central Military Commission. The coast guard has engaged in a wide range of coercive activities, including ramming other countries' fishing boats. Moreover, in at least

some operations, there seems to have been a high degree of coordination between the PLA Navy, the coast guard, and the maritime militia. A prime example is the 2014 operation to temporarily deploy the oil rig HD-981 120 miles off the coast of Vietnam, in which the rig was protected by concentric circles of fishing boats, white hulls, and gray hulls.[43] Other efforts include China imposing unilateral fishing bans in areas of the South China Sea and enforcing these bans by seizing or expelling other countries' fishing boats.

Where

The geographic location and range of domains where China is employing armed force have been expanding. For decades, Beijing used force mainly around its periphery—at or just beyond the PRC's borders. Of course, military and paramilitary formations have been employed domestically both within the Han heartland and in frontier areas to deal with internal security challenges, but these usages are not the focus of this chapter. As noted above, the PRC has used military force against U.S. and Korean forces on the Korean Peninsula, as well as against India, the Soviet Union, and Vietnam. China has also employed force on multiple occasions in the Taiwan Strait as well as in the South and East China seas.

There has been a gradual but discernible shift in the PRC's use of force from continental to maritime locations. Moreover, China's employment of force has become more of a multidomain activity, encompassing not just land and sea but also air, space, and cyberspace. Although China has been active in space for some time, January 2007 was a turning point when the country conducted its first antisatellite test, launching a medium-range ballistic missile at one of its aging satellites some 600 miles above the Earth and triggering the largest single manmade generation of space debris in history.[44] The event was also notable because Beijing did not announce the test ahead of time and failed to take formal responsibility for weeks afterward.

China has also become active in cyberspace, and units affiliated with the PLA have been identified as the perpetrators of multiple hacks of foreign computer systems (see chapter 12 by Ying-Yu Lin in this volume). These hacks have included the theft of personal, proprietary, and sensitive data. In 2014, the U.S. attorney for the western district of Pennsylvania took the unprecedented step of officially issuing indictments against five serving members of the PLA.[45]

Conclusion

China's use of force is a topic of great importance. The topic has attracted significant scholarly attention over the decades, but this literature has tended to be stovepiped into specific cases or particular categories, such as warfighting or crisis behavior, and limited to the actions of regular military units. These distinctions have tended to inhibit more comprehensive analysis and the identification of overarching trends in China's use of force. This chapter is merely a preliminary attempt toward a broader understanding of how China's employment of armed force, including paramilitary formations and noncombat operations and activities, has evolved over the past 70 years, and further research is needed.

China has articulated and demonstrated a readiness to use force to protect what Beijing views as its vital national interests. Despite Beijing's insistence that it employs armed force as a last resort and then does so only defensively, China has repeatedly used military and paramilitary power in an assertive manner. Over time, the PRC has become more explicit about its national interests and the range of these interests, while the list of issues Beijing believes are worth fighting for appears to be expanding. China has used force to signal its adversaries—both to deter undesired anticipated actions and to compel an adversary to halt unwanted activities. Over the decades, the PRC has shifted from the blunt and basic application of the military instrument to the sharp and sophisticated use of hard power.

The PRC has long worked to limit its use of armed force in terms of both scale and scope, in an effort to minimize the potential for escalation. However, this restraint has not precluded Beijing from repeatedly engaging in provocative actions that have entailed considerable risk of escalation. While these actions have continued, in recent decades the PRC appears to have redoubled its efforts to keep its use of coercive acts below the threshold of war, engaging in what scholars have labeled "gray zone" activities.[46]

The locations of China's use of armed force have noticeably shifted from continental to maritime zones. While force employment remains geographically concentrated at and just beyond the boundaries of the PRC—especially in disputed territories—Beijing is increasingly disposed to use hard power farther afield, including in Central Asia and the Middle East, albeit relatively

softly.[47] Out-of-area operations have focused on noncombat missions to confront nontraditional security threats. Moreover, China is also active in other domains, including outer space and cyberspace, and has demonstrated a readiness to engage in coercive and offensive operations.

While China seems to have few qualms about employing military and paramilitary power in the 21st century, Beijing does seek to avoid actual combat. Hence, it works to use armed force in measured ways without resorting to outright warfighting. This does not mean that the PLA is unprepared or unwilling to engage in combat with another military, nor does it mean that the PLA will not fight if attacked. Indeed, there is no doubt that, in most circumstances, the PRC would never concede "even an inch" of territory without a fight.[48] Nevertheless, the desired goal for the foreseeable future is to engage in nearly bloodless bouts of boxing to advance China's national interests with a minimum of lethal force.

The views expressed are those of the author and do not reflect the views of the nonpartisan, nonprofit RAND Corporation, any of its clients or sponsors, the Marine Corps University, or the United States Marine Corps.

Notes

[1] See Thomas J. Christensen, Alastair Iain Johnston, and Robert S. Ross, "Conclusions and Future Directions," in *New Directions in the Study of China's Foreign Policy*, ed. Alastair Iain Johnston and Robert S. Ross (Stanford: Stanford University Press, 2006), 405.

[2] Characterizations of Chinese actions in locations such as the South and East China seas as "aggressive" and "assertive" have become fairly commonplace. However, Chinese actions in other locations and domains are now also being so described. See, for example, Mitsuru Obe, "NASA Chief Hits at China's 'Aggressive' Space Activity," *Nikkei Asian Review*, September 24, 2019, available at <https://asia.nikkei.com/Editor-s-Picks/Interview/NASA-chief-hits-at-China-s-aggressive-space-activity>. For more analysis, see Andrew Scobell and Scott Harold, "An 'Assertive' China? Insights from Interviews," *Asian Security* 9, no. 2 (2013), 111–131.

[3] On actions, see, for example, Andrew Scobell, "Whither China's 21st-Century Trajectory?" in *The Routledge Handbook of Asian Security Studies*, 2nd edition, ed. Sumit Ganguly, Andrew Scobell, and Joseph Chinyong Liow (New York: Routledge, 2018), 14–15; on rhetoric, see Andrew Scobell, "Is There a Civil-Military Gap in China's Peaceful Rise?" *Parameters* 39, no. 2 (2009), 11.

[4] Alastair Iain Johnston, "How New and Assertive Is China's New Assertiveness?" *International Security* 37, no. 4 (2013), 7–48.

[5] "Full Text: China's National Defense in the New Era," Xinhua, July 24, 2019, available at <http://www.xinhuanet.com/english/2019-07/24/c_138253389.htm>.

[6] Ibid.

[7] Ibid., "Section II: China's Defensive National Defense Policy in the New Era." Moreover, China does not "renounce the use of force."

[8] According to one analyst, "It's a military parade that is political shock and awe." Cited in Robyn Dixon, "The Military Might Showed Off at China's 70th Anniversary Parade Moved Some Chinese to Tears. Here's Why," *Los Angeles Times*, October 1, 2019, available at <https://www.latimes.com/world-nation/story/2019-10-01/china-sends-a-confident-message-on-its-70th-anniversary-parade-is-that-its-advanced-military-rivals-the-u-s>.

[9] Andrew Scobell, *China's Use of Military Force: Beyond the Great Wall and the Long March* (New York: Cambridge University Press, 2003), 10.

[10] This definition is a revised version of the one that appears in Scobell, *China's Use of Military Force*, 9–10. The original version omitted reference to paramilitary forces and included the phrase "in a border area."

[11] These earlier studies include Davis B. Bobrow, "Peking's Military Calculus," *World Politics* 16 (1964), 287–301; Steve Chan, "Chinese Conflict Calculus and Behavior: Assessment from the Perspective of Conflict Management," *World Politics* 30 (1978), 391–410; Melvin Gurtov and Byung-Moo Hwang, *China Under Threat: The Politics of Strategy and Diplomacy* (Baltimore: Johns Hopkins University Press, 1980); Gerald Segal, *Defending China* (New York: Oxford University Press, 1985); Allen S. Whiting, *China Crosses the Yalu: The Decision to Enter the Korean War* (Stanford, CA: Stanford University Press, 1968); Allen S. Whiting, "The Use of Force in Foreign Policy by the People's Republic of China," *The Annals of the American Academy* 402, no. 1 (1972), 55–66; Allen S. Whiting, *The Chinese Calculus of Deterrence: India and Indochina* (Ann Arbor: University of Michigan Press, 1975); and Harlan W. Jencks, "China's 'Punitive' War Against Vietnam: A Military Assessment," *Asian Survey* 19, no. 8 (1979), 801–815.

[12] These later studies include Chen Jian, *China's Road to the Korean War* (New York: Columbia University Press, 1994); Thomas J. Christensen, "Threats, Assurances, and the Last Chance for Peace: The Lessons of Mao's Korean War Telegrams," *International Security* 17, no. 1 (1992), 122–154; Thomas J. Christensen, *Useful Adversaries: Grand Strategy, Domestic Mobilization, and Sino-American Conflict, 1947–1958* (Princeton, NJ: Princeton University Press, 1996); Thomas J. Christensen, "Windows and War: Trend Analysis and China's Use of Force," in *New Directions in the Study of China's Foreign Policy*, ed. Johnston and Ross, 50–85; Mark A. Ryan, David M. Finkelstein, and Michael A. McDevitt, eds., *Chinese Warfighting: The PLA Experience Since 1949* (Armonk, NY: M.E. Sharpe, 2003); Allen S. Whiting, "China's Use of Force, 1950–1996, and Taiwan," *International Security* 26, no. 2 (2001), 103–131; Zhang Shu Guang, *Deterrence and Strategic Culture: Chinese American Confrontations, 1949–1958* (Ithaca, NY: Cornell University Press, 1992); Zhang Shu Guang, *Mao's Military Romanticism: China and the Korean War, 1950–1953* (Lawrence: University Press of Kansas, 1995); John W. Garver, "China's Decision for War with India in 1962," in Johnston and Ross, *New Directions in the Study of China's Foreign Policy,* 86–130; Edward C. O'Dowd, *Chinese Military Strategy in the Third Indochina War: The Last Maoist War* (New York: Routledge, 2007); Zhang Xiaoming, *Deng Xiaoping's Long War: The Military Conflict Between China and Vietnam, 1979–1991* (Chapel Hill: University of North Carolina Press, 2015); and Markus B. Liegl, *China's Use of Military Force in Foreign Affairs: The Dragon Strikes* (New York: Routledge, 2017).

[13] Jonathan Wilkenfeld, Michael Brecher, and Sheila Moser, *Crises in the Twentieth Century, Vol. 2: Handbook of Foreign Policy Crises* (New York: Pergamon, 1988); Alastair Iain Johnston, "China's Militarized Interstate Dispute Behavior, 1949–1992: A First Cut at the Data," *China Quarterly* 153 (1998), 1–30.

[14] John W. Garver, *Face Off: China, the United States, and Taiwan's Democratization* (Seattle: University of Washington Press, 1997); James R. Lilley and Chuck Downs, eds., *Crisis in the Taiwan Strait* (Washington, DC: NDU Press, 1997); Michael D. Swaine, Tuosheng Zhang, and Danielle F.S. Cohen, eds., *Managing Sino-American Crises: Case Studies and Analysis* (Washington, DC: Carnegie Endowment for International Peace, 2006); Andrew Scobell and Larry M. Wortzel, eds., *Chinese National Security Decisionmaking Under Stress* (Carlisle Barracks, PA: Strategic Studies Institute, 2005); Scobell, "Is There a Civil-Military Gap in China's Peaceful Rise?" 4–22; Kai He, *China's Crisis Behavior: Political Survival and Foreign Policy After the Cold War* (New York: Oxford University Press, 2016).

[15] For example, Scobell, *China's Use of Military Force*, includes the PLA's response to the turmoil of the Cultural Revolution in the late 1960s, the Tiananmen crisis of 1989, and the Taiwan Strait crisis of 1995–1996 alongside examinations of the Korean War and the 1979 war with Vietnam.

[16] For two exceptions, see Scobell, *China's Use of Military Force*; and Andrew Scobell et al., eds., *The People's Liberation Army and Contingency Planning in China* (Washington, DC: NDU Press, 2015).

[17] Timothy Brook, *Quelling the People: The Military Suppression of the Beijing Democracy Movement* (New York: Oxford University Press, 1992); Andrew Scobell, "Why the People's Army Fired on the People: The PLA and Tiananmen," *Armed Forces & Society* 18, no. 3 (1992), 193–213. See also Scobell, *China's Use of Military Force*, chapters 5 and 7; and Fang Zhu, *Gun Barrel Politics: Party-Army Relations in Mao's China* (Boulder, CO: Westview Press, 1998), chapters 5 and 6.

[18] See sources cited in footnotes 12 and 13.

[19] On the Maritime Militia, see Conor M. Kennedy and Andrew S. Erickson, *China Maritime Report No. 1: China's Third Sea Force, The People's Armed Forces Maritime Militia: Tethered to the PLA* (Newport, RI: China Maritime Studies Institute, U.S. Naval War College, 2017). On the coast guard, see Lyle J. Morris, "Blunt Defenders of Sovereignty: The Rise of Coast Guards in East and Southeast Asia," *Naval War College Review* 70, no. 2 (2017), 75–112.

[20] For some notable exceptions, see Jonathan Adelman and Chih-Yu Shih, *Symbolic War: The Chinese Use of Force, 1840–1980* (Taipei, Taiwan: Institute for International Relations, 1993); Bruce A. Elleman, *Modern Chinese Warfare, 1795–1989* (New York: Routledge, 2001); and Andrew Scobell, "The Chinese Way of War," in *The Evolution of the Operational Art: From Napoleon to the Present*, ed. John Andreas Olsen and Martin van Creveld (New York: Oxford University Press, 2010), 195–221.

[21] See, for example, Scobell, *China's Use of Military Force*; and Ryan, Finkelstein, and McDevitt, eds., *Chinese Warfighting*.

[22] See Andrew Scobell, "Is There a Chinese Way of War?" *Parameters* 35, no. 1 (2005), 118.

[23] Vice Foreign Minister Le Yucheng, "China Will Continue to Resolutely Safeguard Its National Security and Core Interests," speech to the Xiangshan Forum, Beijing, October 22, 2019, available at <https://www.fmprc.gov.cn/mfa_eng/wjdt_665385/zyjh_665391/t1709818.shtml>.

[24] Jonas Parello-Plesner and Mathieu Duchâtel, *China's Strong Arm: Protecting Citizens and Assets Abroad* (London: International Institute for Strategic Studies, 2015). See also Andrea Ghiselli, *Protecting China's Interests Overseas: Securitization and Foreign Policy* (New York: Oxford University Press, 2021).

[25] See, for example, Robert S. Ross, "The 1995–96 Taiwan Strait Crisis: Coercion, Credibility, and the Use of Force," *International Security* 25, no. 2 (2000), 87–123.

[26] Christensen, "Windows and War."

[27] In the early 1990s, the author asked a PLA general why China had decided to participate in United Nations peacekeeping operations. His answer boiled down to one word: "prestige."

[28] Mark A. Ryan, David M. Finkelstein, and Michael A. McDevitt, "Introduction: Pattern of PLA Warfighting," in Ryan, Finkelstein, and McDevitt, eds., *Chinese Warfighting*, 9.

[29] He, *China's Crisis Behavior*. See also Christensen, "Windows and War," in Johnston and Ross.

[30] Ryan, Finkelstein, and McDevitt, "Introduction: Pattern of PLA Warfighting," 9.

[31] Scobell, "The Chinese Way of War," 212–215. This "shock and awe" can also include the staging of an elaborate military parade such as the one held in Beijing on October 1, 2019. See Dixon, "The Military Might Showed Off at China's 70th Anniversary Parade Moved Some Chinese to Tears."

[32] For some authoritative lists of military exercises China's armed forces have conducted with the armed forces of other states, see the appendices included in PRC defense white papers.

[33] Courtney Kube and Corky Siemaszko, "Pentagon Accuses Chinese of Blinding Djibouti-Based U.S. Pilots with Lasers," NBC News, May 3, 2018, available at <www.nbcnews.com/news/africa/pentagon-accuses-chinese-blinding-djibouti-based-u-s-pilots-lasers-n871096>.

[34] M. Taylor Fravel, "Economic Growth, Regime Insecurity, and Military Strategy: Explaining the Rise of Noncombat Operations in China," *Asian Security* 7, no. 3 (2011), 177–200; Jeffrey Engstrom, "Taking Disaster Seriously: East Asia Military Involvement in International Disaster Relief Operations and Implications for Force Projection," *Asian Security* 9, no. 1 (2013), 38–61.

[35] See, for example, the succinct description and analysis in Andrew Scobell and Nathan Beauchamp-Mustafaga, "The Flag Lags but Follows: The PLA and China's Great Leap Outward," in *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms*, ed. Phillip C. Saunders et al. (Washington, DC: NDU Press, 2019), 189–190.

[36] Ibid., 187–189.

[37] Gerry Shih, "In Central Asia's Forbidding Highlands, A Quiet Newcomer: Chinese Troops," *Washington Post*, February 18, 2019, available at <https://www.washingtonpost.com/world/asia_pacific/in-central-asias-forbidding-highlands-a-quiet-newcomer-chinese-troops/2019/02/18/78d4a8d0-1e62-11e9-a759-2b8541bbbe20_story.html>.

[38] Radio Free Europe/Radio Liberty, "China's Security Interests in Central Asia," *Majlis Podcast*, February 24, 2019, available at <https://www.rferl.org/a/majlis-podcast-china-tajik-base-security-interests-central-asia/29788029.html>.

[39] Jeremy Page, Gordon Lubold, and Rob Taylor, "Deal for Naval Outpost in Cambodia Furthers China's Quest for Military Network," *Wall Street Journal*, July 22, 2019, available at <https://www.wsj.com/articles/secret-deal-for-chinese-naval-outpost-in-cambodia-raises-u-s-fears-of-beijings-ambitions-11563732482>.

[40] See the list of SCO exercises in Andrew Scobell, Ely Ratner, and Michael Beckley, *China's Strategy Toward South and Central Asia: An Empty Fortress* (Santa Monica, CA: RAND, 2016), table 3.2, 38–39.

[41] This judgment is based on a review of the available evidence—namely, totaling the numbers of exercises on authoritative lists including those compiled in PRC defense white papers and RAND reports. For the specific number cited, see Andrew Scobell et al., *At the Dawn of Belt and Road: China in the Developing World* (Santa Monica, CA: RAND, 2018), 142. See also table 6.2, 141.

[42] See, for example, "Northeast Asia's Contested Skies: Scrambling," *The Economist*, July 27, 2019, 19.

[43] Carl Thayer, "China's Oil Rig Gambit: South China Sea Game-Changer?" *The Diplomat*, May 12, 2014, available at <https://thediplomat.com/2014/05/chinas-oil-rig-gambit-south-china-sea-game-changer/>.

[44] Scobell, "Is There a Civil-Military Gap in China's Peaceful Rise?" 17.

[45] Mark Clayton, "U.S. Indicts Five in China's Secret 'Unit 61398' for Cyber-Spying," *Christian Science Monitor*, May 19, 2014, available at <https://www.csmonitor.com/World/Passcode/2014/0519/US-indicts-five-in-China-s-secret-Unit-61398-for-cyber-spying-on-US-firms>.

[46] These activities have proved frustrating and difficult for other countries, including the United States, to deal with. For analysis of the problem with recommendations for how to respond, see Lyle J. Morris et al., *Gaining Competitive Advantage in the Gray Zone*: *Response Options for Coercive Aggression Below the Threshold of Major War* (Santa Monica, CA: RAND, 2019).

[47] Sun Degang, "China's Military Relations with the Middle East," in *The Red Star and the Crescent: China and the Middle East*, ed. James Reardon-Anderson (New York: Oxford University Press, 2018), 83–102.

[48] This was stated by PRC Defense Minister Wei Fenghe in his speech to the Xiangshan Forum in Beijing on October 21, 2019. See "Speech by Gen. Wei Fenghe, State Councilor and Minister of National Defense of People's Republic of China," Beijing Xiangshan Forum Secretariat, October 25, 2018, available at <http://www.xiangshanforum.cn/speakingDetail_EN?code=A-3f41e1A422DD9Ag&sessions=%E7%AC%AC%E5%85%AB%E5%B1%8A%E5%8C%97%E4%BA%AC%E9%A6%99%E5%B1%B1%E8%AE%BA%E5%9D%9B>.

CHAPTER 8

Bomber Strike Packages with Chinese Characteristics

By Nathan Beauchamp-Mustafaga

As China's desire to project power far from its shores grows, the People's Liberation Army (PLA) is developing a suite of capabilities to strike targets throughout Asia and beyond. The PLA Air Force (PLAAF) is doing its part by developing bomber strike packages to prosecute offensive long-range strikes. This effort began by the late 1990s with the development of the H-20 long-range strategic bomber, but real-world training has been most evident in the H-6K bomber flights occurring throughout Asia since 2015. This chapter traces the development of China's bomber strike packages and assesses how these flights support operational training for PLAAF wartime missions.

The PLAAF's development of bomber strike packages in both pilot training and operational research has been steady and methodical. Between the mid-2000s and the mid-2010s, training focused on experimentation and sporadic integration for bomber strike packages domestically, while early operational research was observational and theoretical. Since the introduction of the H-6K in the early 2010s, the PLAAF has now transitioned to real-world training outside China with integrated packages, while operational research has evolved to address more concrete mission-critical challenges. Future developments, including the introduction of unmanned aerial vehicles (UAVs), the H-6N, and

the H-20; expansion of Chinese overseas basing; and the identification of new targets, could move such training in new directions.

This chapter is organized into four sections. The first section provides an overview of the role of bombers in broader PLA campaign planning. The second section argues that domestic flights, mainly overland, between 2009 and 2013 laid the foundation for later flights past the First Island Chain. The third section describes overwater flights since 2015 and frames them as an important step in realizing the PLAAF's dream of becoming a "Strategic Air Force." The fourth section examines the training value of these missions, focusing on their real-world targets. The conclusion considers future developments and current challenges, including limited pilot training and questions about how bombers fit into a "joint" PLA. Of note, PLA Navy (PLAN) Aviation bombers also train for bomber strike packages, but this chapter focuses on only PLAAF operations.[1]

This chapter is based on several Chinese military sources, including PLA doctrinal publications, PLAAF theoretical and operational academic research, Chinese state-run media reports, PLAAF reporting on bomber operations, and previous RAND research.[2] Data on PLAAF bomber overwater flights since 2015 is based on public reporting by the PLA and Chinese media, as well as on Taiwanese, Japanese, and U.S. Government reports on Chinese bomber activity. All data is current as of January 1, 2020.

A Foundation in Theory: Insights from Doctrinal Research

Chinese military doctrine emphasizes the role of airpower in a wide variety of campaigns, including long-range bomber strikes, and has been heavily influenced by U.S. bomber employment in recent wars. Reflecting the operational goals of recent training flights, PLAAF research since 2015 similarly suggests a growing focus on operationalizing bombers for wartime missions.

PLA Observations of U.S. Bomber Operations

The PLA has long paid attention to foreign wars as a way to comprehend the latest combat developments; substitute for its own lack of combat experience since 1979; and better understand potential adversaries, especially the United States.[3] In Kosovo and the two Iraq wars, the PLA witnessed the role of airpower in modern warfare, including standoff strikes involving long-range bombers. The 2006 *Science of Campaigns* noted, "Due to the unprecedented

improvement of the flight range of modern aviation weapons, especially under the assisting- and safeguarding-support of refueling aircraft and space positioning systems, some [weapons] already have 'global reach and global operations' capabilities, and this makes long-range raid a reality."[4]

The PLAAF learned several lessons from recent U.S. operations. First was the global nature of air operations and the implications for a rapid, flexible, and overwhelming response to any regional crisis. Second, PLAAF scholars noted that global strikes limited overseas basing requirements.[5] Third, the PLAAF studied the composition of U.S. strike packages, including the integration of UAVs, which merited a detailed graphic of Gulf War packages in the 2005 PLAAF encyclopedia.[6] Finally, Chinese observers wrote jealously of U.S. joint operations as the gold standard for integrating multiple services for synergistic effects.[7]

Bomber Strike Package Targets and Composition

Based in part on their observations of U.S. combat experience, PLA strategists have long considered how bomber strikes can support the larger mission of achieving "command of the air" [*zhikongquan*, 制空权] and subduing the enemy.[8] According to the 2006 *Science of Campaigns*, bomber strikes are envisioned as the main part of an air raid within a firepower campaign.[9] These operations are intended to achieve air superiority by degrading the enemy's air force and denying its use of airbases to mount (counter)attacks. The 2013 *Science of Military Strategy* similarly described long-distance bomber operations as a main application of military power in modern war due to their efficient lethality.[10]

Operations over water are integral to these assessments. The 2009 *Strategic Air Force* foreshadowed the later bombing flights by arguing,

> *Regional application is a mark of modern strategic Air Force. As far as long-term demands are concerned, the Air Force must fly across the national border, and such systems as "strategic cruising" must be established. But currently we do not possess the conditions. The problem is that relevant countries and relevant domestic departments are "not used" to the Air Force departing the border, and categorically see it as a threat and provocation. The Air Force for a few decades has been strictly observing the edge line of the maritime training area, and has not transgressed the bounds. Setting up this red line was reasonable in the past, but in the future it can*

> *become an imprisonment. We must step over this ridge in order to construct a modern strategic Air Force. . . . Third is to timely and appropriately implement cruising flights in sensitive regions during military struggle, and demonstrate power.*[11]

This point was reiterated in the authoritative 2013 *Science of Military Strategy*, which calls for the PLAAF to conduct "strategic cruising" and "blue water operations."[12]

In Chinese doctrinal publications, bomber strikes serve multiple purposes. One key role is conducting early, perhaps preemptive, strikes on enemy coastal defenses and airbases to clear the way for ground forces in island-landing campaigns. Another is achieving air superiority, which can be accomplished by grounding the adversary's air force through either destruction or paralysis.[13] For a Taiwan contingency, PLAAF and PLAN Aviation are the main forces for "advanced firepower assault" after the initial missile strikes pave the way for an amphibious landing, in cooperation with the PLAN, PLA Army, and PLA Rocket Force.[14] Other bomber operations include preparatory fires in support of an air landing, counterattacks against the adversary, and even counterterrorist campaigns.

Strike targets for these operations can vary depending on the specific campaign and mix of aviation forces employed.[15] Targets include adversary command and control systems; adversary strike capabilities, such as artillery, missile launch positions, airfields, and even ground units; adversary defenses, such as air defenses, radars, and early warning systems; and rear area support, such as logistics, supply, and transportation infrastructure. Although these targets are mostly fixed sites that allow for predesignated targeting, PLAAF modeling articles and training also include mobile targets.[16]

Despite some different terminology, various PLA sources similarly describe a typical bomber strike package. At its core, a complete package includes bombers, fighters, reconnaissance planes, early warning aircraft, electronic warfare aircraft, and aerial refueling tankers. These assets are generally divided into three to seven groups, depending on the level of detail; the highest level includes an air assault team [*kongzhong tuji dui*, 空中突击队], an air-covering team [*kongzhong yanhu dui*, 空中掩护队], and an air support team [*kongzhong baozhang dui*, 空中保障队].[17] The assault team, responsible for the actual strike, includes bombers, fighter-bombers, and attack aircraft.

Fighters compose the covering team, which escorts the assault team by countering enemy aircraft. The air support team contains reconnaissance planes, early warning aircraft, electronic countermeasure aircraft, and tankers.[18]

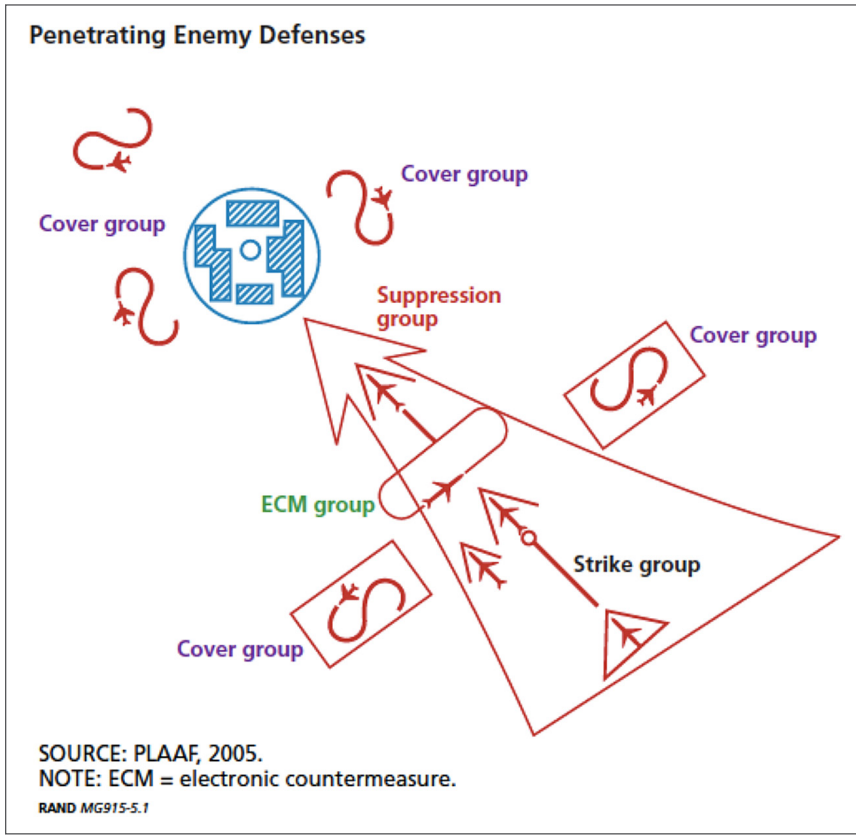
The PLAAF envisions bomber strike packages integrated under a system-of-systems (SOS) operations framework.[19] The *Science of Campaigns* describes the joint air raid as incorporating "the reconnaissance, command, jamming, and destruction into one entity," making the "collective functions of air operations . . . complemented and enhanced," and "form[ing] a complete, organizationally matched, and rational operational integrated whole."[20] Within this package, airborne early warning (AEW) aircraft are considered the most important component due to their command role.[21] One understated aspect of the information loop for strike targeting is covert forces deployed behind enemy lines; it has been emphasized occasionally in training and academic research, in part drawing from U.S. operations in Kosovo.[22]

Bomber operations can be divided into multiple phases with different aircraft and formations executing sub-missions at the same time. According to one analysis, these operations can be separated into five phases: reconnaissance by the support team, suppression of counterair by the escort team and penetration by the assault team, suppression of air defense by the escort team and maneuver by the assault team, interdiction by the escort team and actual strike by the assault team, and aerial support and battle damage assessment by the support team.[23] Figure 1 illustrates the movement of a strike group toward its target.

Recent PLAAF Research

Over the past 15 years, Chinese technical research on bomber strike packages has increasingly shifted toward operations. Research in 2007 detailing how China should construct a modified package for fighter-bombers indicated that earlier studies were geared toward operations in the distant future, based on the numbers of some aircraft vastly exceeding the numbers China had at that time—18 tankers—and by employing aircraft China did not possess—namely unmanned combat aerial vehicles (UCAVs).[24] This research was increasingly operationalized under an SOS framework, clearly transitioning from theory in 2007 to more detail in 2016 to modeling actual data flows in 2017–2018.

Figure 1. Chinese Bomber Strike Package



Source: Roger Cliff et al., *Shaking the Heavens and Splitting the Earth* (Santa Monica, CA: RAND Corporation, 2011).

PLA academic research reveals several insights about how the PLAAF is thinking about future bomber strike operations. Several distinct lines of effort at the Air Force Engineering University illustrate major trends in recent research. First, a focus on the number of aircraft required to support strikes on enemy bases, airfields, or, surprisingly, aircraft carriers suggests research on theater-wide bomber strikes and not just a single package, as the modeling includes upward of 120 sorties for bombers, 30 for tankers, and 30 for AEW aircraft—all near or above the numbers of aircraft understood to be in the PLAAF currently.[25] Second is an effort to operationalize the tactical command and control aspect of package integration, mapping the data flows between

the 22 components of a package minute by minute for a notional strike.[26] A third focus is designing an SOS operations approach to what is likely a campaign-level plan, utilizing bombers to strike adversary bases and carriers.[27] Fourth, there appears to be intermittent research supporting the H-20's development, including data on balancing the cost tradeoffs of stealth technology and optimizing the next-generation strike package based on cost.[28] Fifth is new research into the role of UAV/UCAV swarms supporting bomber strike packages, a slight update to the longstanding inclusion of UAVs into Chinese packages.[29] Taken together, these lines of research show the PLAAF's considerable interest in advancing bomber strike operations, and it is likely to pay dividends in the coming years.

A Foundation in Practice: Bomber Training, 1996–2013

The development of doctrine coincided with a training regimen that focuses increasingly on overwater bomber missions. PLAAF training for bomber strike packages was intermittent and mostly piecemeal in the 2000s before picking up in the 2010s. Early efforts focused on experimental integration of components, and the earliest known instance of a full package flying together occurred only in 2009. The full package training that did occur may well have been culminating exercises to test the PLAAF's progress on bomber strike packages, and unsurprisingly, it focused on Taiwan scenarios; however, there is limited evidence to suggest this package was a regular component of training in these years.

Early Operations and Training

Even before the PLAAF entered its modern era in the 1990s, it had already executed some version of bomber strike packages, including over water. Bomber packages—or at least fighters escorting bombers for strikes—were used in the Korean War against the United States and in the Yijiangshan Island campaign against the nationalists. Xiaoming Zhang recounts that PLAAF Tu-2 bombers were escorted by La-11 fighters, both machines Soviet built, at least once during the Korean War in November 1951 and again at least once against the nationalists in January 1955.[30] Detailing one air raid during the Yijiangshan campaign in January 1955, which involved an overwater component, Zhang notes that "PLAAF Tu-2s and Il-10s escorted by

La-11s twice dropped bombs over Yijiangshan Island, while another group of aircraft (9 Tu-2s, 12 Il-10s, and 12 La-11s) pounded nationalist headquarters and heavy artillery positions."[31] This is not to say that PLAAF offensive bombing played a large role in early PLA operations—Zhang recounts three instances across the Korean War, the 1958 Taiwan Strait crisis, and the Vietnam War in which the Chinese leadership decided against offensive bombing for various reasons.[32] It is unclear how much the PLAAF kept up this training over the intervening decades.

Since at least the mid-1990s, the PLAAF has been employing mixed aircraft formations to protect bombers during strikes. This approach is evident in coverage of PLA exercises in 1996, presumably during the Taiwan Strait crisis in the early part of that year. A 1996 *China Air Force* article describes the role of fighter planes to cover bombers in an island-landing exercise:

> *On the coast of southern Fujian, a landing operation exercise had just started, multiple aircraft including fighters, attack planes, and bombers of the Air Force were dispatched together to coordinate with the operations of the Army and the Navy. . . . In the meantime, bomber planes set out under the cover of fighter planes. The covering fighter planes, headed by Deputy Regimental Commander Liao Huansheng, went straight for the "enemy" front to take the "enemy" by surprise. Bomber planes flew above the "enemy" front at the exact time as planned, heavy bombs dropped one after another. Instantly, the "enemy" front was leveled. Fighter, attack, and bomber planes fought a beautiful combined air battle.*[33]

The article also reflects the PLA's struggle to integrate different types of aircraft, noting, "In the past, joint operations were not truly joint operations where cover airplanes and attack airplanes flew far apart from each other and did not have much to do with each other." This exercise, however, brought the fighters and attack aircraft together in a mixed formation.[34]

Another 1996 exercise similarly featured a "strategic" bomber that conducted "in-depth strikes on the enemy," reflecting the evolution of the PLA's early recognition of modern war moving toward precision bombing.[35] The bomber was "threatened by . . . advanced radar networks, ground-to-air missile systems, and air defense firepower," making the "bombers have no second chance, meaning that they must strike and hit first!" This bomber unit

had already trained for "very difficult bombing raids" such as "formation at night, at low altitude over the sea, and silently and 'blindly' with their advanced automated navigation systems," as well as large-scale bomber formations and strikes on maritime targets.[36]

In the 2000s, the PLAAF experimented with incorporating multiple aircraft types in SOS operations and conducting long-range bomber operations, both of which are key requirements for developing bomber strike packages. In December 2003, it established a "test training base" that was "the beginning of the exploration of base-centric, intensive, and large-scale system-of-systems operation forces building."[37] In September 2004, the PLAAF carried out initial nighttime maritime training flights. Roger Cliff relays the following:

> *It is worth noting that, in recent years, the PLAAF has begun to emphasize night formation flying at low altitude over the ocean. This indicates the willingness to accept the likelihood of significantly increased operational training losses in order to begin building an experience base among PLAAF fighter and attack aircraft crews that will support the sort of low-level strike package operations described in this monograph. This is another indication that the PLA is serious about implementing the capabilities and concepts described in its publications.*[38]

Exercises during the 2000s focused on supporting and extending the range of Chinese bomber operations. In the China-Russia Peace Mission–2005 exercise, conducted in Shandong Province, PLAAF fighters and bombers took a "new leap" for "mid- to long-range precision attack," utilizing aerial refueling for the fighters.[39] In August 2006, a "new approach to the campaign-level system-of-system confrontation exercises" included an "air attack exercise with . . . multiple . . . aircraft types."[40] In August 2008, an exercise included a "certain Air Force bomber aviation regiment [which] flew a long distance for thousands of kilometers [and] destroyed multiple target groups at sea," representing a "historic leap" for transitioning from "bombing from adjacent airspaces to long-range precision attack."[41] Extending this overland training outside the country, once again in cooperation with Russia, Peace Mission–2010 featured bombers and fighters crossing the border into Kazakhstan for ground attacks, supported by tanker and AEW aircraft that stayed within Chinese airspace.[42]

A Historic "First": Overwater Training in 2009

The PLAAF's first bomber strike package appears to have flown over water in a June 2009 exercise hosted by the Guangzhou Military Region. The exercise included "bombers, fighter planes, refueling tankers, reconnaissance planes, and early warning planes," and the "many formations of air attack, air protection, air early warning, and air refueling formed a long distance sea and air attack combat system."[43] It was described as a "large-scale long-distance sea and air attack joint attack exercise" that included "more than a hundred fighter planes" and set multiple records: "most air combat power in a long-distance sea voyage," "longest distance flown over the sea" for fighters, and "longest continuous flying time" by a new Chinese-produced fighter.[44] Pilots trained for "blue water combat patrol, system of systems confrontation . . . system of systems attack and defense combat," among other skills.[45] The exercise was based on a Taiwan scenario, because reports mention "long distance maneuver of the ground troops crossing over the sea."[46] Most of the media coverage emphasized fighters but also noted that PLAAF members trained for "reconnaissance . . . cover and escort," and they flew in an "air attack formation."[47] *PLA Daily* later detailed the core components:

> *For the first time ever, the people's air force broke through the "blue territory over the yellow land," and a fighter group, a refueling aircraft group and a bomber group under the Guangzhou Military Region Air Force flew out with thunderous force, creating the longest flying distance record during distant sea exercises of our air force aviation units.*[48]

This apparently represented the first time all these systems flew together in a bomber strike package, and it is notable that it occurred over water for regional power projection in a Taiwan scenario at a record distance from China's coastline.

The exercise was framed in terms of SOS operations. *Kongjun Bao* said it demonstrated "a new-style weapons and equipment system of systems . . . [which] has been gradually formed with all types of fighter planes, bombers, attackers, airborne early warning aircraft, airborne refueling planes, reconnaissance aircraft, and electronic warfare aircraft, with third-generation fighter planes as the backbone."[49] The exercise was touted as part of transforming the "combat capability generation mode" and "a new breakthrough in the realization

of the Chinese military's blue water airborne operational capability." The exercise also included "space-based satellite, air combat aircraft, and command early warning, and command communication, etc., as well as ground missiles, anti-aircraft artillery, radar, electronic jamming," among others, though it is unclear whether all were incorporated into the larger strike operation.[50]

The Mission Action–2013C Exercise

Several years elapsed until another exercise brought the components of a bomber strike package together again in overwater training. Held in October 2013, Mission Action–2013C was a "system-of-systems joint air operation" and "multi-aircraft type aerial offense and defense joint operations campaign exercise" that included bombers, fighters, early warning aircraft, reconnaissance aircraft, electronic jamming aircraft, and tankers.[51] It was likewise based on a Taiwan scenario, with bomber strikes against both ground and maritime targets.[52] In contrast to the 2009 exercise, this exercise was explicitly described as working toward the common purpose of strikes on enemy targets; it also involved cooperation with the PLAN, as the aircraft used "information provided by an aerial target guidance group on naval vessels." Reflecting the value of overland training as preparation for overwater training, a dry run for the strike package integration was apparently held in mid-July over the Gobi Desert for all components except the bombers.[53]

The Mission Action–2013C ground attack featured all the components of the strike package. *Kongjun Bao* notes that "a formation of bombers which took off from the hinterland of the central plain arrived in their designated airspace and quickly rendezvoused with a formation of red force fighters which had refueled en route. With the fighters covering, the bombers raced straight for their designated target a long distance away. . . . [The] airborne early warning aircraft and the red force aircraft group executed their long-range raid over the sea."[54] This attack was not a surprise, however, since "the blue force had apparently long since grasped the red force's combat intent and had various defensive countermeasures in full swing." This attack included "warplanes on patrol and awaiting battle, going out to intercept . . . [and] air defense sites [that] evaded red force aerial and space reconnaissance." When the strike package approached the enemy position, the early warning aircraft notified the formation that "the blue force's combat aircraft were taking off

and might implement interception against us," so the "cover formation quickly advanced forward" and "covered the reconnaissance aircraft's continued close-up reconnaissance." The "warplanes . . . [were] alternating in the attack, now covering and executing feints, now jamming and suppressing, keeping firm hold of the initiative in the air battle." They "shot down several blue force combat aircraft and then firmly seized air supremacy."[55]

The strikes covered a predictable set of targets, as envisioned in PLA doctrinal writings. The attack was conducted by "several dozen aircraft of various models [that] formed an air-operation cluster and set up a firepower network of joint operations spanning across ground, sea, air, and space."[56] The "bomber group searched intensively" for the blue force's "command post, communication facilities, and firepower points," and the sites were initially found via "ground, sea, air, and space reconnaissance" but were "re-verified" before the strikes with "a formation of reconnaissance aircraft."[57] The group used "photographic and electronic means to gain a clear idea of the blue force's manpower disposition and weapon arrangement."

The exercise also simulated precision maritime strikes by PLAAF bombers. Similar to the ground strikes, "the bombers formed the mixed formation [*hunhe biandui*, 混合编队] with the fighter fleet and moved at a very high speed toward the target in distant sea several thousand kilometers away."[58] An advance formation of "early warning aircraft, ships, and electromagnetic jamming of the red force . . . implemented nonstop electronic jamming and suppression against the blue force, thus opening a safe passage for the air combat formation [*kongzhong zhanji biandui*, 空中战机编队]." The fighters were also refueled in-air.[59] This flight was labeled as a coherent package, as the article says the "air combat aircraft formation was a system-of-systems net of joint operation that incorporated multiple elements of selected information and firepower attack, long-distance assault, reconnaissance and early warning, electronic jamming, inflight refueling, special operations [*tezhong zuozhan*, 特种作战], air rescue, and comprehensive support." This operation was framed as dependent on seizing "information superiority," reflecting Cliff's view that the PLAAF puts unique emphasis on this component of air operations.[60]

Reviewing Mission Action–2013C, PLAAF Command College professor Wang Mingliang described it as the "successful realization of system-of-systems operation" and "[signifying] that the Air Force has possessed the major

strategic value of quickly mustering military strength in any strategic direction and making quick reaction to various types of sudden events."[61] Presaging the 2015 flights, the "next step" for "system-of-systems operation forces building" would be in the "maritime operation battlefield."[62]

PLAAF Overwater Bomber Training, 2015–Present

Since 2015, Chinese sources have placed greater emphasis on exercising the full bomber strike package. This focus is evident in the PLAAF's discussion of these flights in the context of SOS operations, reflecting the doctrinal view of bomber operations as an "air operational system" [*kongzhong zuozhan tixi*, 空中作战体系 or *kongzhan tixi*, 空战体系].[63] A *Kongjun Bao* article on the 19th Party Congress stated, "Such training flights . . . extended from one type of aircraft to system-of-systems training together with fighter aircraft, tanker aircraft, early warning aircraft, and reconnaissance aircraft."[64] The package was even highlighted in an August 2017 military parade. *Kongjun Bao* reported that "air combat group echelon formations" [*kongzhong zuozhan qunling dui*, 空中作战群领队] participated, and "early warning aircraft, command and communications aircraft, and electronic jamming aircraft were for the first time in a mixed formation in the parade."[65] This view extends to frontline commanders, as the commander of an H-6K bomber division stated that they would "persist in deepening combat realistic military training and continuously improving their ability to wage system-of-systems operations at sea."[66]

PLAAF H-6K flights throughout Asia have provided opportunities for training the different components of bomber strike packages.[67] Since 2015, the PLAAF has flown four general routes in Asia, following a pattern of each time incorporating more components of the strike package. H-6Ks have generally flown by themselves through the various routes the first time before being accompanied by reconnaissance and electronic warfare planes and then fighters. Speaking in 2016, H-6K pilot Yang Yong summarized the evolution of the bombers' overwater training for strike packages: from "the single-aircraft type flying out to have a look" to the "aircraft formation flying out for a spin" and now finally the "multi-airframe [group has] normalized training outside the island chain."[68] It appears that Chinese tankers do not fly past the First Island Chain, making it harder to track their participation in each flight.[69] AEW aircraft are touted as central to strike packages, but there is also limited explicit

Figure 2. H-6K Overwater Activity and Range

Source: *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (Washington, DC: Department of Defense, 2018), 120.

reporting on their participation. Figure 2 provides a map of key H-6K routes, and figure 3 provides a chronology of flights by aircraft type and location.

Incremental Progress Between 2015 and 2018

The first flight to include more than just bombers was the November 2015 flight through the Miyako Strait into the Western Pacific. Four H-6Ks, a

Figure 3. PLAAF H-6K Overwater Flights as Strike Packages

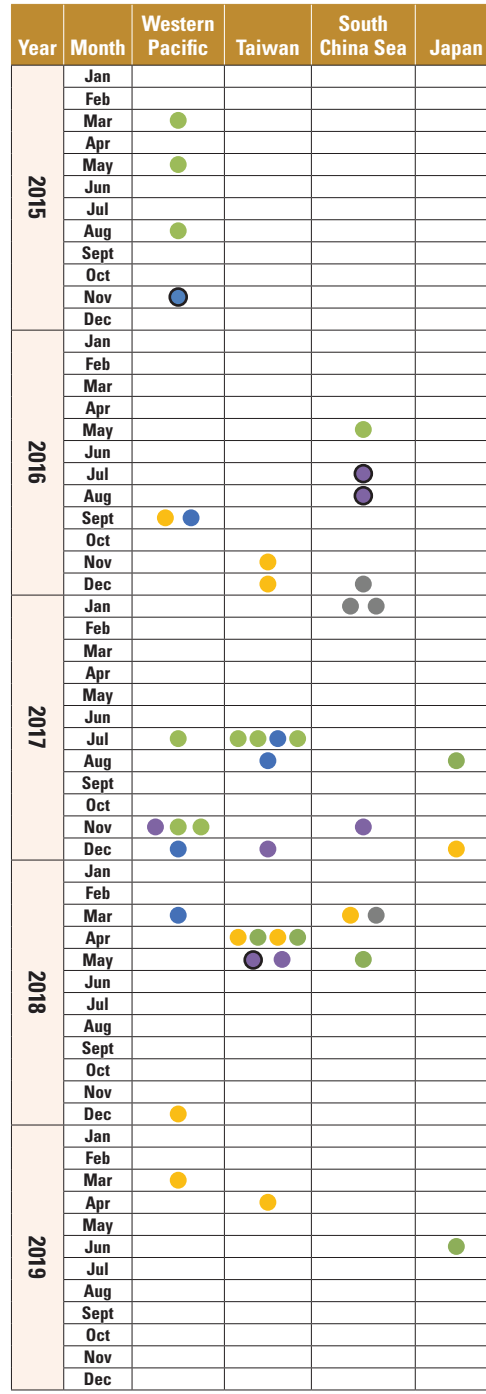
PLAAF H-6K Flights, Jan 2015-Dec 2019

Bomber Strike Package Components

- H-6K only
- H-6K + ISR/EW
- H-6K + ISR/EW + Fighters
- H-6K + ISR/EW + Fighters + Tanker
- H-6K + Unknown

● **One dot represents one flight**

○ **Represents known presence of AEW**



Source: Data updated from Derek Grossman et al., *China's Long-Range Bomber Flights: Drivers and Implications* (Santa Monica, CA: RAND, 2018), as well as PLAAF statements and social media, Chinese state-run media, Japanese Ministry of Defense reports and Taiwan MOD reports.

Tu-154, and a Y-8 intelligence plane flew through the strait while another four H-6Ks conducted a "patrol" of the East China Sea Air Defense Identification Zone, according to Japanese Defense Ministry reports (for more information, see chapter 5 by Shinji Yamaguchi in this volume).[70] Of note, there was also a Y-8 AEW plane that flew circles above the strait but did not cross it, likely providing command for the bombers and support aircraft as they flew into the Western Pacific.

The 2016 flights into the South China Sea, which followed the ruling by the Permanent Court of Arbitration nullifying Chinese territorial claims, represent the first-known entirely long-distance bomber strike package over water. On July 15, H-6Ks flew over Scarborough Shoal, supported by J-10 and J-11 fighters and reconnaissance, AEW, and tanker aircraft.[71] PLAAF spokesperson Shen Jinke said the aircraft conducted "aerial reconnaissance, aerial confrontation, and island cruising." On August 6, another flight of H-6Ks flew over Scarborough Shoal, supported by Su-30s, KJ-200 AEW, and unknown reconnaissance and tanker aircraft.[72] Shen provided more details this time, saying the planes "took off from multiple airfields, carried out this South China Sea combat patrol mission, and built a unified operational system of maritime air superiority, penetration, and strike and support forces." He also noted that the aircraft trained for "reconnaissance and early warning, aerial confrontation, and island cruising," and that the Su-30s conducted aerial refueling twice. This exercise broadly reflects the components and responsibilities of a bomber strike package—and clearly indicates the PLAAF's desire to demonstrate such capability over disputed territories as a signal to rival claimants.

The largest formation came in September 2016, when the PLAAF claimed that 40 aircraft flew into the East China Sea.[73] Spokesperson Shen said, "H-6K, Su-30, tanker, and other types of aircraft formed a system to fly through the Miyako [Strait]. Today, more than 40 aircraft of all types quickly completed preparations and took off from deployed airfields to start training in the Western Pacific, [including] reconnaissance and early warning, maritime strike, aerial refueling, and other training subjects to test the Air Force troops' distant sea operational capability." However, according to the Japanese Defense Ministry, only four H-6Ks, one Tu-154 intelligence aircraft, one Y-8 intelligence aircraft, and two unnamed fighters (the Su-30s)

actually crossed the strait into the Western Pacific.[74] Moreover, unlike the previous flight, no AEW plane guided the bombers and support aircraft from within the First Island Chain; the broader strike package apparently stayed within the First Island Chain and only a smaller group trained in the Pacific. More recently, 12 H-6K bombers were reported to have flown into the South China Sea on March 27, 2018, representing the highest number of bombers specifically noted.[75]

In 2017, the PLAAF demonstrated its ability to fly multiple routes simultaneously. On July 13, 2017, two groups of H-6Ks flew through the Bashi Channel and Miyako Strait on the same day for the first time.[76] This marked the first time the PLAAF had conducted two flights in one day. The fact that the two formations flew from different directions indicates that two different theater commands cooperated to synchronize their flights, which would be a valuable capability in a regional bombing campaign.[77] The four H-6Ks flew out through the Bashi Channel, circumnavigated Taiwan, and returned through the Miyako Strait; the two H-6Ks that flew through the latter chokepoint continued into the Western Pacific. This formation could simulate simultaneous strikes on U.S. military facilities in Guam and Taiwan. A week later, two groups of H-6Ks circumnavigated Taiwan on the same day for the first time: one flying from south to north, another from north to south.[78] This arrangement could represent strikes on Taiwan from two directions. All of these July flights were framed as contributing to the PLAAF's development of SOS operations for distant sea missions.[79]

The scope expanded to three routes several months later. On the same day in November 2017 the PLAAF flew three H-6K formations: through the Miyako Strait and Bashi Channel, and into the South China Sea.[80] Spokesperson Shen said these flights reflected the PLAAF's "normalization, systemization, and greater realism" of H-6K flights over water and asserted that the air force's SOS capability "[was] becoming stronger and stronger, improving its real war capability to respond to all types of security threats in the maritime direction."[81] This trend was made explicit when the PLAAF acknowledged that the Southern and Eastern Theater Commands (TCs) had "coordinated" the May 2018 flights that circumnavigated Taiwan at the same time.[82] This flight represents a further improvement on coordinating bomber flights across the TCs, which would be key to organizing a simultaneous strike on multiple regional targets.

In another development, the March 23, 2018, flight into the South China Sea included Su-35 aircraft for the first time.[83] Spokesperson Shen said the H-6Ks and Su-35s conducted a "joint combat patrol" and trained for "air combat, penetration, and strike," hailing the Su-35's ability to perform air combat and precision strikes against ground and maritime targets. The Su-35 also joined H-6Ks through the Bashi Channel for the first time in May 2018, though it did not follow the bombers as they circumnavigated Taiwan.[84] The Su-35's first flight past the First Island Chain with H-6Ks was hailed as a "new enhancement for the Air Force's system-of-systems operational capability."[85] *Kongjun Bao* later stated:

> *On 11 May, the PLA Air Force organized multiple early warning aircraft, reconnaissance aircraft, bombers, and fighters to carry out two-way system-of-systems patrol flights around the Taiwan Island. Airmen of an aviation brigade subordinate to the base piloted new-type warplanes to set up an aerial operations system together with other friendly units. They closely collaborated in the battle patrol mission in the distant sea area, displayed consummate skills and tactical performance.*[86]

During this period, the PLAAF also used a broader range of airfields to enhance flexibility and resiliency in a conflict. In November 2017, one H-6K flight that flew into the Pacific was described as taking off from an "interior" base and "was interpreted by PLA commentators as putting the Second Island Chain, and thus implicitly Guam, within range of H-6K missiles," likely by extending the flight range without actually flying closer to Guam.[87] More recently, Wang Mingzhi described an H-6K landing on Woody Island in May 2018 as "innovating" the PLAAF's distant sea combat model and creating a "joint air operational system" [*lianhe kongzhong zuozhan tixi*, 联合空中作战体系] because the bombers landed at a PLAN airfield (even if there was no evidence of more substantial cooperation with the navy).[88] Finally, the PLAAF has also deployed from multiple airbases in the same exercise, which presents a new challenge for aircraft to rendezvous in flight.[89]

Theory vs. Practice

Bomber operations between 2015 and 2018 shed light on the relationship between doctrine and how bomber strike packages have been developed in practice. First, it is difficult to bin all of the aircraft in these flights into the specific subsystems envisioned by PLAAF doctrine (for example, assault and escort).

Multiple variants of the Y-8 and the multiple roles fighters can play make it impossible to understand which parts of the full bomber strike package the PLAAF is exercising; however, the air force clearly wants to signal that it is improving this capability. For instance, the PLAAF's official Weibo account noted that the flights on May 11, 2018, demonstrated "the unified actions of command and control, accompanying and cover, early warning and reconnaissance, bomber strikes, support and cover to build a maritime air combat forces system."[90] That phrasing covers most functions within a bomber strike package.

Second, the formation size is usually much smaller than what likely would be employed in an actual operation, especially judging by PLAAF modeling work. PLAAF modeling research envisions 24 to upward of 120 bombers, plus an equal number of support aircraft, whereas the most bombers identified in practice was a late March 2018 flight, over a Vietnamese-held island in the South China Sea, that involved 12 bombers and the September 2016 flight, which featured 40 total aircraft. Usually just two fighters are in each package, which represents the standard fighter-to-bomber ratio employed for PLAAF modeling of between 1:2 and 1:1.

Third, the lack of routine participation by AEW aircraft does not accord with the central role portrayed in PLAAF publications and pre-2015 exercises.[91] This disconnect might simply reflect gaps in the public record of these flights, or it might suggest the PLAAF does not perceive a need to provide airborne control in routine training. If the latter is the case, the incorporation of AEW aircraft in the future would suggest more realistic training. AEW is often involved when there are new components on new routes, but otherwise it is rarely reported to be employed. AEW participation was first included for the November 2015 flight that added Tu-154 and Y-8 aircraft. AEW was also included for the South China Sea flights in July 2016 that included J-10 and J-11 fighters for the first time, and then in August for the first Su-30 fighters. AEW appeared again in the May 2018 flights around Taiwan that featured the Su-35 for the first time on that route. Based on this pattern, AEW may also have flown with the March 2018 flight into the South China Sea that first incorporated the Su-35, though the PLAAF only noted the presence of "other aircraft." Similarly, there was no reference to AEW aircraft for the other March 2018 flight into the South China Sea that featured 12 H-6Ks, which ostensibly would benefit from mid-air coordination.[92]

Training Purposes for Bomber Flights

PLA bomber flights throughout Asia since 2015 have served several interrelated purposes.[93] First, there is the obvious value of training for pilots and crew. Second, these flights act as deterrence signaling to communicate China's capability and resolve, especially over disputed territories such as those in the South China Sea. Third, they clearly have been part of China's broader pressure campaign against the Tsai Ing-Wen administration in Taipei, as both deterrence signaling and psychological warfare against the Taiwanese population. Fourth, the flights bolster the PLAAF and broader PLA's domestic standing for nationalist propaganda. Fifth, these flights are opportunities for intelligence collection against adversary intercepting aircraft and ground-based radar.[94] Sixth, they wear down those adversary air forces that scramble to intercept them. Seventh, they normalize Chinese presence in these areas, which could be later used to disguise the initiation of hostilities in a future conflict.

As operational training, most, if not all, of these flights are intended to simulate strikes against wartime targets, including U.S. bases and regional countries. The PLAAF itself has claimed they have operational value: Spokesperson Shen Jinke said in December 2016 that "in the two years of distant sea training, the PLAAF had . . . engaged in training for reconnaissance and early warning, maritime patrolling, maritime assault, and mid-air refueling, among others, thereby improving distant sea mobility and testing distant sea combat ability."[95] Moreover, Liu Rui, the PLAAF's poster child for bombers, provided a pilot's view of the operational relevance of his flights into the South China Sea:

> *Liu Rui took every session of training as actual operations. In the course of carrying out missions of patrolling islands and reefs, and missions of regularized combat readiness patrol over the South China Sea, he took vessels at sea and islands as reference objects to conduct operations-oriented realistic training. He requires that target photos, information about the deployment of ground-based missiles and radars, and battlefield environment parameters be distributed to the air crews only when tasks were assigned so that the crew members have to conduct mission planning, design penetration tactics, and stage electronic warfare all on an ad hoc basis. Such practices effectively forged the force's flexible striking capability, and validated multiple sets of tactics and combat methods for delivering precision strikes on maritime targets.*[96]

Although the PLAAF has never officially named any targets and consistently claims that the flights are not targeted at any specific country, at least one PLAAF research article on bomber strike packages lists a wartime scenario refueling location, via global positioning system coordinates, over the South China Sea, suggesting a strike on the Philippines or Australia.[97] Another article on package modeling clearly targeted U.S. intervention in a Taiwan scenario.[98]

Although official sources are not explicit, there are good reasons to think that U.S. airbases and other military sites in the Western Pacific are among the PLAAF's key targets. As *Strategic Air Force* explained, a longstanding goal of PLAAF power projection was to develop airpower that could reach U.S. military bases in the Second Island Chain. This contact would be needed to complicate or prevent U.S. intervention in a range of regional conflicts, especially a war over Taiwan. Specifically, the volume notes that the PLAAF should "build strong offensive airpower, bring the first and second island chains into the range of our striking force, force the U.S. military to retract its defense line, and effectively eradicate the containment imposed by the first and second island chains."[99] Under their suggested timeline, from 2000 to 2010, the authors called for "[improving] research and production of . . . a new generation of strategic bomber aircrafts" and from 2010 to 2030 "[researching] all-new strategic bomber aircrafts."[100] Looking at the PLAAF's actual developmental timelines, this call aligns fairly well with the rollout of the upgraded H-6K in the mid-2010s and the in-progress H-20 that may arrive sometime in the late 2020s.

The U.S. Department of Defense (DOD) has publicly stated that flights into the Western Pacific are targeted at Guam.[101] In October 2017, *Defense News* quoted a DOD official as saying, "The PRC is practicing attacks on Guam," adding that H-6Ks "are testing U.S. defense zones around Guam."[102] Perhaps the first reported assertion of these flights' intentions was in a May 2016 U.S.-China Economic and Security Review Commission report, which said that "a senior Japanese military official told the Commission [the November 2015 flight] was likely a simulated attack on Guam."[103] The 2018 Office of the Secretary of Defense annual report on China asserts, "H-6K bomber flights into the Western Pacific Ocean demonstrate China's ability to range Guam with air-launched [land-attack cruise missiles]."[104] It adds that these flights were "likely training for strikes against U.S. and allied targets. The PLA

may continue to extend its operations beyond the First Island Chain, demonstrating the capability to strike U.S. and allied forces and military bases in the western Pacific Ocean, including Guam."[105]

Bomber flights within the First Island Chain are targeted at China's regional rivals as well as at U.S. military assets operating near China. Given the route taken by many of the flights, as detailed in the last section, Taiwan is the most obvious target. Flights around Taiwan are a clear signal by the PLAAF that it plans to operate on the east coast of Taiwan in a conflict, suggesting an assumption of achieving air superiority over the island. Many targets are possible: because Taiwanese defense planning assumed that the eastern side of the island was safer than the west coast, which is exposed to China, many installations are on the east coast.

Countries that host U.S. military forces may also be a target, even if they are not rival claimants. The South China Sea flights could also be relevant for targeting Singapore, which hosts U.S. Navy ships and is well within CJ-20 range from the northern part of the South China Sea. The May 2018 H-6K landing at Woody Island also hints at the possibility of bombers based in the South China Sea, which could then extend the range of operations to Australia, according to DOD.[106] The PLAAF could strike Australia on a flight from the mainland, but even with the CJ-20's extended range, H-6Ks would have to launch somewhere over the Philippines to reach Australia.[107] The PLAAF modeling article that specifies aerial refueling as located in the South China Sea suggests this may be under consideration and is already a concern for Australia.

China's territorial rivals in the South and East China seas are also apparent targets. One case concerns the Philippines, based on the summer 2016 flights over Scarborough Shoal. This action was clearly for deterrence signaling, but it also provided experience flying near Philippine airspace. Vietnam, another rival claimant, is also a potential target: The PLAAF has similarly flown over Alison Reef, a Vietnamese-held feature in the Spratlys.[108] A final target for these operations is Japan, as indicated in flights through the Tsushima Strait and along the Kii Peninsula's eastern coastline. DOD asserts these operations have "demonstrated a maturing capability for H-6K bombers to conduct off-axis strikes against U.S. and allied facilities."[109] These could specifically target Misawa in Japan's northwest and Yokota on Japan's east coast, among other options.

Conclusion

As discussed in this chapter, China has blended theory and practice to introduce a more capable overwater bomber capability centered on bomber strike packages. China has been training for bomber strike packages since perhaps the early 2000s and certainly since 2009. Most prominently, H-6Ks have led packages past the First Island Chain since 2016, signifying the expanding reach of the PLAAF. These missions have various motives, including signaling China's adversaries and demonstrating the PLAAF's evolution into a "strategic air force," but the most concrete benefit is operational training for aircrews that might one day be tasked with carrying out air raids against targets in and beyond the First Island Chain.

Several benchmarks track the PLAAF's progress toward an enhanced warfighting capability. First is larger formations of bombers, bringing practice more in line with doctrine. Second is more flights being conducted at once, with a focus on inter-theater coordination for synchronized timing of theoretical strikes on regional targets, such as U.S. bases. Third is more regular participation of AEW and tankers, especially farther from China, to support extended range and increased realism. Fourth is deeper Chinese cooperation with Russia, building on their July 2019 joint bomber patrol, which could help the PLAAF absorb Russian operational experience and tactics, techniques, and procedures. Fifth is longer and more frequent flights for pilots and crews, to gain more flight hours, and expanding the number of crews conducting these flights.[110] Sixth is the publication of additional PLAAF doctrinal texts that incorporate lessons learned from these flights.

All of the steps outlined above would represent linear progress based on recent developments; however, several variables will determine whether PLAAF bomber exercises and operations deviate in important ways from past practice. First is whether, and how, the PLAAF incorporates new types of aircraft into its bomber strike packages. One example would be introducing UAVs or UCAVs, along the lines of manned/unmanned teaming.[111] This shift would align with years of PLAAF research and follow the U.S. model. The PLAAF developed UCAVs as early as the mid-2000s with converted J-8 fighters. These assets could serve as cover aircraft for the H-6Ks or be used in a basic suppression of enemy area defenses role.

Although there has been no observed UAV participation in overwater bomber flights, there are indications this may change soon. The bomber package that participated in a military parade at the PLA training ground in Zhurihe, Inner Mongolia, in August 2017 reportedly included a UAV. As *Kongjun Bao* noted, "From this type of formation, we can roughly see the shape of an aerial informationized operations system that has the early warning aircraft at its core; it is backed by bomber and fighter aircraft; it is supported by tanker, transport, and electronic warfare aircraft; and it integrates manned and unmanned aircraft."[112] The only other reference to a UAV role in strike packages came in an October 2017 *Kongjun Bao* article profiling the PLAAF experimental training base (presumably Dingxin): "Early warning aircraft, fighters, bombers, and UAVs were involved in the combat operations, jointly practicing tactics in system of systems operations under informationized conditions."[113] This effort suggests that the PLAAF may be moving toward integrating UAVs or UCAVs into strike packages.

The PLAAF may also introduce new piloted aircraft; within a decade, for instance, the H-20 could provide China with intercontinental strike capability fashioned after the U.S. B-2. The B-2 does not require a full package, meaning a future H-20 strike could be conducted independently, especially if China does not establish sufficient overseas basing to provide aerial refueling to support aircraft. Moreover, the arrival of the nuclear-capable H-6N will introduce a nuclear mission for the PLAAF, but the real impact will likely be its extended range and multi-role capability. The H-6N is air-refuelable, extending the reach of China's bomber force, and has dropped the airframe's traditional bomb bay for a modified fuselage that is assessed to carry an external payload. While one known use will be the nuclear-capable air-launched ballistic missiles reported by the U.S. Government,[114] another use could involve an air-launched version of an anti-ship ballistic missile, such as the DF-21.[115] It could also carry a UAV, such as the WZ-8 stealth drone that appeared in the 2019 parade; that drone is designed to fit under an H-6N.[116]

In addition, the 2019 Defense Intelligence Agency report on the Chinese military mentioned a future next-generation stealth tactical medium-range fighter-bomber.[117] This multirole stealth aircraft, depending on its own performance, may not require a full strike package.[118] As one report argued,

"Smaller fighter-bombers added advantages when it comes to sortie rates and for successfully penetrating through an enemy's integrated air defense network. Above all, it allows for multi-role operations, including supporting long-range air-to-air missions, without a heavy reliance on vulnerable tankers or even the use of coastal airfields, which would be the most susceptible to attack during an all-out conflict."[119]

Second is whether the PLAAF follows the PLAN Marines and PLAN Aviation by deploying to overseas bases (for more on this topic, see chapter 3 by Isaac Kardon in this volume). Although China's first base in Djibouti has a short runway of 400 meters, a PLAAF permanent presence there seems unlikely so far due to a lack of supporting infrastructure and overall mission focus.[120] If the PLAAF does go abroad, a more likely basing option would be Cambodia, as a Chinese-built "commercial" airport in Dara Sakor appears to be dual use, if not solely for military use.[121] A base in Cambodia would afford PLAAF bombers another route for strikes on Southeast Asia and Australia, complicating their defenses. China's military airfields in the South China Sea could also be an important stepping stone for an outward expansion, but because they are run by PLAN Aviation, use of those facilities by the PLAAF is not assured.

A future base in South Asia (perhaps Pakistan or Sri Lanka) would project power beyond East Asia, offer another location for combat strikes against India, and extend the PLAAF's operational range toward Africa and Europe. Bases in the Western Pacific could also extend bomber range against the United States, though those prospects appear much lower. One option would be to follow the U.S. model and only base support aircraft, such as tankers, abroad and simply refuel Chinese bombers and escorts as necessary for overseas missions. PLAAF researchers have commented on the geopolitical sensitivities and lack of demand for "overseas air transportation support bases" [*jingwai hangkong yunshu baozhang jidi*, 境外航空运输保障基地], suggesting overseas basing is at least under consideration.[122]

Third is whether PLAAF bomber operations focus on new targets. So far, China does not appear to have conducted deterrence flights against India; however, the PLAAF could conduct such flights around the Sino-Indian border and in wartime could simply fly overland or even launch strikes from Chinese territory. Indeed, an overwater flight path is unlikely unless the PLA is able to secure overflight permission from a neighboring country such

as Pakistan or Myanmar. Bombers could also be used for counterterrorism missions in Central Asia, but these operations would presumably require the approval of the countries involved, and Chinese training for those missions could be accomplished within/inside of China. Another area would be flights past the Second Island Chain, toward either Alaska or Hawaii, including flights through North Korean or Russian airspace near the Arctic. As the China-Russia relationship deepens, perhaps one location for a future joint bomber patrol is off the coast of Alaska.[123]

The evolution of PLAAF bomber strike packages will also depend on the PLA's ability to resolve several deficiencies. One weakness is in personnel and training. An example of human capital problems can be found in Chinese reporting on the Mission Action-2013C exercise. The regiment commander noted the importance of the human factor: it "required the new generation of commanders and fighters to not only be proficient with the knowledge and skills associated with their own specialties, but also have thorough understanding of the weapon performance and target attributes of other arms of the forces in the system of systems."[124] The review of the maritime strike flight described the "psychological and physiological test of the long flight" as a challenge for the bomber crew's performance.[125]

While the PLA has worked to address those problems, some impediments remain, such as the roughly 10 hours per month flight time limit imposed by the PLAAF; this amount is likely less than half that available for a U.S. Air Force pilot (indeed, an intercontinental B-2 flight from Missouri to Libya and back took 34 hours).[126] This limit means that one long-range bomber flight into the South China Sea is the only flight time a pilot would have during a given month.[127] Thus, on basic issues of pilot endurance, PLAAF pilots have inadequate comfort with flights longer than a couple hours. Such issues reflect a steep learning curve for the PLAAF and stand in sharp contrast to the more than 70 years that the U.S. Air Force has had to refine its overwater operations in the Pacific.

Other problems concern the quality of training. One 2018 *Kongjun Bao* report on the Southern TC bomber base remarked that "we now have 'training supervisors,' whose sole purpose is to fight fraud, sham, and laziness . . . officers and soldiers are now under a high level of pressures. . . . Every time they train, they must bring another pair of eyes to review whether everything

meets combat-realistic requirements or anything is bloated or scientifically unsound."[128] Although it seems difficult to "fake" a 10-hour bomber flight, the PLAAF's long history of avoiding the difficulties of actual integration raises questions about wartime effectiveness. Failure to address these problems could hamper future PLAAF bomber operations, especially in combat.

Another challenge is that, as it reaches the technological frontier, the PLAAF will have less of an ability to draw lessons from foreign experiences. As documented above, China benefited immensely by learning from U.S. bomber operations over the several decades of wars in the Middle East. As the United States and China develop next-generation stealth bombers in parallel, both sides will likely have to contend with similar technological and operational problems, meaning China will have to find its own way on at least some challenges. However, insofar as the H-20 will be China's first strategic stealth bomber, the B-2 may still prove a sufficient model to emulate in many respects.

Aerial refueling may be a critical shortcoming for longer range missions. Although the PLAAF's present challenge of limited tanker aircraft—only 13 in 2019—will likely be resolved with the Y-20U tanker variant, the bigger test will be overseas basing.[129] For a PLAAF bomber mission against Hawaii, for example, the H-6K/N would be best supported by aerial refueling past the Second Island Chain. A PLAAF base in Oceania could accomplish this goal, but despite reported PLA interest, prospects appear dim, and any base would be highly isolated—and thus vulnerable in a war. Therefore, the Hawaii and U.S. homeland missions are much more likely to be executed by the H-20, leaving the H-6K/N for regional missions within Asia.

An additional challenge concerns interservice rivalry and limited "jointness." Under the traditional division of labor, the PLAAF has concentrated on land strikes and PLAN Aviation has handled maritime strikes.[130] However, given the PLAAF's expansion into the maritime domain, the prospects for a PLAAF role in striking ships or other maritime targets cannot be ruled out. Bureaucratic resistance from the PLAN will likely be high, but the PLAAF's advanced aircraft may give it a leg up in interservice competition. Another marker would be deeper cooperation as the PLAAF pushes farther from its bases, with PLAN ships providing useful support in such areas as intelligence, surveillance, reconnaissance, guidance, and search

and rescue.[131] Recent exercises have not demonstrated a high level of integration between the two services, but if that were to develop, Chinese bombing could be more effective, lethal, and taxing for China's neighbors and the United States.

The author would like to thank Dave Frelinger, Ed Burke, Mark Cozad, Mike Chase, and Jeff Engstrom for their research guidance and Lonnie Henley, Jackie Newmyer Deal, Phil Saunders, Joel Wuthnow, Ken Allen, and Jeremy Ward for helpful feedback on the conference draft.

Notes

[1] For some discussion of PLAN Aviation training for bomber strike packages, see Wang Tianxiang, Li Binfu, and Li De, "Invincible Horizon Eagle Formation: Record of Actual Events on a Division of the North Sea Fleet (NSF) Aviation Strengthening the Building of Fighting Capacity by Conducting Training According to the Outline," *PLA Daily*, February 3, 2010, 2; Zhang Dabin and Gao Yi, "Night Training Says Goodbye to 'Calm Wind and Waves,'" *Renmin Haijun*, May 18, 2015, 3; Zhou Shiwei and Gao Hongwei, "Many Aircraft Coordinating, Hacking at an Obstinate Enemy in the Clouds: South Sea Fleet Aviation Organizes Multi-Branch Joint Opposing-Forces Training Exercise," *Renmin Haijun*, August 11, 2015, 2; and Gao Hongwei, "South Sea Fleet Aviation Forces: 'Multi-Type of Aircraft Carry Out Offensive/Defensive Confrontation Drills in Open Sea,'" *PLA Daily*, December 23, 2017, 1.

[2] Mark Cozad and Nathan Beauchamp-Mustafaga, *People's Liberation Army Air Force Operations over Water: Maintaining Relevance in China's Changing Security Environment* (Santa Monica, CA: RAND, 2017); Derek Grossman et al., *China's Long-Range Bomber Flights: Drivers and Implications* (Santa Monica, CA: RAND, 2018).

[3] Andrew Scobell, David Lai, and Roy Kamphausen, eds., *Chinese Lessons from Other Peoples' Wars* (Carlisle, PA: Strategic Studies Institute, 2011).

[4] Zhang Yuliang [张玉良], ed., *The Science of Campaigns* [战役学] (Beijing: National Defense University Press, 2006), 170–176.

[5] Ibid.; Wu Wenjun [武文军], Li Hongxing [李红星], and Wang Jianfei [王剑飞], "Long-Range Strikes in U.S. Military Air Raid Operations" [美军空袭作战中的远程奔袭], *Conmillit* [现代军事] (June 2003), 56–58.

[6] People's Liberation Army Air Force [中国人民解放军空军], *China Air Force Encyclopedia* [中国空军百科全书], volume 1 (Beijing: Aviation Industry Press, 2005), 82.

[7] Zhang, ed., *The Science of Campaigns*, 170–176. For PLAAF reference to U.S. jointness in an exercise, see Zhang Li, Zhao Lingyu, and Li Jianwen, "System of Systems Operations: Sword Pointed at the Future Battlefield: Summary of Highlights of the Trans-Regional Mobile Campaign Exercise Mission Action–2013C," *PLA Daily*, September 30, 2013, 2.

[8] 制空权 is also translated as "air superiority," "air supremacy," or "air dominance," but the most direct translation is "command of the air." Thanks to Ken Allen for this point.

[9] Zhang, ed., *The Science of Campaigns*, 170–176.

[10] Shou Xiaosong [寿晓松], ed., *The Science of Military Strategy* [战略学] (Beijing: Military Sciences Press, 2013), 91.

[11] Zhu Hui [朱晖], ed., *Strategic Air Force* [战略空军论] (Beijing: Blue Sky Press, 2009).

[12] Shou, *The Science of Military Strategy*, 227.

[13] Zhang, ed., *The Science of Campaigns*, 112–115, 316–323.

[14] Ibid., 316–323.

[15] Ibid. For an academic article similar to this doctrine, see Zhong Jilong [钟季龙] et al., "Research on Phased Mission Based Efficient Reliability Evaluation Algorithm for Equipment System of Systems" [装备体系多阶段任务可靠性高效解析算法], *Systems Engineering and Electronics* [系统工程与电子技术] (January 2016), 232–238. For an example of PLAAF research on bomber strike allocation supporting a Taiwan amphibious landing, see Gao Xiang [高翔], Wang Jianping [王建萍], and Zhang Jineng [张吉能], "Optimization Prediction Simulation of Air Ammunition Consumption in Air Combat" [关于空战中航空弹药消耗量优化预测仿真], *Computer Simulation* [计算机仿真] (June 2018), 33–36.

[16] For an article referencing mobile targets, see Wang Jian [王健] and Li Weimin [李为民], "Research on Optimizing the Employment of Military Strength for Aviation in Air Attack Operation" [航空兵空中进攻作战兵力使用方案的优化], *Fire Control and Command Control* [火力与指挥控制] (November 2007), 46–49. For a reference in training, see Zhang Li, Wu Aili, and Zhao Lingyu, "System-of-Systems Operation Directs Sword at Distant Sea: Witnessing Air Force's Trans-Regional Maneuver Campaign Exercise 'Mission Action–2013C,'" *Kongjun Bao*, November 1, 2013, 1; and Qiao Songbai, Yu Hongwei, and Mu Yuntao, "Ask the Pathfinders About the 'Way': Observations of and Reflections on the Steadfast Advancement in Combat Realistic Training of a Southern Theater Command Air Force Aviation Regiment, a PLA-Wide Training Outstanding Unit," *Kongjun Bao*, February 28, 2018, 1.

[17] All-Military Military Terminology Administration Commission [全军军事术语管理委员会], *People's Liberation Army Military Terminology* [中国人民解放军军语] (Beijing: Military Sciences Press, 2011), 967.

[18] Ibid.

[19] For broader context on SOS operations, see Jeffrey Engstrom, *Systems Confrontation and System Destruction Warfare: How the Chinese People's Liberation Army Seeks to Wage Modern Warfare* (Santa Monica, CA: RAND, 2018).

[20] Zhang, ed., *The Science of Campaigns*, 170–176.

[21] For one example of this emphasis in training, see Zhang, Wu, and Zhao, "System-of-Systems Operation Directs Sword at Distant Sea."

[22] For training, see Zeng Ke and Fan Yishu, "Information Sharing Boosts Combat Effectiveness as Aviation Unit of the Southern Theater Air Force Participates in Joint Ground-Air Opposing-Forces Training Exercise," *Kongjun Bao*, October 31, 2016, 2. For academic research, see Deng Qiling [邓祁零], Zhang Miao [张淼], and Tao Xiaobao [陶小宝], "Development Trends in U.S. Military Air Force Operations" [美军空袭作战发展趋势], *Winged Missiles* [飞航导弹] (April 2011), 6–10; and Wang and Li, "Research on Optimizing the Employment of Military Strength for Aviation in Air Attack Operation," 46–49.

[23] Zhong Jilong [钟季龙] et al., "Research on Phased Mission Based Efficient Reliability Evaluation Algorithm for Equipment System of Systems" [装备体系多阶段任务可靠性高效解析算法], *Systems Engineering and Electronics* (January 2016), 232–238. For a different phasing, see Yang Yinghui [杨迎辉] et al., "Adaptive Evolution Modeling for Networked Operational Information Flowing Strategy" [网络化作战信息流转策略适应性演化建模], *Systems Engineering and Electronics* (July 2017), 1513–1523.

[24] Wang and Li, "Research on Optimizing the Employment of Military Strength for Aviation in Air Attack Operation." The 2007 *Military Balance* lists China with only 10 tankers, all HY-6s, and another 8 IL-78s coming down the road from Russia. See *The Military Balance 2007* (London: International Institute for Strategic Studies, 2007), 350. China did convert some of its antiquated J-6 fighters into UCAVs by at least 2010 but they are not suited to this role. See John Reed, "Meet China's New-Old Killer Drones," *Foreign Policy*, January 8, 2013, available at <https://foreignpolicy.com/2013/01/08/meet-chinas-new-old-killer-drones/>.

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CHAPTER 9

PLA Operational Lessons from UN Peacekeeping

By Joel Wuthnow

One of the key manifestations of the People's Liberation Army's (PLA's) emergence as an "incipient" expeditionary force has been its participation in United Nations (UN) peacekeeping operations (PKOs)—most of them in Africa, Southeast Asia, and the Middle East—over the past 30 years.[1] China's 2019 defense white paper notes that, through the end of 2018, more than 39,000 PLA troops had served in 24 PKOs, including 13 who were killed in the line of duty.[2] While this represents a very small fraction of the millions of personnel who have served in the PLA ground forces since 1989, it signals a notable shift from Beijing's previous reluctance to deploy troops overseas in any operational capacity. Today, it is taken for granted that China—currently the UN's 10th-largest troop-contributing country—will provide "boots on the ground" in a variety of missions. Recent innovations that mark the PLA's advancement into a more substantial troop provider include deploying infantry battalions and helicopter units to some missions.

What operational value, if any, does the PLA derive from its decades-long participation in UN PKOs? Most analyses describe PLA participation in UN missions as an *output* of changing foreign policy priorities and a growing Chinese tolerance for the more complex "peacebuilding" missions that have

defined UN peacekeeping since the end of the Cold War.[3] However, from the perspective of Chinese military development, PKO experience also constitutes an important *input*. Because the PLA lacks recent combat experience, having not fought a major engagement since 1979, it is trying to substitute other experiences to develop into an operationally proficient military. Those alternatives include "combat-realistic" exercises, advanced wargames and simulations, lessons drawn from the experiences of the United States and other militaries, hands-on operations within and around China (for example, disaster relief or patrols in the South China Sea), and overseas deployments. The last category includes activities such as international military exercises, antipiracy patrols, and PKOs.

Because PKOs do not directly simulate combat conditions and involve only a small percentage of the ground forces at any given time, questions remain about how useful this experience can be in promoting military modernization and readiness.[4] Drawing from interviews with PLA officers and other primary sources, this chapter addresses the operational value of PKOs for the PLA in four sections. The first section documents the PLA's recent presence in the field and its responsibilities. The second provides an overview of China's peacekeeping standby force, announced by Xi Jinping in 2015. The third argues that, while many of the technical skills employed in PKOs can be mastered domestically, deployments provide five unique operational benefits: learning from other troop-contributing countries, developing foreign language and cultural skills, exposing junior and midranking officers to high-risk environments, improving planning skills relevant to expeditionary operations, and providing external validation of unit readiness. The conclusion suggests that these benefits will gradually increase the PLA's capacity to operate abroad, either within or outside a PKO framework, but that the effects will be limited by a number of operational and political constraints.

A Growing Overseas Presence

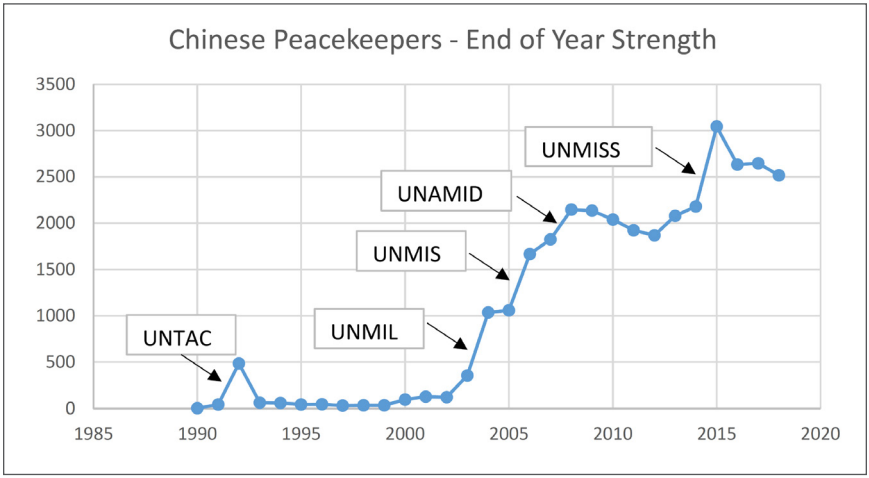
For nearly 20 years following its accession to UN membership in 1971, Beijing provided no troops for UN PKOs. This reflected several factors, including China's early experience as a supporter of North Korea in fighting UN forces during the Korean War; Chinese attitudes that UN peacekeeping was merely a tool of U.S. and Soviet hegemony in the Third World; China's marginal

economic and diplomatic interests in distant countries where PKOs were being conducted (for example, Lebanon and Cyprus); the small scale of PKOs during the Cold War; and the lack of PLA capacity and technical proficiency to contribute in large numbers.[5] Even after China began deploying troops in 1989, its contributions were largely confined to a token presence of military observers and police through the early 2000s. An exception was a 400-person engineering contingent deployed to Cambodia in 1992–1993, part of a "charm offensive" to improve China's image among a population wary of Beijing's support for the Khmer Rouge.[6]

The largest increase in Chinese troop contributions took place between 2003 and 2015. During this period, the total number of Chinese personnel deployed in PKOs jumped from 358 to 3,045. This increase can be explained by a reversal of the previous constraints: China's increasing involvement in UN affairs created a "comfort level" with UN peacekeeping, reducing suspicions about superpower manipulation; its growing overseas economic interests provided Beijing an incentive to use peacekeepers to burnish its reputation in Africa and the Middle East (and on the global stage as a "responsible stakeholder"); more complex peacebuilding missions created new demands for qualified peacekeepers; and increasing PLA capabilities, including successive cohorts of personnel with firsthand peacekeeping experience, meant that the military had more capacity to contribute.[7] Thus, Beijing dispatched peacekeepers in larger numbers to various missions, including Liberia (2004), Sudan (2006), Lebanon (2007), and Darfur (2008) (see figure 1).

Since 2015, China has deployed roughly 2,500 total personnel to PKOs at any given time. A slight dip from the peak in 2015 can be explained by the winding down of China's participation in the UN mission in Liberia, which formally ended in March 2018, and the absence of any new PKOs that would generate a demand for additional deployments. Nevertheless, China has remained the largest troop contributor among the five permanent members of the UN Security Council and a top-10 contributor among all UN member states (a status that Chinese officials routinely cite as evidence of China's contributions to global governance).[8] Moreover, in September 2015, Xi announced that China would create a "permanent peacekeeping police squad and build a peacekeeping standby force of 8,000 troops" that would be on call to assist in future missions (more details on this below).[9]

Figure 1. Total PLA Personnel Involved in UN PKOs, 1989–2018



Source: UN data.

Key: UNTAC: UN Transitional Authority in Cambodia; UNMIL: UN Mission in Liberia; UNMIS: UN Mission in Sudan; UNAMID: UN–African Union Hybrid Mission in Darfur; UNMISS: UN Mission in South Sudan.

Chinese personnel are assigned to UN PKOs in various capacities, not all of them as members of operational units. The 2,515 personnel deployed in December 2018 included 18 armed police in Cyprus and South Sudan (a notable decrease from the previous deployment of hundreds of police), 48 staff officers serving in PKO headquarters, and 30 military advisors (see figure 2). In these categories, the UN assigns billets to individual countries, but the PLA decides who will fill each billet. Volunteers, who are typically foreign language–capable junior officers, compete for these assignments. One interviewee who served as an operations planner for an African mission said that his main responsibility was identifying UN funding for infrastructure projects such as bridges.[10] At a senior level, Chinese officers have been appointed as force commanders on a few occasions. For instance, in December 2016, a PLA major general was named commander of the PKO in the Western Sahara.[11]

The remaining 2,419 personnel are *contingent troops*—that is, assigned to a unit led by a Chinese officer, who reports to an overall force commander. These personnel accounted for 3.2 percent of the 76,075 troops assigned to the UN's 13 PKOs at the end of 2018—large enough to place China high in the

Figure 2. Chinese Non-Contingent Personnel in UN PKOs, 2018

Source: UN data.

Key: MINURSO: UN Mission for the Referendum in Western Sahara; MONUSCO: UN Organization Stabilization Mission in the Democratic Republic of the Congo; UNMISS: UN Mission in Sudan; UNTSO: UN Truce Supervision Organization; MINUSMA: UN Multidimensional Integrated Stabilization Mission in Mali; UNAMID: UN–African Union Mission in Darfur; UNFIL: UN Interim Force in Lebanon; UNFICYP: UN Peacekeeping Force in Cyprus.

country rankings, but small enough that its contributions to the total UN effort remain modest. While Chinese troops in the past deployed on an 8-month cycle, they now deploy for 12 months. When the rotation cycle ends, the last batch of troops is immediately relieved by the next group, ensuring mission continuity. Predeployment training includes 3 or 4 months of preparations in a unit's home area focused on topics such as the UN Charter, foreign languages, and simulation drills, as well as a short course at the PLA's Peacekeeping Center in suburban Beijing (which also operates courses for foreign peacekeepers).[12] Management is led by the Ministry of National Defense's (MND's) Office of Peacekeeping Affairs, which coordinates with the Joint Staff Department and the PLA's representative office at the UN.[13]

Since 2013, Chinese peacekeepers have been concentrated in five PKOs: the UN Interim Force in Lebanon, the UN Organization Stabilization Mission in the Democratic Republic of Congo, the UN-African Mission in Darfur (UNAMID), the UN Mission in South Sudan (UNMISS), and the Multidimensional

Integrated Stabilization Mission in Mali (MINUSMA) (see table 1). In each of these missions, China provides engineering and medical contingents, reflecting a legacy of the PLA primarily deploying "combat support" personnel to UN PKOs. The former typically consists of a mix of engineering, logistics support, and guard squadrons, while the latter includes a Level 1 hospital.[14] The specific responsibilities of these units vary by mission but typically include building roads and bridges, maintaining UN facilities and refugee camps, and providing medical care for UN peacekeepers and local residents. For instance, Chinese engineers in Darfur have repaired UN barracks that had been damaged by excessive heat and water erosion.[15] In southern Lebanon, they have conducted minesweeping operations and erected boundary markers along the Blue Line.[16]

A departure from past practice has been the deployment of Chinese infantry to two of the five current PKOs. Since September 2013, the PLA has

Table 1. Primary UN PKOs Involving PLA Personnel

Mission	PKO Start Date	PLA Start Date	Total PLA Personnel (2018)	Total UN Peacekeepers (2018) (China as %)
UNIFIL (Lebanon)	1978	2006	418	10,317 (4.1)
MONUSCO (Congo)	1999	2001	231	17,213 (1.2)
UNAMID (Darfur)	2007	2007	374	8,341 (4.5)
UNMISS (S. Sudan)	2011	2011	1,067	16,682 (6.4)
MINUSMA (Mali)	2013	2013	403	14,572 (2.8)

Sources: UN data; various PRC Web sites.

deployed a 170-person infantry company (labeled a "guards detachment" [*jingwei fendui*, 警卫分队]) to Mali, which has protected the MINUSMA eastern sector headquarters in Gao.[17] In February 2015, a 700-person infantry battalion arrived in South Sudan. The unit, consisting of three infantry companies and a logistics support company, has guarded UN convoys and refugee camps, established temporary bases, and provided emergency assistance.[18] Dennis Blasko noted that the battalion commanders have been colonels (rather than majors, as would be expected), which could signify either the importance of the mission or a "lack of confidence that a major is ready for such responsibilities."[19] China has suffered fatalities in both missions. In May 2016, a PLA peacekeeper was among four killed in an al Qaeda attack in Mali.[20] Less than 2 months later, two Chinese troops were killed during an insurgent attack on the UN camp they were guarding in Juba.[21]

(continued)

PLA Units	Responsible Theater Command	Responsible Group Armies	Rotation Cycle Begins
Mine-clearing engineer detachment, construction engineer detachment [建筑工兵分队]; Class-1 hospital [一级医院]	Southern	74th, 75th, 77th ; Southern TC General Hospital	May
Engineer detachment, Class-1 hospital	Western	76th; former Lanzhou General Hospital	September
Two engineer support squadrons [工程保障中队], 1 logistics support squadron [支援保障中队], 1 guard squadron [警卫中队]; Class-1 hospital; helicopter detachment	Central	81st, 82nd	December (engineer, medical); August (helos)
Three engineer support squadrons, 1 logistics support squadron, 1 guards squadron; Class-1 hospital	Central	81st, 83rd; No. 980 Hospital under the JLSF	September (combat support); November (infantry)
Engineer contingent, guards contingent [警卫分队], Class-1 hospital	Northern	79th, 80th; 969 Hospital under the Joint Logistic Support Force	May

Another recent development has been the deployment of a PLA helicopter detachment to UNAMID since June 2017. The 140-person unit, which consists of 4 Mi-171 medium multipurpose helicopters, an aviation company, a maintenance company, and a logistics support company, has been assigned tasks such as "air patrol, battlefield reconnaissance, and transportation of personnel and supplies."[22] Notably, in August 2019, members of the detachment were transported to Sudan on a PLA Air Force Il-76 transport aircraft (typically Chinese peacekeepers have been ferried to and from PKOs on chartered civilian aircraft).[23]

Different PLA theater commands (TCs) take responsibility for different PKOs.[24] The Central TC is assigned both Sudan missions (UNAMID and UNMISS), accounting for a majority of PLA peacekeepers. This represents continuity with the past, in which the Beijing Military Region (forerunner to the Central TC) was assigned multiple PKOs.[25] The Southern, Western, and Northern TCs contribute troops to PKOs in Lebanon, Congo, and Mali, respectively; only the Eastern TC has not been assigned a peacekeeping mission.[26] Within the TCs, PKO deployments rotate among two or three different group armies. For instance, the 79th Group Army provided engineers and infantry personnel for MINUSMA during the 2017–2018 rotation cycle, while the 80th Group Army did so in 2018–2019. This means that in the last few months of a given deployment, there is roughly an equal number of PLA personnel in China preparing to deploy.

China's Peacekeeping Standby Force

While China's overseas PKO commitments have stabilized at about 2,500 personnel in recent years, Xi's 2015 pledge for an 8,000-person peacekeeping standby force suggested a possible future expansion of Chinese deployed troops. This was one of the largest pledges that world leaders made during a UN peacekeeping summit. Total contributions pledged by more than 50 states numbered 40,000, including specialized capabilities such as minesweeping equipment and helicopters.[27] This was the second time that Beijing had made such a commitment, though it was far more ambitious than the first. In 2002, China pledged a 525-person engineering battalion, a 25-person medical unit, and two 160-person transportation companies to be ready to deploy within 90 days. Chinese officials indicated that these units would

be included in the UN Standby Arrangement System, which was designed to monitor the status of available forces, but China reportedly never met the formal reporting requirements.[28]

The proposed peacekeeping standby force is not a single entity, but rather a set of PLA capabilities distributed in various TCs that are available to the UN in different combinations depending on mission requirements. The PLA registered these forces in the UN's Peacekeeping Capability Readiness System (PCRS) in September 2017. PCRS is a computer-based system through which the UN's Strategic Force Generation and Capability Planning Cell tracks and evaluates units that troop-contributing countries have made available for future operations. It replaced the UN Standby Arrangement System in September 2015 with an aim "to achieve a greater degree of readiness and predictability for newly deployed units" through stronger collaboration between UN headquarters and member states.[29] All units are assigned to one of four readiness levels:

- Level 1: Unit has been "fully accepted and registered in PCRS"
- Level 2: Unit has undergone an "Assessment and Advisory Visit" by UN evaluators and "has been deemed deployable"
- Level 3: Unit has its own "equipment and personnel aligned with a specific or generic UN military/police requirement"
- Rapid Deployment Level (RDL): Unit can deploy "to any UN field mission within 60 days."[30]

When new PKOs are being planned, UN officials use the PCRS to determine available capabilities and match troop contributors with missions. An interviewee explained that preference is given to units at higher readiness levels (using a Level 1 unit is like "going on a blind date").[31]

Although the specific units China has registered in the PCRS have not been announced, Chinese media accounts have provided some general details. The PLA Army announced that its contributions include 19 units in 6 categories: infantry, engineers, transportation, guards, rapid reaction, and helicopters.[32] An MND spokesman said that 28 company- and battalion-sized contingents drawn from multiple services have been assigned to the force (see table 2).[33] At a lower level, the commander of one of the 8 infantry battalions revealed that his 850-person unit consists of 3 infantry companies that

Table 2. Composition of China's Peacekeeping Standby Force

Ground Force	Air Force	Navy	Unknown
Six infantry battalions Three engineering companies Two helicopter detachments Three rapid-reaction companies	Two transport aircraft contingents	One surface ship contingent	Two transportation companies Four level-2 hospitals Two UAV companies

Source: Zhang Tao, ed., "Monthly Press Conference of the Ministry of National Defense on September 28," Ministry of National Defense, September 28, 2017, available at <http://eng.mod.gov.cn/focus/2017-09/28/content_4793398.htm>.

can "independently perform combat missions" and a multifaceted support company [*baozhang lian*, 保障连] that provides fire support, intelligence support, security protection, and equipment maintenance.[34] It is likely, but not confirmed, that the other infantry battalions have a similar composition. Although these units are on call for use in PKOs, they continue to perform their normal functions in China, such as combat readiness training and disaster relief.[35] (China's standby force also includes two police contingents.[36])

Several elements of the standby force indicate an increasing PLA capacity to contribute to PKOs (but are agnostic on China's willingness to actually deploy them). The first factor is the size: China's pledge represents more than three times the current number of deployed PLA peacekeepers (somewhat less if one also includes units in China preparing to deploy). Whether anything close to the full complement of 8,000 will ever be deployed will depend on future mission requirements, the capabilities and political preferences of other troop contributors, and China's own judgments about the costs and benefits of further deployments. At present, there is no apparent demand for these troops to be utilized. However, registering these additional units in PCRS—and subjecting them to the UN evaluation process—provides China an option to increase its participation in current or future missions.

Second is the participation of new types of capabilities. While the majority of China's current peacekeepers are combat support personnel such

as engineers and medical staff, the most prominent units assigned to the standby force are infantry and rapid-reaction forces. Registering six infantry battalions in PCRS, for instance, represents a large jump from the existing deployment of a single infantry battalion (South Sudan) and one guard detachment (Mali). This indicates that the PLA could shift to a higher ratio of combat forces in future missions. The composition of the standby force also suggests that the PLA could provide a broader range of specialized capabilities. Examples include upgraded Level 2 hospitals, greater use of army aviation capabilities, air force transport aircraft to transfer units to and from mission areas, and navy ships that could be deployed for resupply or noncombatant evacuation purposes. Chinese unmanned aerial vehicles may be used in roles such as delivering aid, establishing Internet connectivity in refugee camps, or providing surveillance of combat areas.[37]

Third is the improving readiness levels of units assigned to the standby force. China's 2019 defense white paper revealed that, following a site visit by UN inspectors, 13 units—that is, nearly half of the total—were upgraded from Level 1 to Level 2 in October 2018, while 5 of those units were elevated to Level 3 in February 2019.[38] A UN official stated that PLA units were currently graded at "all but one" of the PCRS readiness levels, suggesting that no unit was yet assigned to the RDL (meaning an ability to deploy anywhere within 60 days).[39] However, China was reportedly one of six countries that pledged to contribute troops at the RDL level at a UN conference in London in September 2016.[40] Evidence of Chinese units being assigned to higher readiness levels, and an ambition to reach the RDL, suggests that the PLA will be a "go-to" force that UN officials will look to first in planning future operations.

Operational Benefits

Participation in past and current PKOs and the creation of a larger standby force that could be employed in the future provide clear reputational benefits for China. As noted above, Chinese officials often cite China's status as a high-ranking troop contributor. China's MND releases a near-constant barrage of vignettes documenting the achievements of individual Chinese peacekeepers and units, supporting China's public diplomacy toward a domestic Chinese audience, in the host countries themselves, in the region, and vis-à-vis the international community.[41] Given the modest total number of

Chinese personnel involved in these missions, Blasko argued that Beijing has "gained significant propaganda value out of its minimal investment."[42]

The operational benefits for the PLA, however, are less clear. None of the tasks assigned to PLA personnel participating in PKOs—infrastructure repair, patient treatment, minesweeping, helicopter patrols, and force protection—require high-end weapons systems and equipment or the application of advanced warfighting doctrine. Mastering these skills can be achieved domestically through exercises conducted within the TCs and at the PLA's Peacekeeping Center in Beijing.[43] Moreover, providing PLA personnel with practical experience in difficult circumstances does not require overseas deployments. PLA training at home, which involves a far larger number of troops than have participated in UN PKOs, has focused on operations in adverse weather and terrain conditions, in addition to increasingly demanding confrontation drills and joint exercises.[44] Many Chinese troops have also gained practical experience through disaster relief and humanitarian assistance operations inside China.[45]

However, there are at least five unique benefits that PLA commanders and enlisted personnel—and in some cases, the PLA ground forces as a whole—can derive from PKO experiences. These include learning new skills from other troop-contributing countries, language skills and cultural acuity, leadership skills and unit cohesion forged in high-risk environments, insight into the requirements of planning and conducting expeditionary missions, and external motivation (and validation) for unit readiness. Each of these benefits is discussed in turn.

Learning from Others

One benefit is the opportunity to acquire new technical skills through interactions with other troop-contributing countries. China's priority has been on identifying opportunities for collaboration with advanced Western militaries.[46] A retired PLA officer explained that Chinese peacekeepers have studied the "standard operating procedures of other forces," looking especially to developed countries such as the United States, France, and the United Kingdom. This is helpful in learning "how to organize forces, which processes are effective, and how to communicate among our own forces."[47] One U.S. officer who worked alongside Chinese peacekeepers in the early 2000s observed that PLA questions sometimes "ventured into technical and military realms,"

though "cultural and linguistic differences meant that it was never clear if they wanted us to divulge secrets."[48]

Given minimal U.S. participation in PKOs in recent years, Chinese forces have more often looked to European countries to provide lessons. In October 2018, for instance, Chinese peacekeepers in Lebanon carried out an inaugural mine-clearing exercise with personnel from five European countries (and Cambodia) to "share experience in mine clearance and [explosive ordnance disposal]."[49] In Mali, Chinese peacekeepers have interacted with Dutch medics and French counterterrorism forces, potentially allowing discussions or observations of "best practices" in these disciplines.[50] Chinese officials have also promoted more regular cooperation between the PLA and European Union battlegroups in Mali.[51] Such an experience could provide lessons in how European countries plan, deploy, and sustain a brigade-size rapid reaction force (China's deployments currently consist of only battalions and companies).

Chinese peacekeepers have also frequently interacted with counterparts from African and South Asian countries that provide the bulk of UN peacekeeping forces. These militaries, while less technologically advanced than the PLA, often have more experience handling militant groups. China's inexperience in this arena was evident in its poor handling of a July 2016 South Sudan attack, when some PLA peacekeepers reportedly abandoned their posts.[52] Cooperation with these militaries offers the PLA a chance to improve its own counterinsurgency and counterterrorism capabilities. For instance, a September 2018 drill involving Chinese and Nigerian forces in Mali focused on quickly responding to an attack on a UN camp. A Chinese participant reported that the two countries "learned from each other's operational concepts. The emergency response capabilities of Chinese peacekeepers have been further strengthened."[53]

Immersing in Foreign Societies

Chinese peacekeepers also learn how to operate in demanding circumstances alongside foreigners, a skill that cannot be easily replicated at home. One of the most concrete benefits is the chance to practice foreign language skills. PLA officers who serve in UN mission headquarters as staff officers or military experts typically arrive with some English, but working in these positions provides an

English immersion experience that they can parlay into later assignments, such as foreign area officers or intelligence analysts.[54] Contingent troops often learn at least simple English prior to deployments and have some opportunities to practice those skills (albeit sometimes assisted by portable translation software).[55] Members of China's standby peacekeeping units also study English as part of their training requirements.[56] These skills could help facilitate PLA operations anywhere English is widely spoken. In Mali, Chinese peacekeepers also have the chance to practice French, which could enable the PLA "to send future peacekeepers to any other French-speaking African country."[57]

Peacekeeping also requires PLA personnel to attain a level of cultural awareness necessary to operate among foreign populations. For many first-time deployers, who have limited if any foreign experience, this can present a unique challenge. One former PLA officer argued that the main benefits of deploying overseas are intangible: Participants become more "open-minded," referring to an ability to think outside their narrow perspectives and work more constructively with others.[58] Another interviewee stated,

> *At the operational level, the environment at home is quite different. In troublesome* [foreign] *regions we have to be alert, develop capabilities to engage local populations, develop situational and cultural awareness, and* [improve] *interoperability. Many jobs can be done in China but everything is pre-planned. It's different in a foreign environment.*[59]

Some information on foreign customs and other local conditions is presented to Chinese troops during their predeployment training.[60] In the field, Chinese personnel interact with host-country citizens (for example, as doctors treating patients or infantry troops guarding refugee camps) or with foreign peacekeepers and UN officials, which demands that they be able to overcome language and cultural barriers.

Operating at Risk

While Chinese troops have some exposure to difficult conditions at home, such as "combat-realistic" training and disaster relief operations, they are usually not confronted with deadly violence.[61] Participation in PKOs thus provides an opportunity for ground force personnel to operate at some risk.[62] This is most apparent in Mali and South Sudan, where Chinese peacekeepers have faced intermittent attacks or crossfire from insurgent groups.[63] As noted

previously, several Chinese infantry troops were killed in separate incidents in 2016. Other cases have been resolved without casualties. For instance, in January 2018, a PLA infantry squad patrolling outside the UN camp in Juba confronted militants who "aimed their guns at the Chinese peacekeepers" but, after negotiations with the Chinese commander, agreed to leave the area.[64] Dangers also abound in other missions. One example is mine-clearing in Lebanon, which, if not handled properly, could lead to fatal consequences.

From a force-building perspective, there are several advantages to placing Chinese troops in harm's way. First, as a senior PLA officer noted, China's lack of combat experience since 1979 means that the PLA needs to find other ways to "cultivate the idea of war" among future commanders, which is critical to improving China's "operational capabilities."[65] Peacekeeping is quite different from the more technologically sophisticated "informationized local wars" that the PLA is preparing to conduct in Asia, but it does give officers a chance to hone their leadership skills in dangerous and unscripted circumstances. Second are force protection lessons. In Mali, for instance, the PLA has needed to adopt "measures to improve protection of its soldiers and operations in a hostile environment while reevaluating its tolerance for risk."[66] Such lessons could be applied elsewhere, in or outside a UN context. Third, operating in dynamic situations gives officers and their troops "confidence and [a] sense of esprit de corps when missions are accomplished successfully."[67] As discussed below, however, risk aversion among Chinese troops could diminish these benefits.

Projecting Force

Regular PKO deployments also provide the PLA ground forces an opportunity to sharpen their ability to plan and conduct expeditionary operations. One aspect is that peacekeepers gain specific knowledge of the terrain, weather, transportation infrastructure, political and economic conditions, and cultures of the countries in which they are operating.[68] This knowledge is distributed across the ground forces through repeated deployments by personnel and in predeployment training programs. Successive years of experience in the same regions mean that, in the assessment of a former U.S. peacekeeper, "a ready force of African operational experts is being built—something the United States does not have."[69] While this insight is mostly

valuable for maintaining Chinese deployments in current PKOs, it could also enable future PLA operations in these countries in a different circumstance (such as counterterrorism operations).

Some lessons derived from managing PKOs may also be useful in other contexts. Deploying an infantry battalion, for instance, requires that planners think through problems such as long-distance transportation, morale and welfare, equipment repair and maintenance, food and fuel resupply, treatment and evacuation of wounded or sick personnel, predeployment training, officer and enlisted personnel selection, unit rotations, and other issues that would be relevant to deploying a similar unit in a different location. A senior Chinese interlocutor said that honing "joint command and control" skills among small units was a particular benefit of PKOs.[70] As Blasko noted, by assigning PKOs to all but one TC and multiple group armies, the PLA is ensuring that expeditionary planning skills are distributed across the ground forces.[71]

PKOs also provide PLA units with experience operating in a multinational and joint context. Most PLA overseas exercises are relatively brief, but peacekeeping requires Chinese troops to be able to work alongside other troop contributors for extended periods. Officers assigned to mission headquarters, for instance, have to understand the UN bureaucracy and be able to work effectively with colleagues from diverse backgrounds.[72] Moreover, while PLA peacekeepers are mostly drawn from the ground forces, there are a few apparent "joint" elements that require cooperation between the services. One example is coordination between the army and the air force, which manages long-range strategic airlift. Another is cooperation with the first PLA overseas base in Djibouti (managed by the navy), which likely serves as a logistics and transportation hub for PKOs as well as an evacuation point for overseas Chinese personnel.[73] Both types of experience could be valuable as China plans future coalition and joint operations.

Maintaining Readiness

PKO rotations serve as a "forcing function" for at least a small subset of the ground forces to build and maintain readiness, referring to the ability to quickly deploy at a high state of operational effectiveness.[74] Managing readiness begins during the predeployment training phase. Troops not only undergo language and cultural training, but also conduct simulations of some of

the worst-case situations they may encounter in the field. For instance, prior to deploying to Congo, Chinese peacekeepers at a training base in western China simulated a "fierce exchange of fires" with militants, using "warning shots" and other "military deterrence" measures to avoid an escalation.[75] Similarly, troops preparing to deploy to Lebanon practiced counterterrorism drills and "defended against enemy air raids and other emergencies."[76]

Efforts are also made to maintain readiness during the deployment phase. As noted above, this includes training conducted with other troop-contributing countries. It also includes periodic assessments by UN officials, who provide external validation of PLA equipment, training, and technical skills.[77] In March 2017, for instance, Chinese peacekeepers in Lebanon for the first time achieved "explosive ordnance disposal qualification" from the UN Mine Action Coordination Center. This demonstrated that Chinese troops have the ability to safely dispose of various ordnance, "including mortar shells, rockets, and aerial bombs."[78]

Some benefits to PLA ground force readiness also accrue from the creation of the peacekeeping standby force. This is illustrated in a PLA media report on the training regimen of a helicopter detachment assigned to the force. This unit, which has not been mobilized to participate in a PKO, has a "detailed" monthly training plan that consists of topics such as "security defense" [*anquan fangfan*, 安全防范], "self-help and mutual rescue" [*zijiu hujiu*, 自救互救], physical fitness, language proficiency, and cultural etiquette. The goal is to be "ready to deploy to a new mission area at any time."[79] PLA units registered in PCRS also benefit from external validation by UN inspectors, who assess factors that influence readiness.[80] Although no PLA unit has yet attained the UN's highest readiness level, the UN's force generation planning team has generally concluded that Chinese troops are "well trained, well equipped, and ready to be deployed without many caveats."[81]

Conclusion

China's participation in UN PKOs over the past 30 years means that some Chinese ground forces are increasingly well prepared to conduct smaller scale military operations far beyond the Indo-Pacific region. This does not imply an ability to conduct high-end wars against distant adversaries, but it does suggest a growing capacity to pursue military operations other than war (MOOTW), such as counterterrorism, humanitarian assistance/disaster relief,

and noncombatant evacuations.[82] Just as the PLA Navy has gained valuable noncombat experience in antipiracy patrols in the Gulf of Aden since 2008, the army has leveraged its role in PKOs to develop operationally relevant skills, build foreign language and cultural expertise, expose rising officers to real-world danger, learn how to plan and sustain distant operations, and enhance its ability to quickly respond to crises.[83] PKOs thus serve as a valuable adjunct to MOOTW training and operations conducted domestically.

The PLA expeditionary capabilities strengthened through participation in PKOs, and further developed as part of the peacekeeping standby force, could be useful in protecting China's expanding overseas economic interests.[84] Those interests include foreign infrastructure projects (many under the Belt and Road Initiative), overland energy shipment routes, access to raw materials and export markets, and the safety of Chinese citizens. Civil strife, regional disputes, and natural disasters pose risks to those interests, though the nature of the risk varies across countries. While Beijing has a variety of nonmilitary options to safeguard those interests, such as the use of private security companies, reliance on host-nation support, and civilian intelligence and law enforcement partnerships, PLA ground forces could be deployed in circumstances where risks are high and other options are unavailable.[85]

Beijing could call on operationally proficient and quickly deployable PLA Army units to protect China's material interests in future PKOs.[86] Decisions on where peacekeepers are deployed involve negotiations between the UN's Peacekeeping and Political Affairs departments, the UN Security Council, troop contributors, and the host nation. Relevant factors include mission requirements (for example, how many battalions of a specific type are needed), the geographic diversity of contributing countries, past performance records, and regional political sensitivities.[87] Beijing is in a strong position to influence deployment decisions for several reasons: its status as an extraregional actor (adding geographic diversity in places such as Africa or the Middle East); its relatively strong track record of performance in past PKOs;[88] the availability of a variety of capable units; its close economic relations with host states; its status as a UN Security Council permanent member; and its contributions to the UN peacekeeping budget.[89]

Beijing could lobby for approval of PKOs in areas where China's economic equities and citizens are concentrated, and then deploy PLA personnel

under the UN banner as a type of rapid reaction force to protect those interests (though in some cases China could rely on other troop-contributing countries). The virtue would be safeguarding China's interests while nominally adhering to the principle that military interventions need to be conducted with UN authorization. China's role in UNMISS provides a clue to how future missions could be tailored to achieve those goals. Beijing's primary interest in South Sudan is access to crude oil—China has agreed to acquire one-sixth of the country's oil output in return for infrastructure loans.[90] Given threats to oil production posed by civil conflict, China lobbied successfully for oil facilities to be included in the UNMISS mandate (over the objections of local opposition forces).[91] Beijing initially preferred to deploy PLA troops to guard oil fields, but ultimately agreed to send them to Juba, where they were most needed.[92] Future missions could entail a similar combination of UN mandates that Beijing tailors to suit its parochial interests and troop contributions designed to achieve those objectives. Rapidly deployable infantry battalions and specialized capabilities such as helicopters and counter–improvised explosive devices units offer Beijing a wider range of options to defend Chinese interests in a PKO framework.

Some skills acquired through UN peacekeeping experience could also apply to other operations involving deployed PLA ground forces. An evacuation of Chinese civilians from areas where PLA peacekeepers have operated, for instance, could benefit from a detailed knowledge of the local terrain, infrastructure, and political conditions. Lessons in planning and sustaining forces far from Chinese territory could be relevant to many types of MOOTW, such as humanitarian assistance/disaster relief. Previous interactions with foreign counterparts and UN staff in the peacekeeping arena could be useful in developing the language and intercultural skills needed to work in a multinational coalition. Even very different and more operationally challenging operations, such as counterterrorism strikes and raids, could benefit from the exposure to high-risk circumstances that PLA personnel gain in PKOs.

The operational value of China's peacekeeping experience in future scenarios, however, is limited by three constraints. First is the limited scale of the PLA's participation in PKOs. Despite distributing opportunities to 4 TCs and generating an 8,000-person peacekeeping standby force, the vast majority of the ground forces do not have, and are not preparing for, peacekeeping

responsibilities. Most army personnel instead remain focused on domestic missions or are preparing for "local wars" such as amphibious operations against Taiwan. This means the pool of highly qualified peacekeepers that could be called on in similar cases, and the opportunities for officers to gain practical "combat-like" experience, remains small (although this pool could expand if additional missions are authorized in the future). Moreover, the PLA has yet to deploy units above the battalion level. It is unclear whether the command, logistics, planning, and other requirements are in place to support a brigade-level or higher deployment.

Second is risk avoidance among PLA troops. The most prominent example was the July 2016 incident in which PLA peacekeepers were accused of leaving their posts and allowing militants to commit violent acts against UN aid workers in Juba.[93] Those accusations were substantiated by UN and international nongovernmental organization investigations.[94] Other foreign assessments suggest that PLA personnel in Mali, "while cultivating an image of strict discipline and professionalism," have rarely left their base and have had limited contact with the local population.[95] Whether based on casualty aversion, limited operational experience or capabilities, or the desire to minimize incidents that would harm the PLA's image within China and internationally, these examples suggest that the PLA could be depriving itself of some of the most valuable operational benefits of deploying (such as experiencing risk and working alongside foreigners).

Third are debates within China that could reduce Beijing's appetite for further deployments. On one hand, Chinese media glorifies the contributions of Chinese peacekeepers, with those killed in the line of duty treated as martyrs.[96] Chinese commentators thus suggest that the public is generally receptive to foreign risk-taking.[97] On the other hand, other Chinese interlocutors confide that some within the army are not particularly enthusiastic about PKOs, which are deemed a distraction from traditional combat missions and require that troops leave the comforts of home.[98] Tellingly, Beijing has also tolerated public dissent regarding China's role in PKOs, as illustrated in a *Beijing Review* article published after the fatal 2016 incident in Mali, which argued the following:

> *Currently, an urgent matter for China's policymakers should be assessing risks for peacekeepers in complex and varied environments. In consideration of geopolitical factors, religious conflicts and rampant terrorist activities,*

> *the Chinese Government should be more prudent before deciding whether or not to partake in such operations. . . . China should try to avoid sending peacekeepers to regions involved in conflicts between civilizations or being caught up in trans-regional or trans-national conflicts. The Chinese peacekeeping forces should also refrain from joining combat missions.*[99]

Hence, the PLA can derive valuable operational lessons from participation in complex future missions, including those that would involve combat troops, but achieving those benefits requires a political decision to intervene that cannot be taken for granted.

For comments on earlier drafts, the author thanks Scott W. Harold and Phillip C. Saunders.

Notes

[1] David Finkelstein coined the phrase *incipient expeditionary PLA*. See David M. Finkelstein, "Commentary on China's External Grand Strategy," paper presented at the Brookings Institution, July 14–15, 2009. For discussions of the PLA's growing expeditionary capabilities, see Timothy R. Heath, *Developments in China's Military Force Projection and Expeditionary Capabilities*, Testimony Before the U.S.-China Economic and Security Review Commission, January 21, 2016, available at <https://www.rand.org/pubs/testimonies/CT450.html>; and Kristen Gunness and Oriana Skylar Mastro, "A Global People's Liberation Army: Possibilities, Challenges, and Opportunities," *Asia Policy* 22 (2016), 131–156.

[2] *China's National Defense in the New Era* (Beijing: State Council Information Office, 2019), available at <http://www.xinhuanet.com/english/2019-07/24/c_138253389.htm>.

[3] See, for example, M. Taylor Fravel, "China's Attitude Toward UN Peacekeeping Operation Since 1989," *Asian Survey* 36, no. 11 (1996), 1102–1121; Bates Gill and James Reilly, "Sovereignty, Intervention, and Peacekeeping: The View from Beijing," *Survival* 42, no. 3 (2000), 41–59; Pang Zhongying, "China's Changing Attitude to UN Peacekeeping," *International Peacekeeping* 12, no. 1 (2005), 87–104; and Courtney J. Richardson, "A Responsible Power? China and the UN Peacekeeping Regime," *International Peacekeeping* 18, no. 3 (2011), 286–297.

[4] About 2,500 PLA peacekeepers are deployed at any given time, representing roughly 0.26 percent of the ground forces (based on the 2018 Institute for International Strategic Studies [IISS] estimate of 975,000). *The Military Balance* (London: IISS, 2018), 250.

[5] Joel Wuthnow, *Chinese Diplomacy and the UN Security Council* (New York: Routledge, 2013), 12–37; Samuel S. Kim, *China, the United Nations, and World Order* (Princeton, NJ: Princeton University Press, 1979), 178–241. As an example of limited proficiency, a former U.S. peacekeeper recounted that his Chinese counterparts in the early 2000s did not know how to drive. Phillipe D. Rogers, "China and United Nations Peacekeeping Operations in Africa," *Naval War College Review* 60, no. 2 (2007), 86.

[6] Miwa Hirono, "China's Charm Offensive and Peacekeeping: The Lessons of Cambodia—What Now for Sudan?" *International Peacekeeping* 18, no. 3 (2011), 328–343.

[7] Bates Gill and Chin-Hao Huang, *China's Expanding Role in Peacekeeping: Prospects and Policy Implications* (Stockholm: Stockholm International Peace Research Institute [SIPRI], 2009).

[8] However, China's contributions remained somewhat modest compared with the largest contributors. The number-one contributor in December 2018 (Ethiopia) contributed three times as many troops.

[9] Xi Jinping, "China Is Here for Peace," remarks to the UN Peacekeeping Summit, September 28, 2015, available at <https://www.fmprc.gov.cn/mfa_eng/wjdt_665385/zyjh_665391/t1302562.shtml>.

[10] Interview with a PLA officer, July 2019.

[11] UN, "Secretary-General Appoints Major General Wang Xiaojun of China Force Commander, United Nations Mission for Referendum in Western Sahara," December 8, 2016, available at <https://www.un.org/press/en/2016/sga1689.doc.htm>.

[12] Gill and Huang, *China's Expanding Role in Peacekeeping*, 9; Dennis J. Blasko, *The Chinese Army Today* (New York: Routledge, 2012), 221.

[13] This office, which was established in 2001, appears to have stayed in the Ministry of National Defense despite the 2016 reform of the Central Military Commission. See "China's Military Makes Important Contributions in Safeguarding World Peace" [中国军队为维护世界和平作出重要贡献], *Jiefangjun Bao* [解放军报], May 29, 2018, available at <http://www.mod.gov.cn/action/2018-05/29/content_4815455.htm>. For a discussion of the Joint Staff Department's role, see Chin-Hao Huang, "Contributor Profile: The People's Republic of China," *Providing for Peacekeeping*, April 27, 2017, 2–3.

[14] PKOs can include four levels of hospital. A Level 1 hospital provides "primary health care, emergency resuscitation, [and] stabilization and evacuation of casualties" but not more advanced capabilities. UN Department of Peacekeeping Operations, *Medical Support Manual for United Nations Peacekeeping Operations* (New York: UN Medical Support Unit, 1999), 20.

[15] "Chinese Peacekeepers to Darfur Complete UNAMID Super Camp Upgrading Project," *China Military Online* [中国军网], September 4, 2019, available at <http://eng.chinamil.com.cn/view/2019-09/04/content_9611462.htm>.

[16] "The 18th Chinese Peacekeeping Force to Lebanon Set Out," *China Military Online*, May 24, 2019, available at <http://eng.chinamil.com.cn/view/2019-05/24/content_9513433.htm>.

[17] "China Rotates Fourth Batch of Troops to UN Peacekeeping Operation in Mali" [中国赴马里维和部队进行第四次轮换], Xinhua, May 16, 2017, available at <http://www.gov.cn/xinwen/2017-05/16/content_5194454.htm>.

[18] "China First Overseas Peacekeeping Infantry Battalion Participates in UN Peacekeeping Operation" [中国首次向海外派遣维和步兵营参加联合国维和行动], *China Military Online*, December 22, 2014, available at <http://www.81.cn/syjdt/2014-12/22/content_6279709.htm>; "Last Batch of Chinese Peacekeeping Arrives in S. Sudan," *China Military Online*, April 9, 2015, available at <http://www.chinadaily.com.cn/world/2015-04/09/content_20036736.htm>. In November 2018, the battalion was transferred to a new UN "regional protection force" that will protect "key facilities" in Juba and the "main routes into and out of the city." Li Guigang, Zhu Xiaonan, and Liu Wenjun, "5th Peacekeeping Infantry Battalion to S. Sudan (Juba) Established," *China Military Online*, November 8, 2018, available at <http://english.chinamil.com.cn/view/2018-11/08/content_9338169.htm>; UN, "South Sudan: Deployment of UN-Mandated Regional Protection Force Begins," August 8, 2017, available at <https://news.un.org/en/story/2017/08/562962-south-sudan-deployment-un-mandated-regional-protection-force-begins>.

[19] Dennis J. Blasko, "The Biggest Loser in Chinese Military Reforms," in *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms*, ed. Phillip C. Saunders et al. (Washington, DC: NDU Press, 2019), 372.

[20] "Chinese Peacekeeper Among Four Killed in Mali Attacks," BBC, June 1, 2016, available at <https://www.bbc.com/news/world-africa-36424583>.

[21] Zhuang Pinghui, "Two Chinese UN Peacekeepers Killed, Two Seriously Injured in Attack on South Sudan," *South China Morning Post*, July 11, 2016, available at <https://www.scmp.com/news/china/diplomacy-defence/article/1988348/two-chinese-un-peacekeepers-killed-two-seriously>.

[22] Ma Yichong, "Chinese Peacekeeping Helicopters Complete Multi-Jet Transportation Task in Sudan," *China Military Online*, September 20, 2019, available at <http://eng.chinamil.com.cn/view/2019-09/20/content_9630187.htm>.

[23] Hao Zhaijian and Jiang Shuai, "China's 3rd Peacekeeping Helicopter Detachment to Darfur Sets Out," *China Military Online*, August 21, 2019, available at <http://eng.chinamil.com.cn/view/2019-08/21/content_9597189.htm>. This was not the only instance of Il-76s being used to transport Chinese peacekeepers. See, for example, "China Rotates 22nd Contingent of Peacekeepers to Congo" [中国赴刚果 (金) 维和部队进行第22次轮换], Xinhua, September 17, 2019, available at <http://www.xinhuanet.com/2019-09/17/c_1125005295.htm>.

[24] This is consistent with PKO management under the former military region system. See Blasko, *The Chinese Army Today*, 220.

[25] Ibid.

[26] The Eastern TC's predecessor, the Nanjing Military Region, likewise did not have a peacekeeping mission. One possible explanation is that ground forces in this theater are wholly focused on cross-strait operations.

[27] Michelle Nichols, "Countries Pledge 40,000 UN Peacekeepers at UN Summit," Reuters, September 28, 2015, available at <www.reuters.com/article/us-un-assembly-peacekeepers-idUSKCN0RS2E420150929>.

[28] Gill and Huang, *China's Expanding Role in Peacekeeping*, 4–6.

[29] *Peacekeeping Capability Readiness System (PCRS) Guidelines*, UN Department of Peace Operations, January 2019, 3.

[30] Ibid.

[31] Interview, UN official, October 2019.

[32] "China's Army Organizes 19-Unit Standby Peacekeeping Force," Xinhua, November 18, 2017, available at <http://www.xinhuanet.com//english/2017-11/18/c_136762780.htm>.

[33] China Ministry of National Defense, "Monthly Press Conference of the Ministry of National Defense on September 28," September 28, 2017, available at <http://eng.mod.gov.cn/focus/2017-09/28/content_4793398.htm>. The affiliation of some units is not known; for instance, the transportation and hospital units may belong to the Joint Logistic Support Force.

[34] "Forming the Peacekeeping Standby Force Battalion: 'China Red' Lifts Up 'Peace Blue'" [组建维和待命步兵: "中国红" 托举 "和平蓝"], *Jiefangjun Bao*, August 28, 2019, available at <http://military.cctv.com/2019/08/28/ARTIkUi8LTjccv1tKALpyo3L190828.shtml>.

[35] China Ministry of National Defense, "Monthly Press Conference of the Ministry of National Defense on September 28."

[36] Hong Xiao, "China Boosts Its Peacekeeping Role," *China Daily*, May 8, 2019, available at <http://www.chinadaily.com.cn/a/201905/08/WS5cd2f541a3104842260ba96f.html>.

[37] UN Peacekeeping Department, "Feature: Does Drone Technology Hold Promise for the UN?" September 6, 2017, available at <https://peacekeeping.un.org/en/feature-does-drone-technology-hold-promise-un>.

[38] *China's National Defense in the New Era.*

[39] Interview, UN official, October 2019. Although the readiness levels of units are considered confidential from the UN's perspective, China has opted to publicize improvements in readiness levels. If any PLA unit were elevated to the RDL, it is likely that it would be reported in Chinese media.

[40] Joachim A. Koops and Alexandra Novosseloff, "United Nations Rapid Reaction Mechanisms: Toward a Global Force on Standby?" *Contemporary Security Policy* 38, no. 3 (2017), 435. The other countries were Bangladesh, India, Nepal, Pakistan, and Sri Lanka.

[41] The English-language peacekeeping channel can be found at <http://eng.chinamil.com.cn/china-military/node_83425.htm>.

[42] Dennis J. Blasko, "China's Contribution to Peacekeeping Operations: Understanding the Numbers," *China Brief*, December 5, 2016, available at <https://jamestown.org/program/chinas-contribution-peacekeeping-operation-understanding-numbers/>.

[43] Military operations other than war, including peacekeeping, was included in the 2008 Outline of Military Training and Evaluation, which guided the formulation of PLA exercises. Leng Feng, *Toward the Transformation of PLA Military Training Under Conditions of Informationization* (Stockholm: Institute for Security & Development Policy, 2014), 24.

[44] *China Military Power* (Washington, DC: Defense Intelligence Agency, 2019), 61.

[45] For instance, the 2019 defense white paper notes that, since 2012, 950,000 active PLA personnel have participated in emergency response missions. *China's National Defense in the New Era.*

[46] *China's Growing Role in UN Peacekeeping* (New York: International Crisis Group, 2009), 14.

[47] Interview, retired PLA officer, July 2019.

[48] Rogers, "China and United Nations Peacekeeping Operations in Africa," 85–86.

[49] "Chinese and Foreign Peacekeepers Conduct Joint Mine Clearance and EOD Training in Lebanon," *China Military Online*, October 8, 2018, available at <http://english.chinamil.com.cn/view/2018-10/08/content_9305269.htm>.

[50] Jean-Pierre Cabestan, *China's Evolving Role as a UN Peacekeeper in Mali*, United States Institute of Peace (USIP) Special Report No. 432 (Washington, DC: USIP, September 2018), 4.

[51] Bo Zhou, "How China Can Improve UN Peacekeeping," *Foreign Affairs*, November 15, 2017, available at <https://www.foreignaffairs.com/articles/china/2017-11-15/how-china-can-improve-un-peacekeeping>.

[52] *Under Fire: The July 2016 Violence in Juba and UN Response* (Washington, DC: Center for Civilians in Conflict, 2016), 40–42; United Nations Security Council, "Letter Dated 1 November 2016 from the Secretary-General Addressed to the President of the Security Council," November 1, 2016.

[53] "Chinese and Nigerian Peacekeepers Conduct Joint Defense Drill in Mali," *China Military Online*, September 3, 2018, available at <http://english.chinamil.com.cn/view/2018-09/03/content_9271041.htm>.

[54] Interview, PLA officer, July 2019.

[55] "Armed for Peace, A 'Star of Peace' Shines on UN City" [一身戎装为和平, 闪耀在UN城的"维和之星"], *China Military Online*, January 4, 2018, available at <http://www.81.cn/lkkj/2018-01/04/content_7895810_6.htm>.

[56] "Peacekeeping Standby Force Battalion: 'To Safeguard World Peace, We're Ready to Move Out at Any Time'" [维和待命步兵营: "维护世界和平, 我们随时准备出征"], *Jiefangjun Bao*, September 3, 2019, available at <http://www.xinhuanet.com/mil/2019-09/03/c_1210264833.htm>.

[57] Cabestan, *China's Evolving Role as a UN Peacekeeper in Mali*, 5.

[58] Interview with a former PLA officer, July 2019.

[59] Interview with a Chinese scholar, July 2019.

[60] "Coming in Peace: China's 18th Engineering Detachment Sets Off for Lebanon" [为和平而来: 中国第十八批赴黎巴嫩维和建筑工兵分队出征], *China Military Online*, May 21, 2019, available at <http://photo.chinamil.com.cn/pla/2019-05/21/content_9508415.htm>.

[61] One exception is Xinjiang, but front-line troops are usually drawn from the People's Armed Police.

[62] *China's Growing Role in UN Peacekeeping*, 14.

[63] On China's participation in these two missions, see Courtney J. Fung, "Providing for Global Security: Implications of China's Combat Troop Deployment to UN Peacekeeping," *Global Governance* 25 (2019), 509–534.

[64] "Chinese Peacekeepers in S. Sudan Expel Armed Militants," *China Military Online,* January 8, 2018, available at <http://english.chinamil.com.cn/view/2018-01/08/content_7899534.htm>.

[65] Discussion with a senior PLA officer, August 2019. For details, see *Under Fire.*

[66] Cabestan, *China's Evolving Role as a UN Peacekeeper in Mali*, 4.

[67] Blasko, "China's Contribution to Peacekeeping Operations," 5.

[68] Gill and Huang, *China's Expanding Role in Peacekeeping*, 16.

[69] Rogers, "China and United Nations Peacekeeping Operations in Africa," 89.

[70] Discussion with a senior PLA officer, August 2019. It is not clear why he said "joint" in this context.

[71] Blasko, "China's Contribution to Peacekeeping Operations," 5.

[72] According to a PLA interviewee, the largest benefit in staffing a PKO in the mid-2000s was learning about how the UN bureaucracy functions. Interview, PLA officer, July 2019.

[73] Erica Downs, Jeffrey Becker, and Patrick deGategno, *China's Military Support Facility in Djibouti: The Economic and Security Dimensions of China's First Overseas Base* (Arlington, VA: CNA, 2017), 31.

[74] For context, the 2019 defense white paper stated that the Central Military Commission and TCs "conduct regular inspections and drills to ensure combat readiness at all times." The 2013 white paper revealed that the PLA categorizes readiness into three levels (I, II, and III) but provided no information about current distribution of readiness.

[75] "22nd Peacekeeping Detachment to Congo Organizes Simulated Camp Defense Exercises" [第二十二批赴刚 (金) 维和工兵分队组织模拟营区防卫演练], *People's Daily Online* [人民网], August 28, 2018, available at <http://military.people.com.cn/n1/2018/0830/c1011-30260908.html>.

[76] "Coming in Peace." For a discussion of similar training for MINUSMA personnel, see "China Rotates Fourth Batch of Troops to UN Peacekeeping Operation in Mali."

[77] "UNIFIL Headquarters Conducts First Security Evaluation for Chinese Peacekeeping Force," *China Military Online*, June 29, 2015, available at <http://eng.mod.gov.cn/Photos/2015-06/29/content_4592177.htm>.

[78] "Chinese Peacekeepers to Lebanon Obtain UN EOD Certification," *China Military Online*, March 7, 2017, available at <http://eng.mod.gov.cn/DefenseNews/2017-03/07/content_4774741.htm>.

[79] "China's Standby Peacekeeping Helicopter Team: Always Ready to Take Off for Peace" [中国维和待命直升机分队: 为和平起飞, 我们时刻准备着], *Jiefangjun Bao*, September 11, 2019, available at <http://www.81.cn/lkkj/2019-09/11/content_9618010.htm>.

[80] The specific requirements for achieving PCRS Level 2 readiness status are not clear. However, a standard checklist for assessment and advisory visits for police units provides some clues about the types of information UN inspectors evaluate. See "Check List for the AAV," available at <https://police.un.org/sites/default/files/fpu_sop_aav_annex_checklist.pdf>.

[81] Christoph Zürcher, *30 Years of Chinese Peacekeeping* (Ottowa: Centre for International Policy Studies, 2019), 56.

[82] It does not include combat missions such as strikes and raids, which are included in U.S. concepts of MOOTW. Academy of Military Science, Military Strategy Research Department, *Science of Strategy* [战略学] (Beijing: Military Science Press, 2013), 161; Fan Gaoyue and James Char, *Introduction to China's Military Operations Other than War* (Singapore: S. Rajaratnam School of International Studies, 2019).

[83] For an excellent analysis of the antipiracy patrols, see Andrew S. Erickson and Austin M. Strange, *Six Years at Sea . . . and Counting: Gulf of Aden Anti-Piracy and China's Maritime Commons Presence* (Washington, DC: Jamestown Foundation, 2015).

[84] Mathieu Duchâtel, Oliver Bräuner, and Zhou Hang, *Protecting China's Overseas Interests* (Stockholm: SIPRI, 2014).

[85] Joel Wuthnow, *Chinese Perspectives on the Belt and Road Initiative: Strategic Rationales, Risks, and Implications* (Washington, DC: NDU Press, 2017), 22–25; Timothy R. Heath, *China's Pursuit of Overseas Security* (Santa Monica, CA: RAND, 2018), 21–32.

[86] Courtney J. Fung, "What Explains China's Deployment to UN Peacekeeping Operations?" *International Relations of the Asia-Pacific* 16 (2016), 409–441.

[87] Interview with UN official, October 2019.

[88] China's track record, however, is not perfect. For instance, the Chinese commander was criticized for his handling of the July 2016 incident in Juba that left two Chinese peacekeepers dead.

[89] In 2019, China contributed 15.21 percent of the peacekeeping budget, behind only the United States (27.89 percent). See "How We Are Funded," available at <https://peacekeeping.un.org/en/how-we-are-funded>. Beijing has not, however, been able to acquire a top spot in the UN peacekeeping bureaucracy, as some media reports have indicated is its goal. Colum Lynch, "China Eyes Ending Western Grip on Top UN Jobs with Greater Control over Blue Helmets," *Foreign Policy*, October 2, 2016, available at <https://foreignpolicy.com/2016/10/02/china-eyes-ending-western-grip-on-top-u-n-jobs-with-greater-control-over-blue-helmets/>. As of early 2020, the top UN peacekeeping official is French. Moreover, despite a reported attempt by Russia to claim the top spot in the Department of Political and Peacebuilding Affairs, that job remains in American hands.

[90] Okech Francis, "China Gets a Sixth of South Sudan Oil Output to Build Highways," Bloomberg, April 5, 2019, available at <www.bloomberg.com/news/articles/2019-04-05/china-gets-a-sixth-of-south-sudan-oil-output-to-build-highways>.

[91] Lucy Poni, "South Sudan Opposition Against UNMISS Guarding Oil Facilities," VOA News, May 29, 2014, available at <www.voanews.com/africa/south-sudan-opposition-against-unmiss-guarding-oil-facilities>.

[92] Colum Lynch, "U.N. Peacekeepers to Protect China's Oil Interests in South Sudan," *Foreign Policy*, June 26, 2014, available at <https://foreignpolicy.com/2014/06/16/u-n-peacekeepers-to-protect-chinas-oil-interests-in-south-sudan>.

[93] Interview, Western diplomat, August 2019, 56.

[94] *Under Fire*; United Nations Security Council, "Letter Dated 1 November 2016 from the Secretary-General Addressed to the President of the Security Council." Beijing, however, denied the allegations and claimed that troops continued to "implement the mandate of UNMISS while rescuing wounded soldiers." "China Rejects Allegations Its UN Peacekeepers Abandoned Posts in South Sudan After Attack," *South China Morning Post*, October 11, 2016, available at <www.scmp.com/news/china/diplomacy-defence/article/2026975/china-rejects-allegations-its-un-peacekeepers-abandoned>.

[95] Cabestan, *China's Evolving Role as a UN Peacekeeper in Mali*, 4.

[96] Ibid., 6.

[97] Interview with a retired PLA officer, July 2019.

[98] Interviews with Chinese academics and PLA officers, 2018–2019.

[99] Ma Xiaolin, "The Human Cost of Peacekeeping," *Beijing Review*, June 23, 2016, available at <http://www.bjreview.com/Opinion/201606/t20160614_800059353.html>

CHAPTER 10

China's Security Assistance in Global Competition

By Jonah Victor

The People's Liberation Army (PLA) is increasing its presence abroad through a growing role in China's international security assistance and cooperation programs. In July 2019, China's State Council published a new white paper on defense policy, which asserted that "international strategic competition is on the rise" and that the PLA has a mission to protect the "security and interests of overseas Chinese people, organizations and institutions."[1] Furthermore, the PLA will "actively promote" international security and military cooperation and relevant mechanisms for protecting China's overseas interests. This includes strengthening military cooperation with developing countries in Africa, Latin America, the Caribbean, and the South Pacific, including personnel training, officer exchanges, and assistance toward military development and defense capabilities. The white paper argues that such activity is consistent with "mutual trust, mutual benefit, and win-win cooperation."[2]

China's overseas security assistance is not new. From the founding of the People's Republic in 1949, China offered military cooperation and assistance to socialist countries and newly independent states.[3] In a 1964 speech in Ghana, Premier Zhou Enlai explained that China's foreign assistance would

adhere to "Eight Principles," including mutual benefit, no conditions, and nondependency.[4] In subsequent years, China aimed to diplomatically supplant Western influence in Asia and counter Soviet influence globally. This endeavor entailed Chinese aid for liberation movements, including those in Angola and Zimbabwe.[5] Beijing's global campaign of security assistance subsided somewhat in the 1980s and 1990s before resurging in the 2000s and even more so in the 2010s.

China's current approach to security assistance echoes past activities to a certain extent, even as the scope and scale of those efforts have become bigger than ever in some respects. In 2019, Beijing claimed to have 54 defense consultation and dialogue mechanisms with 41 countries and international organizations.[6] This aspect of the PLA's growing global role is likely to increasingly compete with the security cooperation activities of other major powers. The interesting question is how security cooperation programs fit into Beijing's view of an increasingly competitive international space. Is China quantitatively focusing global security assistance and cooperation activities to support a competitive foreign policy strategy, and is its security assistance indeed qualitatively competitive—on a par with or better than what is on offer from other major powers?

China's relations with African states offer a useful lens through which to answer those questions, given the relative political and legal flexibility in Beijing's Africa policy. Unlike in Asia, China does not face in Africa direct security threats that would shape its priorities or have territorial disputes that would limit its potential partners.[7] China's military engagement in Africa does not contend with the arms embargo of the European Union or the careful balancing of relations in the Middle East between Iran and its rivals. Beijing has presented a broad regional policy for Africa and backed it with a continent-wide diplomatic campaign.[8] Several other major powers are likewise offering security assistance to African countries; they too have largely arm's-length relationships with them. In addition, with 53 countries on the continent, many potential diplomatic interactions and opportunities for major power competition exist, offering a good sample size of data.[9]

Through the lens of the African case, this chapter argues that China's global security assistance is increasingly aligned with its objective of becoming a global power and its pursuit of global economic access. In Africa, China's role as a security partner and provider is growing and could even

dominate in niche areas that concern equipment, infrastructure, and financing. Nevertheless, it is unlikely that Chinese assistance will fully substitute for that provided by Western and other countries over the next several years, given current PLA capabilities and Beijing's avoidance of direct involvement in Africa's conflicts outside of a United Nations (UN) mandate.

The chapter proceeds in five main sections. The first discusses China's global approach to international security assistance and the PLA's role. The second gives an overview of five categories of Chinese security assistance and cooperation most important to China's foreign engagement. The third analyzes China's goals for engagement and cooperation with African countries. The fourth conducts a statistical analysis to validate assumptions about the drivers of China's security engagement in Africa. The fifth identifies the kinds of security assistance Africans are seeking and examines how well Beijing can meet African needs in light of competition from other major powers. The conclusion offers implications for China's security assistance approach in the coming years.

China's Security Assistance as Foreign Policy

Just 2 months after releasing the defense white paper in 2019, Beijing published a white paper on foreign policy that stated its diplomatic goals of expanding global trade and investment to boost China's development, promoting world peace and stability, contributing to global development and prosperity, and promoting a multilateral global system.[10] Although the two white papers included overlapping themes, there is still some question as to whether Beijing's plans for international security assistance programs and foreign military engagements are consistent with, and supportive of, China's overall foreign policy objectives.

Such policy coordination would seem to be obvious for an observer who is familiar with U.S. security assistance programs, in which regular coordination occurs between the State Department, the Department of Defense, the White House, Congress, and other agencies. Such coordination is less clearly observable in China, where defense policy and control of the PLA is centralized not under the State Council (which also oversees the Ministry of Foreign Affairs) and the Ministry of National Defense, but in the Chinese Communist Party's (CCP's) Central Military Commission. Moreover, some important security assistance functions, including arms and equipment sales and

advisory support, are implemented outside the government by state-owned enterprises and private firms such as NORINCO and Huawei.

Scholars have debated the extent to which China's foreign civilian and military programs are synchronized. Michael Swaine asserts that the PLA is an implementer of China's foreign policy strategy, which is set by the CCP. The PLA's mandate "is almost exclusively defined by its professional responsibilities," but its coordination with Chinese diplomacy is "virtually non-existent."[11] By contrast, Timothy Heath claims that the Ministry of Foreign Affairs "likely collaborates" with the military's senior leadership to develop plans for security assistance, particularly in countries featuring major Chinese investments. He suggests that some evolution has occurred: Whereas previously Beijing was primarily motivated to sell arms and equipment to generate income for the defense industry, sales now are more strategically targeted, with policy considerations sometimes favored over profit motives.[12]

These policy considerations include regional and country-specific objectives, as well as larger global aspirations. In the past, China's security assistance focused on propping up friendly regimes in countries such as Cambodia. More recently, PLA engagements have transitioned to a general "charm offensive" in an effort to improve state-to-state relations.[13] This objective is apparent both close to home—despite contentious territorial issues between China and several of its Southeast Asian neighbors—and farther afield.[14] According to Kenneth Allen, Phillip C. Saunders, and John Chen, the PLA's foreign engagements are also likely intended to shape China's security environment, collect intelligence on foreign partners, and learn from advanced militaries.[15]

Western and Chinese scholars likewise generally agree that China's security assistance is part of a broader effort to create a favorable international image for China and support its overall diplomacy.[16] Since its introduction in 2013, the Belt and Road Initiative (BRI) has been China's overarching global engagement effort and the signature foreign policy initiative of Xi Jinping. Unlike the foreign policy white paper, the defense white paper does not specifically mention the BRI, but it does hint at the role the PLA can play in safeguarding "overseas interests," including citizens abroad and sea lines of communication. The defense white paper asserts that PLA forces will "fulfill their international responsibilities and obligations, and provide more public security goods to the international community." This continues an effort to

increase China's global prestige and to position the PLA as a "world-class" military, a goal Beijing hopes to attain by midcentury, including through increasing the PLA's experience operating abroad.[17]

How China Offers Security Assistance

Chinese security assistance is carried out through a variety of programs and activities. This section gives an overview of Chinese assistance in five areas that are particularly important in China's foreign engagements. Three are largely implemented by the PLA: professional military education, exercises and tactical training, and counterterrorism cooperation. Two are largely implemented outside the PLA but are integrated in China's offers of security cooperation: arms sales and surveillance system sales.

Professional Military Education

According to PLA Major Generals Wang Jinlong and Jiang Qianming, professional military education (PME) is a priority for China's security assistance efforts under Xi. They state that offering PME courses to international students enables the PLA to learn about the latest developments in military science and technology, enhances the PLA's international influence, and makes Chinese military education more competitive with that offered by other countries.[18] The 2019 defense white paper claims that more than 20 Chinese military education institutions offer exchanges with more than 40 countries. It further boasts that, to date, more than 10,000 foreign personnel from 130 countries have studied in Chinese military universities and colleges.[19] One Chinese PME brochure lists Isaias Afwerki, current president of Eritrea, and former leaders such as Robert Mugabe of Zimbabwe and Joseph Kabila of the Democratic Republic of Congo (DRC) among its alumni.[20] Courses are offered in Chinese, English, French, Russian, and Spanish, which suggests particular attention to attracting students from Africa and Latin America.

The International College of Defense Studies at the PLA National Defense University (NDU) is China's largest institution that offers graduate-level PME for international students. According to John Van Oudenaren and Benjamin Fisher, foreign students are segregated from the PLA students attending NDU and are exposed to a highly ideological curriculum emphasizing post-colonial grievances against the West and promotion of the Chinese

political-economic system as an alternative to the Western liberal model of governance.[21] Ideological messaging is less a quirk than a central feature of Chinese PME: Generals Wang and Jiang, administrators themselves of a PLA university, state that "[ideological and] political construction is the lifeblood of the development of military academies."[22] According to the college's Web site, all programs for foreign officers include "China Studies."[23]

Exercises and Tactical Training

PLA forces also carry out an array of bilateral and multilateral exercises with various foreign partners. Allen, Saunders, and Chen find that the PLA's combined exercises increased substantially across functions and PLA services in the 2010s. They judge that international exercises offer the PLA the chance to learn new skills, take stock of PLA capabilities, demonstrate PLA capabilities to the wider world, and in some cases build partner capacity.[24] Van Oudenaren and Fisher state that bilateral and multilateral exercises help PLA personnel gain operational experience to compensate for a lack of actual combat opportunities.[25]

The PLA has gone from averaging fewer than 10 of these events each year in the early 2000s to dozens each year since 2014, reaching 60 by 2018, according to the U.S. National Defense University's (NDU's) China Military Diplomacy Database.[26] These exercises are incrementally expanding in scope, scale, and sophistication. Recent international exercises have focused on antipiracy, counterterrorism, humanitarian assistance and disaster relief, peacekeeping, and combat support. The PLA's tactical training of foreign troops, beyond PME and ad hoc exercises, is less advertised than other activities and probably is quite infrequent. One explanation is that the PLA lacks combat experience that would make for a strong selling point for partner countries.

Counterterrorism Cooperation

China's experience in counterterrorism (CT) has been growing, but its activities abroad are quite different from its approach at home. Domestically, China launched its national "counterterrorism" campaign in 2014 following the bombings in Urumqi, Xinjiang Uighur Autonomous Region. Beijing's approach to Xinjiang and potential Uighur militancy and terrorism has a heavy antiterrorism element to include managing Muslim religious affairs, attempting to integrate Uighur and Han populations, and conducting

ideological campaigns. Operationally, Beijing deployed the People's Armed Police in Xinjiang, led extensive patrols, set up traditional and advanced surveillance systems to include artificial intelligence facial scanners, and recruited networks of informants.[27]

However, it is not clear that much of this experience is relevant to assisting other regions and countries afflicted with terrorism. Beijing has been willing to mediate, as between Kabul and the Taliban in Afghanistan, but has been reluctant to become heavily involved in actual CT operations.[28] In addition, even though China has marketed armed drones to foreign customers for pursuing terrorist targets, the PLA at home uses unmanned aerial vehicles (UAVs) only for surveillance and is not reported to have used armed drones in real-world operations.[29]

Within these confines, China has increased CT cooperation with other countries in recent years. For instance, in 2016, the PLA claimed to have conducted with Pakistani "commandos" tactical counterterrorism exercises that included mountain and urban terrain, close combat skills, weapons operation, reconnaissance, search and capture, and explosive ordnance disposal.[30] People's Armed Police personnel are reportedly forward based in Tajikistan, where they conduct patrols, even as Chinese officials deny any "military" intervention.[31] China supports strengthening the CT capabilities of the multinational Shanghai Cooperation Organization (SCO) and has participated in many purported CT exercises, but SCO member states have divergent views of terrorist threats, which ultimately has limited any substantive cooperation.[32]

Arms Sales

China has long been a major global exporter of arms that are traditionally known more for their attractive price than for their quality and sophistication. Between 2014 and 2018, China was the world's fifth-largest arms exporter, accounting for 5.2 percent of all global arms sales dollars.[33] While this amount actually represented a slight decrease in market share from the prior 4 years, the 2000s and 2010s saw a dramatic increase in Chinese arms sales overall: The 2009–2013 period had 195 percent more sales than did the 2004–2008 period. Beijing boasts that Chinese equipment is an excellent value, offered at "the most flexible payment terms" of any major exporters and without the "political barriers" of the United States and other countries.[34]

China's reputation as a leading source of low-end equipment is changing. In the past several years, China has become the largest exporter of armed UAVs and increasingly offers such big-ticket items as fourth-generation fighter jets, antiship cruise missiles, large surface combatants, and submarines.[35] Some analysts argue that China's arms sales are becoming part of Beijing's competitive foreign policy. The 1998 restructuring of the Chinese defense industry removed the PLA from a direct role in supervising defense firms and gave the state and the CCP greater influence over foreign military sales.[36] This was a shift from the 1980s and 1990s, when the PLA relied on defense industry sales for funding. While currently dependent on just three customers—Algeria, Bangladesh, and Pakistan—for 64 percent of sales, China has found dozens of buyers across Africa, Asia, Latin America, and the Middle East.[37] According to Michael Raska and Richard Bitzinger, China fills a particular niche with customers that are either too poor to buy Western or Russian armaments or have been subjected to Western arms embargoes.[38]

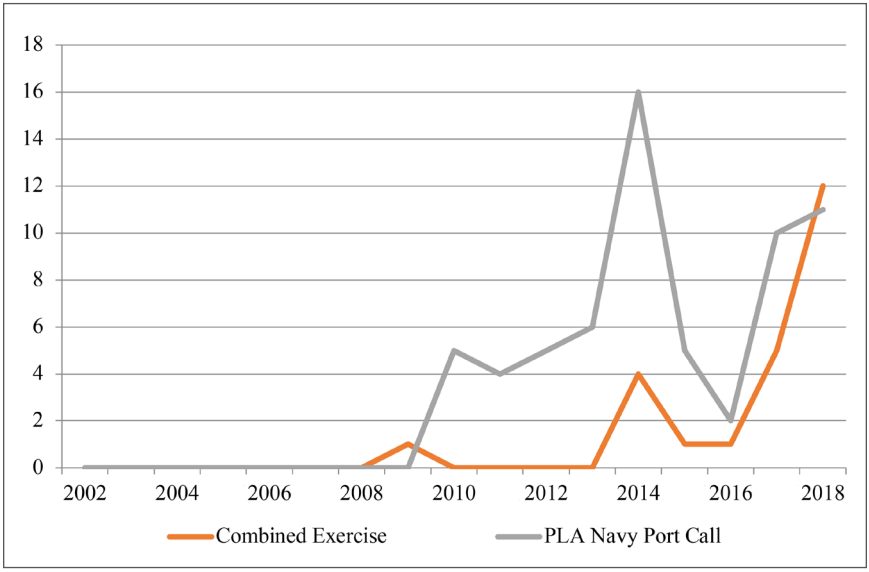
Surveillance System Sales

Sales of surveillance systems, while distinct from traditional arms sales, are an increasingly important component of Chinese security assistance. Chinese firms offer extensive municipal and online surveillance systems at more affordable prices than Western firms do.[39] The most well-known "Smart City" security packages come as "Safe City" and "U-Safety" systems, marketed by private firms Huawei and ZTE, respectively. A Safe City might include extensive closed-circuit television systems, command centers, data-processing centers, and even drones and aerostatic balloons. These systems can address public safety issues within cities and be used for counterterrorism purposes. Although these firms are ostensibly private, their international presence has benefited from substantial Chinese government support. According to Artigas Alvaro, for instance, Huawei's marketing was enabled by billions of dollars in credit from the China Development Bank and the China Export-Import Bank, as well as by Beijing's diplomatic efforts.[40]

China's Competitive Policy for Africa

China's observable military presence and activities in Africa have grown significantly in the 2010s (see figure 1). For instance, the PLA deployed its first infantry

Figure 1. PLA International Engagements in Africa (2002–2018)



Source: NDU Chinese Military Diplomacy Database.

battalion to Africa in 2014 to the UN peacekeeping operation in South Sudan, established its first overseas base—in Djibouti—in 2017, and held 21 combined exercises in Africa between 2014 and 2018 (though it had engaged in a few before that period as well). Moreover, the PLA Navy averaged nearly nine port calls per year in Africa from 2014 to 2018, a notable increase from previous years.[41]

These trends reflect a number of political, economic, and strategic motives. In official policy documents, Beijing has explicitly defined its foreign policy goals in Africa and its view of the significance of security engagement. China's 2015 white paper on Africa policy highlights Beijing's emphasis on cooperation in the areas of economic development, trade, and investment. It also describes Beijing's intent to play a role in "maintaining and promoting peace and security in Africa," to support the development of the African Union Standby Force, and to boost military exchanges, cooperation, and joint training. The document states that this engagement intends to strengthen the defense, stability, and CT capabilities of African countries individually and as a collective.[42] These objectives were expanded on at the triennial Forum on China-Africa Cooperation (FOCAC) summit in 2018. Beijing's FOCAC "Action Plan" reiterates the 2015

objectives and speaks additionally of strengthening intelligence cooperation and helping African countries build "smart cities" to enhance the role of information technology in public safety and CT.[43]

In contrast to the lofty rhetoric contained in official documents, Chinese officials and government-connected scholars note that Chinese security assistance has fairly parochial objectives that advance specific national interests. In 2019, senior Chinese diplomat Dai Bing described PLA deployments to peacekeeping operations as "a good exercise opportunity for our army."[44] Wang Lei of the state-sponsored China Institutes of Contemporary International Relations wrote in 2018 that "China's focus on Africa's security sector is mainly to support [our] overseas interests" and contrasted Beijing's approach with Washington's "broader focus" on African security and the more direct involvement of U.S. forces in African CT operations.[45] Scholars at China's NDU asserted in 2018 that China's security assistance to Africa will help win the political and diplomatic support of African countries, protect Chinese citizens and economic interests in Africa, demonstrate China's role as a responsible great power, and present an alternative to the Western approach.[46]

There is also a plausible linkage between China's economic goals and its security engagement in Africa. China's principal economic objectives in Africa include both promoting its exports for African markets and securing access to raw commodities needed for China's domestic economy and manufacturers.[47] Beijing's bundling of trade, investment, and aid in comprehensive packages has been a distinguishing characteristic of China's outreach to Africa.[48]

Determining the extent to which China's security assistance reflects a desire to compete with the United States and its allies in Africa requires a more nuanced discussion. Most analysis of U.S.-China competition in Africa has focused on the economic and political sectors. Although some analysts, such as Larry Hanauer and Lyle Morris, question the extent to which U.S. and Chinese firms compete head to head, Aubrey Hruby observes that China is increasing foreign direct investment, private equity, and venture capital—traditional areas of U.S. strength.[49] Moreover, official statements from Beijing and Washington indicate that the intent to compete in trade and investment in Africa has become official policy. Beijing touts the BRI as a new platform for global cooperation and asserts that China can offer an alternative to the

Western development model, while Washington presents development finance programs as a competitive response to the BRI.[50]

David Shinn argues that Chinese and U.S. interests in Africa most often conflict in politics, with Washington typically using its leverage to promote human rights and democracy and Beijing favoring a no-strings-attached approach to maintaining good relations with all African governments.[51] Isolating Taiwan has been an important political objective, although at the time of writing Eswatini was the only remaining African country that maintained official relations with Taipei. By some accounts, Burkina Faso broke ties with Taiwan in 2018 after facing pressure by its neighbors in the Sahel region. Beijing refused to offer financial support to the Sahel Group of Five CT coalition as long as a single member—Burkina Faso—recognized Taiwan.[52]

Less evident than the competing economic and political interests is whether China is in a concerted struggle for security partnerships. In 2009, Jonathan Holslag wrote, "There is no evidence that China's military aid [in Africa] successfully counterbalances other powers, such as the United States. . . . Chinese military presence is negligible."[53] Even more recently, a scholar at a state-sponsored Beijing think tank and a senior PLA officer noted the critical security role that the United States and Europe play in Africa on issues such as terrorism, and professed China's desire to cooperate with those providers rather than replace them.[54] Further, Chinese diplomats and policy papers state an explicit preference for contributing to security efforts in Africa through the UN system and peacekeeping missions.[55]

Nevertheless, a perception has advanced in both Western capitals and Beijing that a security competition is emerging in Africa. In 2019, the commander of U.S. Africa Command stated that the expansion of the BRI "is further enhancing China's influence while challenging our own partnerships in Africa."[56] That same year, the chief of the British military's defense cooperation mission for Africa stated, "Whilst clearly we are in competition with China, for many African nations we are still the partner of choice."[57] Shen Zhixiong, a Beijing-based scholar, acknowledged the U.S. military's "tremendous" public diplomacy effort in Africa and observes that "fierce" competition with the West compels China to "combine development policy with security policy."[58] Zhang Hongming of the state-sponsored China Academy of Social Sciences contended that China is winning the "strategic initiative" [*zhanlüe zhudong*,

战略主动] in a "new game" [*xin yilun boyi*, 新一轮博弈] in Africa among the major powers, but stated that competition between the United States and China is more linked to a deterioration of overall U.S.-China relations than based on issues specific to Africa.[59] In sum, China's security assistance activities in Africa appear to fit within an overall Africa strategy, driven in part by the recognition that China needs to be competitive as a security partner even without attempting to replace the Western role on the continent.

Quantitative Analysis of the Drivers of Military Engagement

The foregoing discussion reviewed official and academic claims about China's security assistance strategy in Africa, but we lack a rigorous empirical analysis of how political, economic, and security considerations drive China's military outreach efforts. Absent from this discourse are rigorous quantitative tests of several derived propositions about China's military engagement efforts:

- First, China's military engagement is aligned with Beijing's overall diplomatic objectives for strengthening bilateral relationships and expanding influence among foreign populations
- Second, China's military engagement supports China's economic interests in securing imports of African commodities and opening major African markets to Chinese exports, including arms
- Third, China's military engagement prioritizes developing relationships with Africa's largest militaries to increase global security influence.

This section tests those propositions through a multivariate data analysis. Although China does not release official security assistance data, this analysis benefits from a new data set on Chinese military diplomacy published by the U.S. NDU's Center for the Study of Chinese Military Affairs. It records specific *military diplomacy events* conducted by the PLA worldwide, including senior-level visits by PLA officers, PLA Navy port calls, and PLA bilateral or multilateral exercises, which are often publicized in official Chinese media. These events, albeit an imperfect proxy for the full scope of foreign security engagement, can indicate where China is focusing its efforts to deepen ties with African militaries. This analysis will use a count of *military diplomacy events* that the PLA has executed with each African country to represent China's level of effort at bilateral military engagement.

In explaining the number of *military diplomacy events* that China conducts with each country, this study considers several independent variables for the period from 2008 to 2018 across 53 African countries. The first variable captures China's overall objective with regard to the strength of each bilateral political relationship. Allen, Saunders, and Chen, as well as Bill Bishop, have surmised that Beijing gives a name to each bilateral relationship that indicates its intended priorities, from a relatively lukewarm "cooperative partnership" to stronger "strategic partnership" to "comprehensive strategic partnership."[60] Allen and colleagues find a statistically significant relationship between military diplomacy and level of partnership, based on a worldwide data set (albeit one that does not include any control variables). Thus, I coded a variable for *diplomatic relationship,* which is a score from zero to three based on the number of key words (*comprehensive*, *strategic*, and *partnership*) that Beijing uses to describe its relationship with each African country.[61]

The second variable is *population* of African countries, positing that, in line with its aspirations for global political influence, China will prioritize influence with the largest countries.[62] The third variable is the value of *arms exports* to each African country, positing that military engagement complements and supports China's effort to expand the market for Chinese arms.[63] The fourth and fifth variables are China's *exports to* and *imports from* each African country, positing that China's military engagement supports and complements Chinese economic engagement objectives to secure raw material imports and expand export markets, including through the BRI.[64] The sixth variable is the *military size* for each African country, positing that China will prioritize engagement with the largest militaries to strengthen its security influence abroad.[65]

Table 1 shows estimates for multivariate models. The variables are analyzed using a single-panel Poisson regression across 53 African countries for the cumulative count of *military diplomacy events* from 2008 to 2018.[66] The average African country engaged in 4.25 military diplomacy events with China during this period. Twelve countries engaged in zero events. Djibouti, among the smallest African countries, engaged in the highest number—34 events, most of which were port calls related to the PLA Navy's participation in antipiracy operations in the Gulf of Aden. Djibouti would seem to be an outlier case, so the analysis estimates models with and without it.

Table 1. Poisson Model of China's Military Diplomatic Events in Africa (2008–2018)

	Model A (all countries)	**Model B** (excluding Djibouti)	**Model C** (excluding Djibouti)	**Model D** (excluding Djibouti)
Diplomatic Relationship	0.3190 ***	0.1845 **	0.0550	0.1232
	(0.0680)	(0.0783)	(0.0783)	(0.0783)
Population of Country (millions)	0.0087 ***	0.0150 ***	0.0049 **	
	(0.0033)	(0.0035)	(0.0023)	
Chinese Arms Exports (millions USD)	0.0016 ***	0.0024 ***	0.0011 ***	0.0014 ***
	(0.0005)	(0.0005)	(0.0004)	(0.0004)
Other Chinese Exports (millions USD)	–5.85E-06	–5.24E-05	2.04E-05	5.87E-05 **
	(3.26E-05)	(3.25E-05)	(2.74E-05)	(2.40E-05)
Chinese Imports (millions USD)	5.30E-05 ***	8.70E-05 ***	5.14E-05 ***	4.32E-05 ***
	(1.55E-05)	(1.55E-05)	(1.25E-05)	(1.32E-05)
Size of Military (thousands of troops)	–0.0102 ***	–0.0119 ***		–0.0038 **
	(0.0026)	(0.0031)		(0.0019)
constant	0.95 ***	0.77 ***	0.78 ***	0.91 ***
	(0.11)	(0.12)	(0.12)	(0.11)
Pseudo R2	0.21	0.29	0.23	0.23
N (number of countries)	53	52	52	52

*** p < .01 ** p < .05 * p < .1 (two-tailed test)

Models A and B, which include all variables, obtain substantively similar results, with and without including Djibouti, respectively. As expected, *diplomatic relationship*, *population*, *arms exports*, and *imports* each have statistically significant and positive relationships with the number of *military diplomacy events* for each country. *Other exports* is not found to be statistically significant, and *military size* is counterintuitively found to have a statistically significant and negative relationship with *military diplomacy events*,

suggesting that China prioritizes engagement with smaller foreign militaries. The *R*-squared is higher for the estimations without Djibouti, suggesting a better model fit and more credible results when the outlier country is removed.

Models C and D exclude *military size* and *population*, respectively. Those variables have a moderate correlation of 0.51 with each other. The results are substantively the same as those of the first two models with the exception of *diplomatic relationship*, which loses statistical significance, and *other exports*, which is positive and significant in model D when population is excluded. *Other exports* and *population* have a high correlation of 0.69, so while population size seems to be an important factor for China's prioritization of military diplomacy, it is difficult to know how much of this is related to Beijing's considerations about the size of a market for Chinese goods rather than the size of foreign populations to be influenced.

Overall, the data analysis finds that the PLA is more likely to engage with African countries that are diplomatic priorities for Beijing, have larger populations, are important sources for China's commodity imports, and are customers for Chinese arms exports. At the same time, the analysis indicates that China's military outreach does not prioritize relations with larger militaries, which fails to offer support to the claim that security influence is a driver of engagement. Also, while *arms exports* factors into the number of *military diplomacy events*, a weak bivariate correlation of 0.17 calls into question the extent to which China's military diplomacy is closely coordinated with arms sales. Taken together, this finding is evidence of a political-economic–driven approach to the PLA's international outreach in Africa.

However, quantitative measures of interaction do not indicate the quality of security cooperation and assistance, and international partnership requires agency and decisions on both sides. The next section will look at what Africans might be looking for in security assistance and what China and other states are able to qualitatively provide.

African Security Requirements—and What Is on Offer

African countries face a wide variety of security threats and related requirements and enjoy access to an increasing number of security cooperation partners. Giles Mohan and Ben Lampert remind us that Africans have agency even in the midst of great power competition and that "African actors have

been able to shape [great power] relationships in ways that advance their own interests and aspirations."[67]

North African countries face threats from the continuing internal conflict in Libya as well as flows of irregular migrants and trafficking of illicit goods from south of the Sahara. East African countries cope with continuing conflict in Somalia and South Sudan, terrorism, wildlife poaching, and piracy. West Africa faces terrorism, banditry, maritime crime (including illicit fishing and oil smuggling), and persisting conflict in the Sahel region, particularly in Mali and northern Nigeria. Central Africa competes with ongoing conflict and insurgency in several countries, while Southern Africa contends with wildlife poaching and acute levels of crime in South Africa. Muslim extremist groups, mostly linked to al Qaeda or the so-called Islamic State, continue to threaten governments and civilians in many states in East, North, and West Africa, and are emerging as a threat in Central and Southern Africa. States across Africa also face occasional popular unrest and violence, often surrounding elections.[68]

Various African military and police forces suffer from deficiencies that include inadequate training, professionalization, equipment, logistics, human capital, and sustainment. Some forces are quite corrupt, commit gross violations of human rights, and challenge civilian governance. Nonetheless, aside from occasional intervention and direct action by the UN and external forces, African military and police forces usually play a decisive role in shaping the security environment on the continent.[69]

Although Chinese military assistance to African militaries and even insurgent groups dates from the first wave of independence in the 1960s, China is in some ways playing catch-up to many other powers. France and the United Kingdom have maintained security assistance ties to most of their former colonies, including training and equipping forces and even advising operations. France has deployed and based combat troops on the continent continually since decolonization; these forces frequently take direct action. The United States has increased a broad spectrum of military and security assistance across Africa since the establishment of U.S. Africa Command in 2008 and deploys operational forces to advise African forces and take direct action. Russia continues to be a leading source of arms to customer governments in Africa and recently developed a security advisory role with the Central African Republic. New players are enhancing their role: For example, the

United Arab Emirates conducts military operations in East and North Africa, and Israel assists with intelligence, surveillance, and reconnaissance capabilities. Numerous other countries, such as Brazil, India, and Pakistan, offer equipment sales and PME programs.[70]

The attractiveness of each type of assistance depends on the quality of foreign programs and the receptivity of recipients. Some assistance is intended to boost short-term military capabilities and performance; other types enable long-term reform and effectiveness. Taking into account each type of assistance, the following discussion identifies the extent to which China is responsive to African requirements. It first reviews some areas where China is minimally involved, if at all; then turns to areas where China is moderately involved; and last addresses the types of security assistance for which China is a major purveyor. Table 2 captures the results.

Little or No Chinese Involvement

China has almost no recorded involvement in defense institution–building. Some foreign partners offer assistance to enhance the accountability, transparency, and effectiveness of African defense institutions. These long-term enhancements could enable African countries to better prepare and support troops in the battlefield, for instance, through improved budgeting processes or personnel management; however, governments must be committed to reform to realize results. This is an area where the United States, France, the United Kingdom, and the European Union have been involved. It is not clear that China is or intends to be active in this arena.[71] Given that the PLA is focused on implementing its own major institutional reforms, it is unclear whether it could be a source of assistance in the near future.

Table 2. Overview of Descriptive Findings

Level of Chinese Involvement	International Security Assistance in Africa
Little or none	Defense institution building, combat advisory support, direct action
Some	Tactical and technical training
Major	Professional military education, arms sales, financing and infrastructure, intelligence and surveillance

Neither has the PLA provided much or any combat advisory support. Foreign partners can actively advise and accompany African troops on missions, helping to identify enemy targets, devise tactical plans, and execute operations. Such partnerships can better guide and control how foreign training, intelligence, and equipment are used, but they can be challenging and risky if foreign partners and host-nation forces have divergent priorities.[72] French, U.S., and, increasingly, Russian forces have engaged in such assistance; however, Beijing has only recently been willing to deploy combat troops to Africa, mainly under the banner of UN peacekeeping. The PLA has not engaged in combat operations in Africa on a bilateral basis, likely due to a combination of China's traditional principle of nonintervention, the continuing development of the PLA's capabilities, and Beijing's slow, cautious, and incremental approach to accepting more risk on deployments abroad.[73]

Finally, China is not likely to undertake direct military action. France, the United States, and the United Arab Emirates are among the countries that have been willing to take direct action against terrorist targets in Africa, usually in cooperation with African partner forces. Although China has amplified PLA troop deployments to UN peacekeeping missions in Africa and antipiracy operations in the Gulf of Aden, Beijing has given no sign that it would countenance such operations outside of a UN mandate.[74] China's 2015 Africa white paper focuses on bilateral capacity-building and intelligence-sharing activities, not direct operational involvement.

Some Chinese Involvement

China has modestly participated in combat training on the African continent. Combat instruction for Africa's ground troops includes basic, advanced infantry, CT, border security, and special operations training. Foreign partners also train African pilots and sailors. Sometimes foreign mentors are embedded in African militaries for long durations. These personnel include active-duty military personnel and private contractors hired by Western or African governments. The United States, France, and other foreign partners offer to prepare units for deployment to peacekeeping operations. Technical training can cover logistics, human rights and civil-military relations, campaign-planning, intelligence collection and analysis, improvised explosive device detection and disarmament, and operational integration. Improvements to technical aspects of operations can be a

"force multiplier"—enhancing the employment of troops and equipment—but might be less alluring to recipients than combat training and equipment.[75]

China has been infrequently involved in sustained tactical training of entire units. Among the recent exceptions, in 2019, the PLA claimed to train 1,600 Rwandan troops for 107 days to improve parading formations and movements in advance of a parade marking the 25th anniversary of the Rwandan genocide.[76] In 2017, the PLA completed an 18-month training program for a new DRC "rapid reaction brigade."[77] Other DRC units have received instruction from China, Belgium, Angola, and the United States. U.S. forces last trained a Congolese "commando battalion" in 2010, suggesting little direct competition in offering infantry drills.[78] The PLA invites some foreign personnel to its peacekeeping training center in China, but news reports suggest that the courses largely involve PME and not the sort of unit-wide predeployment peacekeeping training that the United States offers.[79]

Beijing's preferred, or at least more frequent, approach to training seems to be in ad hoc combined exercises. From 2014 to 2018, the PLA conducted 21 combined exercises with 11 different African militaries—only 8 percent of its total international exercises during this time.[80] The exercises included medical training, naval maneuver and communication drills, joint defense drills, and army skills competitions. These engagements are small compared with the international exercises conducted by the United States.

The United States has far more training engagements and partnerships across Africa than does China; most countries that the PLA will approach for engagement will have a standing U.S. relationship, so competition will inevitably heighten as PLA engagements grow. Table 3 includes the 12 African militaries that have participated in Chinese exercises from 2014 to 2018, the number of Chinese exercises they have joined, and the number of recurring U.S. exercises they have joined (each exercise counted once). This data shows that most countries with which the PLA has sought training partnerships already have reoccurring training exercises with the U.S. military. The two exceptions are Sudan, which has been under U.S. sanctions for decades, and Namibia. Conversely, the PLA has not exercised with Zimbabwe—a country that has been under U.S. sanctions for years and ostensibly has close diplomatic ties to China. In Africa, U.S. forces run 9 annual or biannual multilateral exercises that have included a total of 41 different participant countries.[81]

Table 3. Chinese Exercise Partners in Africa, 2014–2018

Participant	Number of Chinese Exercises (single event)	Number of U.S. Exercises (recurring)
Nigeria	3	4
Ghana	3	2
Mali	3	2
Sudan	3	0
Niger	2	3
Cameroon	2	2
Djibouti	2	2
Gabon	2	2
South Africa	2	2
Tanzania	2	1
Senegal	1	4
Namibia	1	0

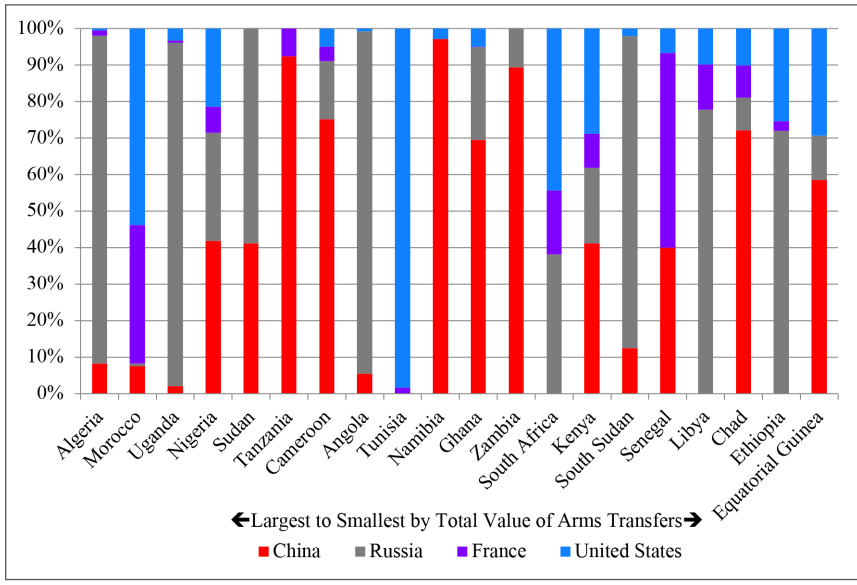
Source: NDU Chinese Military Diplomacy Database and U.S. Africa Command public Web site

Major Chinese Involvement

One area where the PLA is significantly involved in Africa is arms sales. Arms and equipment can be sold, granted, or supplied as part of a comprehensive "train and equip" package. If used effectively, more or better arms can tangibly enhance capabilities. However, in some cases arms and equipment might not provide a relevant enhancement to a military's most needed capabilities, might not be sustained or maintained, and might not be used with accountability for results, legality, and human rights.[82]

Between the 2008–2012 and 2013–2017 periods, arms imports by African states decreased by 22 percent. This downturn corresponds with a continent-wide economic slump, mainly due to falling global (largely Chinese) demand for African commodities. Despite China's decreased commodity imports from Africa, Chinese arms exports actually *increased* by 55 percent, with China's total market share growing from 8.4 to 17 percent (compared with the U.S. share of 11 percent). Algeria was by far the largest arms purchaser and Morocco second, followed by 22 customers in sub-Saharan Africa. Russia's market share fell steeply—by 32 percent between the

Figure 2. Share of Arms Sales among China, Russia, France and United States, 2008–2018



Source: SIPRI arms transfer data.

two periods—yet was still Africa's top arms source, accounting for 39 percent of imports.[83]

Does China dominate a set of countries as their primary arms source, or is it competing directly with other major exporters? The data suggests both. Figure 2 compares China's share of arms sales against those by France, Russia, and the United States, whose combined sales totaled at least $50 million. The countries are ordered left to right from largest arms customer to smallest. China's biggest customer in Africa is Algeria, which received $882 million worth of Chinese arms between 2008 and 2018. That said, China's market share is overshadowed by the $9.5 billion worth of arms sold by Russia to Algeria in this period.

The size of the sub-Saharan Africa market is smaller but quite varied. There are both larger arms markets, such as Tanzania ($367 million in Chinese sales) and Cameroon ($212 million), and smaller markets such as Chad ($57 million), Equatorial Guinea ($34 million), and Zambia ($117 million) in which China dominates. By contrast, in such markets as Kenya ($40 million),

Nigeria ($271 million), and Senegal ($36 million), China is clearly competing with other major suppliers.[84]

A review of the type of arms sold reveals that the United States and China are supplying different types and quality of equipment. From 2014 to 2018, China was a frequent source of armored personnel vehicles and patrol craft for several African customers. Sudan and Zambia each purchased six supersonic fighter jets with guided munitions. Perhaps most significantly, Algeria and Nigeria each purchased armed UAVs—which they would not have been permitted to purchase from the United States due to restrictions under the Missile Technology Control Regime and other accords.[85]

One of the largest arms importers in sub-Saharan Africa, Nigeria, is notable for having many suppliers: 16 different countries sold weapons systems to Nigeria between 2014 and 2018. In addition to 5 CH-3 UAVs, China delivered 2 navy corvettes and 120 armored personnel carriers (APCs), and it gifted a single patrol craft. Nigeria also received 26 APCs, 4 combat aircraft, and an offshore patrol vessel and ordered 12 ground attack planes from the United States with precision-guided missiles, indicating some overlap in type of weapons systems. Ukraine sold tanks, Russia sold combat and transport helicopters, and both Brazil and Pakistan sold combat aircraft to round out major suppliers to the crowded Nigerian market.[86]

In contrast to the stiff international competition for the Nigerian market, China has captured a significant market share in Sudan, a country that has been diplomatically isolated by Western countries. Between 2014 and 2018, China delivered 50 tanks, 50 infantry fighting vehicles, 6 fighter jets, and hundreds of towed multiple rocket launchers to Khartoum. Belarus and Russia were the only other countries that sold arms to Sudan during this time, delivering helicopters, bombers, and APCs.[87]

Distinct from other security and defense cooperation, China's arms sales to Africa are not clearly linked to other foreign policy efforts but seem broadly offered to interested buyers. For instance, arms sales are not mentioned in the FOCAC action plan for strengthening China-Africa relations, but they are marketed in defense and weapons-specific forums abroad such as the International Defense Exhibition and Conference.[88] As the data analysis reveals, arms exports correlate more with China's nonmilitary exports ($r = 0.43$) than political relationships ($r = 0.27$), which would be consistent with a profit motive.

Another area of significant security cooperation is in PME for African militaries. Many countries offer places in their officer training schools and war colleges to African students. Such exchanges can develop professionalism, increase the effectiveness of African forces over the long term, and build international relationships if the exchange officers are promoted to key leadership positions in their home institutions. This is not always a one-way street: Morocco, Nigeria, South Africa, and others have long offered spots in their staff courses to foreign officers.

As previously mentioned, China's PME programs are extensive; however, no data and little reporting exist on how many Africans attend Chinese programs each year and from which countries. The Web site of the PLA NDU International College of Defense Studies mentions students from Algeria, Benin, Burundi, Cameroon, Chad, Comoros, Cote d'Ivoire, Republic of Congo, Djibouti, DRC, Gabon, Guinea, Madagascar, Mali, Mauritania, Niger, Nigeria, Togo, and Tunisia.[89] All of these countries also send personnel to U.S. PME programs. The United States offered PME and training to an average of 1,000 military personnel, representing nearly every African country, per year between 2014 and 2017.[90] So, PME offerings can be seen as an area of direct competition, even as single militaries can send officers to multiple schools abroad.

An additional significant area, one where China is clearly dominant, is military financing and infrastructure development; it fills a critical need among African countries, which are relatively weak fiscally and economically. According to the China-Africa Research Initiative, from 2003 to 2017, China loaned $2.53 billion to eight African countries explicitly for military and national defense purposes. More than $1 billion of this money went to facility construction, with other funds going toward aircraft, naval vessels, networks, and surveillance systems.[91] In 2015, China promised $100 million toward the long-planned African Union Standby Force. In 2018, Tanzania opened a $30 million military training center built and financed by China.[92] In contrast, between 2003 and 2017, the United States provided $753 million in foreign military financing to African countries, with only $15.4 million in military construction projects.[93]

A final area of major Chinese involvement concerns intelligence and surveillance. Foreign partners can provide intelligence to African militaries, including through information-sharing, development of organic intelligence collection systems, or sustained airborne reconnaissance in support of African

operations. The impact of intelligence support depends on a military's ability to integrate intelligence into operational planning and to execute operations.[94] By its nature, intelligence-sharing and cooperation among states are secretive activities. Even the existence of agreements to share intelligence is rarely public. Still, we do know something of China's intent in these matters. For years, Beijing has publicly signaled a desire to improve intelligence cooperation with African states.[95] China's 2015 Africa policy white paper and the 2018 FOCAC action plan set objectives to strengthen intelligence exchanges and capacity-building, specifically on the issues of CT and transnational organized crime; however, we are unlikely to glean much insight into the extent to which such relationships are developing with African partners.

More visible cooperation is occurring on the installation of electronic surveillance systems in African countries, including with the Safe City system. For instance, in 2018, Huawei posted a video testimony of Ghana's security minister on its official Safe City Web site. The security minister describes a massive project for which Huawei had installed 2,000 cameras, with an additional 8,000 planned. He also claims that Huawei trained 15,000 civilian, police, military, and border control personnel.[96] The scale of this project is striking given that Ghana is one of Africa's more open and democratic countries and has not suffered from terrorism or extreme criminality like some of its neighbors. It suggests that the African market for these systems is quite broad, including beyond authoritarian regimes.

Israel is a major competitor to China in surveillance systems for African customers. News reports indicate that Israeli firms have sold various surveillance systems to many African governments in the past decade or so. Israeli products seem to be more focused on online surveillance than on physical security. Nonetheless, media and company Web site information suggests that there are several African clients for Chinese and Israeli systems. This implies that there are few customers who purchase systems from both China and Israel.[97]

Conclusion

China's use of security assistance to support foreign policy strategy is not nearly as developed as its civilian and economic engagement and cooperation, including efforts through the BRI. Nevertheless, this chapter argued

that Beijing has increasingly tied security assistance to its diplomacy to increase China's global stature and influence. The data analysis on China-Africa military relations found that China's level of security assistance can be explained by the combination of Beijing's desire for stronger diplomatic relationships, the size of a partner country, the value of Chinese imports from the country, and the value of Chinese arms exports to the country. It also found that China's arms sales are moderately correlated with the value of other Chinese exports ($r = 0.45$), suggesting that arms remain more a business interest than a geopolitical instrument.

The chapter also reviewed China's ability and willingness to compete with other major powers for African security partners. Sometimes Beijing's security engagement overlaps or comes into direct competition with assistance offered by the United States and other major powers, and sometimes it fills a gap in foreign engagement. The areas where China's effort to expand security assistance and cooperation most closely competes with the United States and other powers are PME programs and arms sales. But foreign partnerships in these areas are not necessarily mutually exclusive. PME is a relatively low-cost form of cooperation and influence: Sending officers to China's programs does not exclude a country from sending the same or different officers to PME institutions in the United States, France, Britain, or elsewhere. In arms sales, China competes more directly with Russia than with the West for African markets, as much or more on business than on political terms. Chinese and Russian firms offer systems that Western countries may be unwilling to sell for policy reasons (such as armed drones), often at lower prices.

China has the potential to lead the field, particularly in Africa, in provision of surveillance systems and military financing and infrastructure. Safe City sales are growing rapidly, and China is willing to provide security financing and infrastructure assistance to a variety of countries. Surveillance assistance, although offered through private firms, is touted by Beijing as an official part of China's global outreach. These state-of-the-art systems are tendered at relatively low prices and with few conditions.

But China still has not caught up to the top military assistance providers. China has not yet clearly demonstrated an ability and willingness to offer world-class military training, help develop defense institutions, provide combat advisory support, or take direct action abroad. Although the PLA's

international military training exercises are increasing, they are not close to matching the scale and quality of U.S.-sponsored exercises. Also, Beijing has been reticent to engage in internal conflicts abroad outside of a UN mandate. China will increase its stature as a major security assistance provider, particularly in niche areas, but seems unlikely to come close to replacing Western or even Russian partnerships without significant changes to PLA capabilities and the development of a more risk-acceptant foreign policy. Instead of offering a competitive alternative to Western security assistance, a senior PLA security cooperation official in 2017 floated the idea of cooperating with the United States to train and equip African troops deploying to peacekeeping missions.[98]

Still, the PLA's activities close to home should be watched for indicators of new capabilities being deployed farther afield and a new inclination to become involved in conflicts abroad on a bilateral or unilateral basis. For instance, the PLA stated that its August 2019 "joint counterterrorism exercise" with Tajikistan featured joint ground reconnaissance, integrated air-ground strikes, and UAV reconnaissance and surveillance.[99] This event suggests a movement toward increasingly sophisticated and mission-relevant engagement. To the extent that foreign countries are receptive to Beijing's offers, China's security assistance and cooperation programs have the potential for long-term growth to support an expanded global military and security role for China and the PLA.

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CHAPTER 11

PLA Cyber Operations: A New Type of Cross-Border Attack

By Ying-Yu Lin

The Internet has made its way to every corner of life. The rise of e-commerce has created business opportunities, while the application of Internet of Things technology has made modern society more dependent on high-tech products. But these developments are a double-edged sword: Internet technology has brought convenience as well as cyber threats. As our dependence on the Internet grows, cyberattack targets have moved from the virtual to the physical realm, and software disruption has been used to sabotage hardware.[1] Manipulation of information by state actors in the cyber realm has also become a problem, affecting public and elite opinion alike.

China's military has long sought to take advantage of the perceived overreliance of its foreign adversaries on information systems. Following the establishment of the Strategic Support Force (SSF) in 2016, the People's Liberation Army's (PLA's) cyber forces have been integrated to enhance their ability to operate in cyberspace; they have initiated a new type of hybrid warfare in the form of digital public opinion warfare. Taiwan has been a prime target. In September 2018, Taiwan's National Security Council released its first information security strategy report. According to the report, Taiwan's computer and communications systems have become a testing

ground for many information security threats and malware, with most of the attacks sourced from China.[2]

This chapter reviews PLA operations in the cyber domain through the case of Taiwan. It shows that China is becoming increasingly proficient in cyber warfare as a result of doctrine that highlights the importance of the information domain, recent reforms, and actual operational experience. The chapter is organized into three main sections. The first discusses the evolution of PLA doctrine and identifies where cyberattacks fit in; the second covers PLA organizations responsible for cyber operations and the impact of reforms undertaken under Xi Jinping; and the third analyzes three key types of PLA cyber operations—intelligence-gathering, targeting critical infrastructure, and psychological warfare. The conclusion considers the implications for the future of warfare and discusses several challenges the PLA will face as it seeks further progress in this area.

PLA Understanding of Cyber Warfare

Cyber warfare is a new domain of operations based on information technology, and it covers the Internet and the electromagnetic spectrum.[3] Internet conflicts include intrusions by hackers for the purpose of stealing information, attempts by a country to paralyze another country's infrastructure through software bugs, and misinformation spread via the Internet. Like other major militaries, the PLA considers cyber warfare a key form of operations.[4] In the Chinese context, however, cyber warfare is nested within the broader concept of information warfare. The term *information warfare* refers to how to use information science, technology, and equipment to assist military actions, with one side depriving, exploiting, sabotaging, or destroying the other side's information systems and information warfare capabilities while protecting its own systems.[5] In a nutshell, the PLA believes that the first thing to do to secure victory in war is to gain an information advantage.[6]

The origins of China's focus on information warfare can be traced to the 1991 Gulf War. Observing the rapid U.S. success in defeating the Iraqi military through a combination of joint operations and advanced command, control, communications, computers, intelligence, surveillance, and reconnaissance systems, the PLA recognized the need for its overall military system and strategy to be adjusted. A concrete step was taken in January 1993, when the Central

Military Commission (CMC) announced new military strategic guidelines based on the premise that the PLA would need to prepare for a regional war under high-tech conditions.[7] This shift led to a high level of emphasis on "informatization" and information warfare. As early as 2000, former PLA officer Shen Weiguang, having learned lessons from the U.S. military's performance in the Gulf War and the 1999 Kosovo War, began to consider how informatization would influence the conduct of future wars. Informationized warfare, as understood then, was focused on wartime operations, in hopes of furthering the PLA's ability to achieve integrated joint operations. Although cyber warfare is only part of information warfare, PLA analysts concluded that it could be used to enhance the prospects of battlefield success. For Shen, this argument corresponded with Mao Zedong's idea of people's war, a total war that involves both military personnel and civilians.[8]

In the early years, however, the PLA's understanding of the role of cyber warfare within this larger context remained limited. Some PLA scholars talked about the "digital battlefield," but few researchers delved specifically into this topic.[9] For instance, the 1999 volume *Unrestricted Warfare* treated cyberattacks as a new type of criminal activity, with limited attention to how cyber operations could be used to target enemy infrastructure in wartime.[10] Other articles provided little more than an introduction to such attacks and encouraged the PLA to learn lessons from the U.S. experience.[11]

In the 2000s, Major General Dai Qingmin and others gave more thought to how cyber operations could support information warfare.[12] In 2002, Dai, who was serving as the director of the PLA General Staff Department (GSD) Fourth Department (also known as the Electronic Countermeasures and Radar Department), wrote that the focus of the PLA's attention should be on "integrated network and electronic warfare."[13] This concept refers to the coordinated use of electronic warfare, cyber warfare, and kinetic kill methods to disrupt net-centric information systems that support the enemy's combat operations and ability to project power (referring specifically to challenging the ability of U.S. forces to intervene in a conflict in Asia). Because information warfare involves multiple disciplines, the PLA regards it as a type of "integrated joint operation" [*yiti lianhe zuozhan*, 一体联合作战].[14] Dai acknowledged that cyber warfare, characterized by engaging a stronger enemy with a force inferior both in strength and in number, is a new form of operations, but it will play a critical role in future wars.[15]

More recently, PLA analyses have addressed the role of cyber operations in spreading misinformation in peacetime and wartime.[16] In 2014, for instance, PLA scholars discussed the concept of "brain control" [*zhinaoquan*, 制脑权], which emphasizes that, in addition to efforts to control land, sea, air, and cyberspace, public opinion manipulation via media reports and propaganda campaigns will become an important part of the future battlespace.[17] To gain an advantage in this new arena, cyber forces will not just steal intelligence and infiltrate adversary information systems but also adopt new public opinion warfare tactics incorporating information technology.[18]

Despite increasing discussions among Chinese strategists, the PLA faced serious challenges in matching doctrinal prescriptions with actual cyber capabilities. One problem was a lack of qualified personnel to teach the new subject in the military's educational system.[19] Another problem was that the PLA lacked the technology to support informationized warfare. Finally, because the PLA did not have the right kind of personnel for cyber warfare, it had to rely on civilian hackers. All these problems hindered the PLA's attempts to develop sufficient cyber warfare capabilities, but those problems gradually eased in the 2000s with the cultivation of a cadre of cyber experts.

PLA Cyber Forces and Recent Organizational Changes

The PLA initially established a force of "information warriors" [*xinxi zhanshi*, 信息战士] in 1999. Those early information warriors were not active-duty servicemembers, and their competence and numbers were deemed inadequate to perform their basic missions. This weakness led the PLA to recruit cyber personnel from the information industry into new nationwide "information warfare militias" [*xinxi minbing*, 信息民兵], which were expected to engage in research, training, and military drills during peacetime and execute military missions during wartime (for a discussion of reserve and militia cyber units, see chapter 6 by John Chen, Joe McReynolds, and Kieran Green in this volume).[20]

From those humble beginnings, cyber experts gradually appeared in the active PLA under the former general departments, services, and military regions. Some units were part of the intelligence components of the general departments; this primarily included the former GSD's Second, Third, and Fourth Departments, which were responsible for human intelligence, electronic reconnaissance and surveillance, and electronic countermeasures

and radars, respectively. The General Political Department also had a liaison unit responsible for intelligence affairs, while the General Armament Department operated a unit dedicated to the collection of intelligence on foreign military technology. Other units were affiliated with the PLA's seven military regions and the navy, air force, and Second Artillery Force under their Technical Reconnaissance Bureaus.[21]

Despite this growth, the balkanization of PLA cyber capabilities increased waste and redundancy while reducing the effectiveness of PLA operations. Personnel specializing in hacking, for instance, would not have necessarily known much about intelligence analysis, creating a gap between technical support and intelligence analysis and reducing the PLA's overall cyberattack capacity.[22] The PLA's recognition of these deficiencies contributed to the military reform launched by Xi Jinping in late 2015.[23] Specifically, the SSF was established as a new independent force directly under the CMC and was not affiliated with any other CMC department or theater command. Reflecting the concept of "integrated network and electronic warfare," as championed by Dai and others, the SSF incorporates aerospace, electronic and electromagnetic warfare, intelligence, and cyber warfare units into a single command to meet the demands of future war.[24]

The creation of the SSF involved several key changes that could improve the PLA's effectiveness in the cyber domain. First is the consolidation of units previously located within different bureaucracies within the SSF Network Systems Department. While open source information on the Network Systems Department's subordinate units is scarce, the incorporation of units from the former GSD Second and Third Departments into the SSF can be inferred from the consolidation of the PLA Information Engineering University and the PLA University of Foreign Languages,[25] which were affiliated with the Second and Third Departments, respectively.[26] This consolidation of forces will not only reduce redundancy but also enable more effective coordination between cyber operators responsible for different missions, such as collection, analysis, and cyberattacks.

A second key change concerns leadership appointments at the top of this new bureaucracy. Past and current leaders of the Network Systems Department, including its first commander Zheng Junjie (who in 2019 served as both SSF deputy commander and chief of staff) and incumbent commander Ju

Qiansheng, had similar experience at the GSD Third Department. The appointment of cyber warfare–savvy officers as senior officials of the SSF's consolidated cyber forces will likely lead to more effective operational outcomes than would selecting commanders without relevant prior experience. This move will help prevent a situation where, as the saying goes, "The layman leads the experts."

A third important change concerns interaction between cyber units. Under the previous system, centered on the Technical Reconaissance Bureaus, cyber warriors focused solely on region-specific missions. In the revised system, malware samples that the author acquired in information exchanges with foreign institutes and individuals suggest that China's cyber units, which have been rebranded as Technical Reconaissance Bases, now interact quite closely with each other.[27] Given the consolidation of forces, it is reasonable to assume that Chinese cyber forces are now taking orders from top commanders to attack a diverse range of targets.

Operational Missions of China's Cyber Forces: The Case of Taiwan

Both prior to and after the recent restructuring of the PLA's cyber forces, Chinese information warriors were responsible for several types of operations.[28] This section reviews some of the most prominent operations and focuses specifically on operations against Taiwan. Key categories include the collection of valuable intelligence and technical data through advanced persistent threat (APT) attacks, cyber penetration to compromise adversary critical infrastructure, and psychological operations to influence public opinion. These operations could support PLA operations within the region and abroad, in both peacetime and wartime.

Intelligence-Gathering

The PLA has used APT attacks to gather intelligence since about 2005.[29] Such attacks are launched in sync with *zero-day vulnerabilities* (referring to an unknown weakness in a computer system) to penetrate an adversary's networks.[30] APT attacks are often enabled by "spear-phishing"—that is, involving emails tailor-made for the target.[31] The target will thus become less vigilant while downloading and executing files encoded with malware (which are normally disguised as a Word, PDF, Excel, or RTF document).[32] The PLA also uses advanced techniques such as port scan, bug, botnet, buffer overflow,

Trojan horse, Rootkit, Worm, and SQL injection.[33] Although the PLA typically seeks to conceal its involvement, these attacks involve technical skills and collection of the target's personal movements or data, both of which would likely be beyond the capabilities of individual hackers.

As an illustration of the PLA's sophistication, APT attacks can also be arranged according to the target's recent itinerary. For example, a Taiwan lawmaker, before being elected, received an invitation letter from a party posing as a government training center. He was invited to write an analysis and present the report at the center. He gladly accepted the invitation and provided personal information for subsidies for the trip; however, on the day the meeting was supposed to have been held, he found there was no such event. He later checked with the training center to find that it did not send any invitation to him. The email containing the fake invitation letter referred to a real unit and contact person.[34] Similar cases constantly happen with Taiwan scholars. Victims often receive invitations to participate in a research project or academic conference from parties identifying themselves as government agencies or public institutions. Unless the recipient calls to confirm the invitation, he or she will usually fall into the trap.[35]

Some of the most prominent examples of APT attacks involving PLA hackers include Operation *Aurora*, launched against Google in 2010,[36] and Operation *Night Dragon*, both of which were attributed to PLA Unit 61398 (a hacking unit previously subordinate to the PLA Third Department). The identification of this unit and its role in these activities was later disclosed in a highly publicized 2013 report issued by the U.S. cyber security firm Mandiant.[37] According to a 2011 McAfee report, Operation *Night Dragon* started with attacks via SQL injection on the target computer system's Internet Web server.[38] The target's Intranet was hacked into from the Internet using remote access tools (RATs). RATs were then utilized to send back large amounts of important files in Word, PPT, and PDF formats.[39] Social engineering techniques such as spear-phishing were also employed. In August 2011, McAfee identified Operation *Shady RAT* as another cyber intrusion directed by a "government agency." This operation also involved PLA Unit 61398. The "RAT" in the code name indicated that the operation involved remote access tools and evoked a rat lurking in the dark, always trying to sabotage or steal valuable objects.[40]

Between 2015 and 2018, PLA cyberattacks declined, apparently due to the reforms. Specifically, eight hacker units monitored by Western cyber security companies over a long period were reportedly inactive for a year or two between 2015 and 2018, which generally coincides with the period of reform. At first, the eight organizations suspended operations at different times, but they resumed operations and launched completely new types of cyberattacks simultaneously in the second half of 2018 with attack tools, methods, and a selection of targets that somewhat differed from those in the past. By the third quarter of 2018, those organizations had all been reactivated, including one that had been dormant from 2015 until the third quarter of 2018. In a nod to its identity, the hacking unit referred to as "Group A" in Western reports adopted the same Warning, Advice, and Reporting Point malware as that used by PLA Unit 61398.

Targeting Critical Infrastructure

PLA operations have sought not only to steal valuable information but also to penetrate networks responsible for critical infrastructure. China has never acknowledged launching cyberattacks against other countries' critical infrastructure, but in some Chinese research papers, cyberattacks are described as being capable of causing great damage to the other side in an armed conflict.[41] Some PLA studies, for instance, cite Russian cyberattacks against Ukrainian power plants or the U.S.-Israeli Stuxnet attacks on Iran's nuclear power plants as examples of effective targeting of adversary infrastructure.[42] These articles note that cyberattacks can be particularly effective against power systems, military logistics, and transportation systems.[43]

To attack other countries' critical infrastructure, the PLA needs to infiltrate networks using methods such as APT attacks and exploitation of zero-day vulnerabilities to plant viruses and malware in target systems. During an armed conflict with another country, China could activate the viruses planted in that country's critical infrastructure to paralyze social or military functions.[44] Integrating functions—including detecting the user's habits and systems, attacking (paralyzing or damaging), and disguising (to avoid being spotted by antivirus software)—into the virus code has therefore been the focus of China's recent development of digital weapons.[45] A useful reference for the PLA in this respect has been the activities of Russian cyber forces.[46]

China's cyber forces responsible for launching attacks on Taiwan are currently of two types: the Waterbear force (named by Trend Micro) and the Huipi force (named by Team 5 Inc.). These cyber forces are now under the command of the SSF. The Waterbear force had attacked the Web sites of the Taipei City government and the New Taipei City government,[47] infiltrating them mainly through management and information security software commonly used by the public sector. The Huipi force directs its attacks at Taiwan's transportation and logistics networks, typically planting commonly used SoftEther virtual private networks (VPNs) in target systems to facilitate the launch of "horizontal attacks" (in other words, hackers can use this process to attack other computers in the same network). Antivirus software generally does not respond to a VPN, creating a chance for the launch of a horizontal attack via Living-off-the-Land binary code commands.[48] This method makes it more difficult for antivirus software to detect the existence of malware.

Psychological Operations

Among the more recent PLA operations in the cyber domain is the use of cyber tools to manipulate foreign public opinion. Worldwide, the proliferation of social media platforms and digital media has created opportunities for states to spread misinformation to achieve their strategic goals. In public opinion warfare in the cyber domain, government content (or "troll") farms produce articles that are then sent via email or social media platforms to many people. Recipients typically do not read carefully before forwarding the article to someone else, thus becoming accomplices in spreading misinformation. Although some misinformation is patently false, a half-truth can easily grab public attention and become trustworthy as it reaches more people. Other methods of spreading misinformation are digitally altering photos or videos (known as "deepfakes") and adding false captions. These products have been used to slander major military or political figures in adversary countries.

As illustrated by Russia's extensive manipulation of public opinion, the spread of misinformation can be used to exacerbate rivalries between different political groups or factions or to sow internal discord in a target country. For instance, hackers can release radical statements purportedly from one group to intensify the contradictions between different groups. These

techniques can be used at a critical moment (as in an election) to push public opinion in the desired direction.

There is some evidence that PLA hackers have begun to emulate Russian operations by targeting political divisions on Taiwan. A notable example was the 2018 Taiwan mayoral and country magistrate elections. In the run-up to the elections, China supported certain preferred candidates by establishing online fan clubs and opening fake accounts to disseminate misinformation.[49] The motive was to arouse peoples' mistrust of the government, support the opposition Kuomintang to get more pro-mainland candidates elected, and undermine the ruling Democratic Progressive Party (DPP).

In a sign of growing coordination within the PLA, misinformation has also been tied with more traditional operations. A recent example concerns PLA military flights near Taiwan (for more analysis, see chapter 8 by Nathan Beauchamp-Mustafaga in this volume). Those operations were blended with several types of misinformation from Chinese sources. For instance, some media outlets reported these flights as "circumnavigating" Taiwan, even running deepfake photos showing an H-6 bomber flying against the background of Jade Mountain, the tallest mountain in Taiwan.[50] Another message was that the DPP government was wasting taxpayers' money by receiving poor deals on U.S. F-16Vs while Britain was spending less on more advanced F-35s. In reality, neither claim was true. China did send H-6 bombers close to Taiwan—but at quite a far distance from Jade Mountain. Taiwan did place an order for F-16Vs, but the deal was not comparable to the U.K. purchase of F-35s in terms of either the number of planes ordered or the total cost.[51]

The combination of real military actions and misinformation is an echo of the traditional Chinese philosophy of war as demonstrated in the following axiom: "An interplay of ordinary and extraordinary means and a combined use of real and fake moves." What was real was the military presence (H-6 flights); what was fake was the misinformation. The tactic incorporates what Sun Tzu says in the *Art of War*: "Subdue the enemy without engaging them militarily."[52] Such hybrid attacks have become a new operational mode for China's military, similar to the hybrid warfare that Russia launched in its annexation of Crimea in 2014. We can go so far as to say that the PLA's recent moves are copied from the Russian military.[53]

Conclusion

PLA cyberattacks can be expected to increase with the progress of information technology and the growing reliance of foreign citizens and governments on it. As Chinese military theorists contend, cyberspace has become a new fighting domain characterized by covertness and cross-border attacks without units actually deployed abroad. In some respects, these attacks may be even more powerful than traditional weapons.

China's offensive cyber forces have likely become even more effective following the most recent round of military reform, which placed cyber forces from different parts of the pre-reform structure under the SSF. Now that personnel responsible for information collection and analysis have been brought together with operators, China's cyber forces are like a tiger with wings, capable of launching more attacks against other countries in peacetime and wartime.

More effective PLA cyber capabilities will pose complex challenges for China's adversaries. The PLA will steal information on sought-after military and civilian technology, target adversary information systems, and manipulate foreign opinion in support of China's objectives, as demonstrated in recent activities against Taiwan. Moreover, combining cyber operations and real military actions enables an attack that mingles real moves with fake ones. This is a threat not only to Taiwan but also to many other countries in and beyond the Indo-Pacific region.

Nevertheless, the PLA will have to overcome several enduring challenges to reach its full potential in cyber warfare. First is its ability to recruit the necessary talent. Although the PLA is trying to develop cyber forces with the help of civilian universities or academic institutes subordinate to the military (such as the SSF University of Information Science and Technology), many people with a talent for information security do not necessarily want to lead a regular military life; most information security specialists have chosen to stay in the private sector. The military has responded by holding hacking competitions to identify potential recruits,[54] providing recruits with direct monetary support, and granting them certain privileges so that they can enjoy legal immunity as they engage in gray-area activities in cyberspace. This is a great incentive for Chinese hackers to work with their government, as they usually work in ways that tend to cross the boundaries of

law. Still, questions remain about the PLA's success in being able to compete effectively with private companies.[55]

A second challenge is ensuring political reliability among hackers within the PLA. The "hacker spirit" as recognized by most individuals engaged in these operations encompasses "entrepreneurship" and "challenging society."[56] These values contribute to the formation of many unwritten rules in hacker groups,[57] including the pursuit of a free spirit and a rebellious attitude in defiance of public power. These ideas are at variance with how the Chinese government and military apply Internet technology. China manages hackers in and outside the military in a very strict way, but this type of management may draw a backlash or result in a Chinese version of Edward Snowden.

Third is the PLA's ability to retain qualified hackers. Even if cyber personnel are politically reliable, they may become dissatisfied in their careers due to the military's strict management culture. In addition, senior officers who lack detailed knowledge of cyber warfare tend to appraise hackers with traditional evaluation criteria because they do not understand the value of the missions tasked to hackers. Therefore, quite a few hackers, after having served in the military for a limited period of time, have chosen to be discharged in order to seek more lucrative opportunities in private companies.

A final set of challenges concerns coordinating civilian and military cyber operations. China claims to operate an intelligence system that "works in unison," but constituent units have divergent missions. In the Chinese intelligence community, the Ministry of State Security is responsible for collecting and analyzing intelligence at home and abroad, so it handles mainly information theft and counterintelligence missions. The Third Institute of the Ministry of Public Security deals with management of domestic public opinion on the Internet and crackdown on cybercrimes. The Ministry of Industry and Information Technology is mainly responsible for responding to emergency situations on the Internet.[58] On the surface, these agencies launch cyberattacks just like the PLA's cyber forces do, but they differ considerably in their selection of targets and offensive and defensive capabilities.[59] In addition, these organizations are also plagued by problems such as ambiguity of authority and tendencies to court praise and pass the buck.[60] Thus, while synergies within the PLA may promote more effective operations, stovepipes between the military and civilian sectors could inhibit effective whole-of-government operations.

I am indebted to many friends in the information security field and hacker circle for their advice on information security technology. They included TDoH, LEUKOCYTE-LAB, Borg, and other local and foreign groups. These individuals also introduced me to other hackers, who, speaking on the condition of anonymity, offered me much advice on hacking practices.

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CHAPTER 12

Space and National Security: China's Great Leap Upward

By Dean Cheng

Since being charged with its "new historic missions" in 2004 by then–Central Military Commission Chairman Hu Jintao, the Chinese People's Liberation Army (PLA) has been assiduously striving to defend Chinese interests both near China and, increasingly, on a global scale. This broader operational focus has included a steady effort to improve its ability to operate across various domains. Its modernization program has seen enhancements not only in traditional military capabilities, such as air and naval forces, but also in the ability to operate in outer space. The development of Chinese military space capabilities is integral to the PLA's broader efforts at achieving "information dominance" in preparation for fighting "informationized local wars."

China's development of military space capabilities, however, like its broader space expansion, is unlikely to mirror the U.S. or Soviet experiences. Indeed, China's space program has followed a different path from that of either the United States or the Soviet Union. The U.S. space program is said to have begun on December 8, 1941, in the belief that satellites could have allowed earlier detection of the Japanese fleet and averted Pearl Harbor; the same might be said for the Soviet Union, which experienced the surprise of the June 22, 1941, German offensive. There is no real equivalent in recent

Chinese history of a similar strategic surprise. China's two wars with Japan, as well as its conflicts in Korea, with India and Vietnam, and on the Sino-Soviet border, did not begin with a thunderclap shock that might have been averted with better intelligence information, such as that afforded from space.

Moreover, China has, until recently, been poorer than either superpower, and even today considers itself a less developed country. It has always, therefore, had relatively fewer resources to commit to its space program. This raises the following questions: What has driven China's space program? How do Chinese military analysts view the importance of space? What progress has China made in this domain?

This chapter will address these questions in six sections. The first reviews the development of China's space programs from the Mao Zedong to the Hu eras. The second section places Chinese thinking about space in the context of changing PLA views of future warfare. The third and fourth sections survey concepts of space operations as described in PLA writings. The fifth section discusses the Strategic Support Force (SSF), which under recent reforms has been charged with space missions, while the sixth evaluates China's lunar program. The conclusion provides general takeaways about China's military developments in space.

China's Evolving Space Capabilities from Mao to Hu

Since the 1950s, China's space program has been producing capabilities relevant for both civilian and military purposes. It is considered to have been founded in 1958, soon after U.S.-trained scientist Qian Xuesen forwarded "A Proposal to Establish China's Defense Aviation Industry" to senior Chinese leadership. This document called for the creation of an aerospace industry, which would design and build not only aircraft but also rockets and missiles. His proposal was incorporated into the "National Long-Term Plan for the Development of Science and Technology, 1956–1967," a broad blueprint for the development of Chinese scientific and technical capabilities.[1]

Mao subsequently called for an indigenous Chinese space program, stating at the Second Plenum of the Eighth Party Congress in May 1958 that "we should also manufacture satellites."[2] As a result, China established the Fifth Research Academy of the Ministry of National Defense, responsible for missile development, with Qian as its head. Chinese histories generally date

the start of China's space, missile, and strategic weapons programs to the founding of the Fifth Academy. The initial space program, Project 581, reflects this 1958 start date.

Mao's vision of a Chinese space program following on the heels of Sputnik was extraordinarily ambitious for a nation that was still largely peasant, illiterate, and recovering from nearly 20 years of continuous war. Indeed, it was excessively ambitious, as China's human, financial, and industrial resources proved insufficient to sustain any kind of space development effort. Space capabilities nonetheless remained an official goal, embodied in the "two bombs, one satellite" [*liangdan yixing*, 两弹一星] program. This slogan referred to the creation of an atomic bomb, a hydrogen bomb, and a satellite. Beijing's aspiration was partly due to pragmatism: If China was to have a nuclear deterrent, it would have to develop a delivery system, which could also serve as a space launch vehicle.

"Two bombs, one satellite" referred not only to programmatic objectives but also to the idea of homegrown development of advanced capabilities. Because of the Sino-Soviet split, as well as the ongoing Cold War with the United States and Beijing's broader isolationist policies, China would have to rely on its own resources to develop its nuclear and missile capabilities. "Two bombs, one satellite" thus came to also be associated with the idea of indigenous development, and this characteristic remains the hallmark of China's space program. Although Project 581 was shelved by 1960, the larger "two bombs, one satellite" effort remained in place and bore fruit, including China's first atomic (fission) bomb test in 1964, hydrogen (fusion) bomb test in 1967, and satellite (*Dongfanghong*-1) launch in 1970.

After China successfully detonated its first hydrogen bomb, Beijing refocused on space launch and even expressed an interest in a manned space program. In April 1968, China combined assets from the Chinese Academy of Sciences, the Academy of Medical Science, and the Academy of Military Medical Science into the China Institute of Space Medicine [*zhongguo hangtian yixue gongcheng yanjiu suo*, 中国航天医学工程研究所], with Dr. Qian placed in charge of creating China's astronaut corps. Qian closely examined how the United States and the Soviet Union selected and trained their astronauts, and then began the process of recruiting Chinese astronauts. By March 1971, a group of 80 candidates had been winnowed to about 19. These personnel

would be launched aboard a spacecraft dubbed *Shuguang*-1 (*Dawn*-1), as part of Project 714. The plan was to launch *Shuguang*-1 by the end of 1973.[3]

For a variety of financial, industrial, and political reasons, the project was shelved, the pilots were returned to their units, and Project 714 was quietly abandoned; however, China's science community retained interest in expanding a presence in space. Ironically, this interest was dealt a major blow when Mao died and was replaced by Deng Xiaoping. Deng, eminently practical, showed little concern for space, except insofar as it could contribute to economic development. With the exception of communications satellites, though, most space endeavors seemed more a matter of spectacle than of gross domestic product growth.[4]

China's space program, including its manned space program, was revived by the efforts of four Chinese scientists: optical physicist Wang Daheng, nuclear physicist Wang Ganchang, electrical engineer Yang Jiachi, and electronics engineer Chen Fangyun.[5] These highly respected scientists, all of whom had ties to China's space and nuclear weapons programs, argued to Deng that, unless China was willing to invest in high technology, it could never technologically or economically catch up with the West. Conversely, investments in high technology would not only improve China's level of science and technology but would also help foster high-tech industries. These investments would, in turn, yield economic and military benefits.

Deng was so intrigued by their report that he initialed his copy with the instructions that this plan had to be acted on without delay. This led to the National High-Technology Research and Development Plan [*guojia gao jishu yanjiu fazhan jihua*, 国家高技术研究发展计划], also known as Plan 863.[6] The initial Plan 863 proposal focused on seven areas, including aerospace,[7] and included two programs related to manned spaceflight. The first program was Project 863-204, which called for developing a new, large launch vehicle as part of a space transportation system capable of servicing a small space station; the second was Project 863-205, which aimed to launch a small space station with advanced capabilities as well as associated scientific and technical research to support manned spaceflight.

After Deng's departure, China's space program benefited from renewed investment and high-level support. Under Jiang Zemin (1992–2002), China deployed both low-Earth orbit and geosynchronous weather satellites (the

Fengyun series), improved geosynchronous communications satellites (the *Dongfanghong*-3 series), and recoverable satellites with varying payloads (the *Fanhui Shi Weixing*-2 series). Earth observation capabilities also improved. In 1999, in cooperation with Brazil, China deployed the China-Brazil Earth Resources Satellite (CBERS), its first electro-optical imaging satellite capable of beaming pictures directly down to Earth. China subsequently launched several similar satellites with no Brazilian involvement; they are known as the *Ziyuan* series, to distinguish them from the CBERS satellites. In 2000, China launched two *Beidou* regional navigation satellites into geosynchronous orbit, at an altitude of approximately 24,000 miles, becoming only the third country to deploy its own position and navigation system. This system also has a communications function, which was employed during the 2008 Sichuan earthquake relief operations.[8]

After succeeding Jiang as party general secretary in 2002, Hu Jintao maintained support for China's space program. During his two terms, China launched a variety of additional satellites, including new remote sensing satellites (the *Yaogan* series), microsatellites such as the *Shijian* series, and enhanced versions of the *Fengyun* and *Ziyuan* satellites. Under Hu, China also orbited several manned spacecraft (the *Shenzhou* program) and initiated the nation's lunar exploration program, launching the *Chang'e*-1 and -2 lunar probes (discussed below). Supporting these programs was a space-industrial complex that is believed to number more than 200,000 people today. Two major aerospace conglomerates, the China Aerospace Science and Technology Corporation and the China Aerospace Science and Industry Corporation, manufacture the full range of space systems, including launch vehicles, satellites, and ground equipment, as well as the associated subsystems and support items.

To be sure, these investments were not solely for military purposes. Indeed, Deng's admonition to focus on national economic development still seems to resonate in many aspects of China's space program. China's work on Earth observation satellites, position and navigation systems, and weather satellites all support Chinese economic growth objectives. Nevertheless, these systems also provide the PLA with experience in launching and operating satellites as well as undertaking space surveillance—and, invariably, with a better understanding of the capabilities and limitations of space-based systems.

In addition to civilian and dual-use systems, the PLA developed during the Hu era counterspace capabilities, including the PLA's test of a direct-ascent, kinetic kill antisatellite (ASAT) system in January 2007. Launched from the Xichang Satellite Launch Center, the Chinese ASAT destroyed a defunct *Fengyun*-1C weather satellite in low orbit. In the process, China also generated a massive amount of space debris.[9] Almost 3 years later, in January 2010, China conducted what was termed an *antimissile test* involving "two geographically separated missile launch events with an exo-atmospheric collision also being observed by space-based sensors," according to the U.S. Department of Defense.[10] This test, however, likely also helped Chinese scientists improve their ASAT system. In August 2010, two Chinese microsatellites were deliberately maneuvered into close proximity and apparently "bumped" each other.[11] China has since tested an antisatellite system aimed at geosynchronous orbits, a capability no other nation has developed.[12] In short, sustained space advancement efforts through the 2010s provided China with the material and experiential basis for undertaking *military* space operations in the future, whether for regional or global contingencies.

Space and PLA Concepts of Modern Warfare

Just as China was pursuing broad-based economic modernization under Deng and his successors, a revolutionary shift in the nature of warfare was taking place. Modern warfare, as demonstrated in conflicts in the Middle East and southeast Europe, became increasingly dependent on the quality of forces and weapons, rather than quantity. The U.S.-led coalition performance against Iraq in Operation *Desert Shield*/*Desert Storm* served as a wake-up call for the PLA, demonstrating that modern high technology had fundamentally altered the operational art. As the then–deputy director of the PLA's Academy of Military Science (AMS), the PLA's "think-tank," observed, "The Gulf War marked a big step forward in both military theory and practice."[13]

The PLA extensively analyzed coalition operations and sought to incorporate the lessons learned into its own approach to war. The result was a thorough revision of almost every aspect of PLA thinking about future conflict. In 1993, the PLA produced a new set of "Military Strategic Guidelines for the New Period," introducing the concept of "local wars under modern, high-tech conditions." These guidelines constitute "the highest

level of national guidance and direction" to the Chinese armed forces.[14] In a December 1995 speech to the Central Military Commission, Jiang emphasized the importance of these new guidelines when he charged the PLA with undertaking the "Two Transformations" [*liangge zhuanbian*, 两个转变]. They included a shift from a military focused on quantity to one focused on quality, and from a military preparing for "local wars under modern conditions" to one that was preparing for "local wars under modern, high-tech conditions."[15]

According to PLA assessments, "local wars under high-tech conditions" were marked by several key characteristics. The most important feature was the growing reliance on joint operations as the basic form of military operations—and the attendant demand for improved command, control, communications, and intelligence (C3I)—in order to coordinate and integrate the disparate forces, especially across the broader field of operations at much higher operational tempos.[16]

As envisioned by the PLA, joint operations would involve multiple services operating together across significant distances. The Gulf War, for example, sprawled across some 140 million square kilometers and boasted forces ranging from armored units to aircraft carriers and long-range bombers.[17] The successful conduct of joint operations on this vast geographic scale would therefore require close coordination, extensive communications, and precise navigation and positioning information—both for units and for the growing plethora of precision munitions. Moreover, joint operations also called for coordination of combat and logistics forces and the ability to command and control operations across five domains: the traditional ones of land, sea, and air, but increasingly also outer space and the electromagnetic domain (for example, cyber and electronic warfare operations).

This need for improved C3I, spanning greater distances and in support of nonstop operations, convinced the PLA of the importance of space for future military operations; it recognized space capabilities as playing an essential role in "local war under modern, high-tech conditions." The 70 satellites that were brought to bear against Iraq in the Gulf War provided the U.S. military, according to PLA estimates, with 90 percent of its strategic intelligence and carried 70 percent of all transmitted data for coalition forces.[18] Indeed, these assets were the first to be employed, since they were essential for the success

of subsequent campaign activities. As one Chinese analysis observed, "Before the troops and horses move, the satellites are already moving."[19]

The PLA's conception of future wars was refined under Hu, with the information domain playing a more prominent role. From "local wars under modern, high-tech conditions," the PLA now expected to engage in "local wars under informationized conditions." This new phrase appeared in 2002 and was incorporated into China's 2004 defense white paper. "Informationized conditions," in this context, did not simply refer to computers and cyberwarfare; rather, the informationized battlefield [*xinxihua zhanchang*, 信息化战场] is one where all relevant military activities, including tactics, operations, and decisionmaking, are digitized, and military materials and equipment are managed through advanced information technology.[20] The shift in terminology reflected the PLA's conclusion that, among the various high technologies, the most critical are those relating to information management.

Such emphasis on the information domain was also reflected in an apparent modification of the "campaign basic guiding concept" [*zhanyi jiben zhidao sixiang*, 战役基本指导思想] during the 2000s. The concept, a distillation of military laws and theories, is intended to serve as a guide for PLA officers planning, organizing, and prosecuting campaign-level operations. In some ways, it parallels the "principles of war," which the U.S. Army defines as "the most important non-physical factors of war that affect the conduct of operations at the strategic, operational, and tactical levels," while taking into account contemporary conditions.[21] In the 2001 edition of the PLA textbook *The Science of Campaigns*, the "campaign basic guiding concept" for "local wars under modern, high-tech conditions" was established as "integrated operations, key point strikes" [*zhengti zuozhan, zhongdian daji*, 整体作战, 重点打击]. "Integrated operations" meant the integration of all forces, in all domains, and all methods of warfare, while "key point strikes" meant concentrating forces on the main strategic direction, at critical junctures and moments, and against essential enemy targets, so as to paralyze enemy forces.[22]

By the 2006 edition of *The Science of Campaigns*, the "campaign basic guiding concept" had changed to "integrated operations, precision strikes to control the enemy" [*zhengti zuozhan, jingda zhidi*, 整体作战, 精打制敌]. Precision strikes involve the use of munitions to attack vital targets. The goal

is not only to destroy key points but also to accurately control the course and intensity of a conflict.[23] Central to the conduct of such strikes is the ability to establish superiority over the information realm. Seizing information superiority or dominance [*zhi xinxi quan*, 制信息权] is seen as vital.[24] An essential means of attaining information dominance is through military space operations. The volume's authors state that "establishing space dominance, establishing information dominance, and establishing air dominance in a conflict will have influential effects."[25]

What did not change in the 2006 version of *The Science of Campaigns* was the central role of joint operations. Joint operations are still seen as a key part of "local wars under informationized conditions" and remain the means for the PLA "to bring the operational strengths of different services and arms into full play."[26] Similarly, space operations continue to be an important part of joint operations, whether under "high-tech" or "informationized" conditions. In the 2001 version of *The Science of Campaigns*, space is described as an essential part of fighting future wars, and the ability to undertake the kinds of operations needed to win such wars is rooted in the ability to exploit space.[27] The 2006 edition of that book states that "the space domain daily is becoming a vital battle-space. . . . Space has already become the new strategic high ground."[28] It is clear that the PLA has progressively emphasized the role of space in future military operations.

In addition to the PLA's emphasis on the role of space in future wars, Chinese leaders increasingly stressed the connection between space and overall national security. In December 2004, Hu gave a speech outlining the "historic missions of the PLA in the new phase of the new century" [*xinshiji xinjieduan wojun lishi shiming*, 新世纪新阶段我军历史使命]. These "new historic missions" included safeguarding China's expanding national interests, specifically access to space [*taikong*, 太空] and the electromagnetic sphere.[29] The speech also clearly charged the PLA with undertaking military space missions. Hu observed that "maritime security, space security, and electromagnetic spectrum security are already vital regions for national security," requiring Chinese military preparations to secure them.[30] The incorporation of space into the specific responsibilities of the PLA under the "new historic missions" indicated a growing view of space as essential to Chinese national security.

This higher profile for space is reflected in some of the most recent authoritative PLA and Chinese government sources. The 2013 edition of *The Science of Military Strategy* devotes a chapter to discussing military conflict in the space and cyber (as well as nuclear) domains; the authors note that the importance of space has grown considerably for both military and broader national purposes.[31] The 2015 National Security Law specifically mentions outer space as an area where Chinese security interests must be preserved. Similarly, China's 2015 defense white paper refers several times to space as a "commanding height" in the international strategic competition. The 2019 defense white paper stresses outer space as an area where China's national interests must be safeguarded: "Outer space is a critical domain in international strategic competition. Outer space security provides strategic assurance for national and social development."[32] As the PLA's military guidelines have shifted again, to "informationized local wars," the role of space has become ever more salient.

China's Evolving Concepts of Military Space Operations

Various PLA writings consistently emphasize achieving space dominance as part of any joint campaign. At this point, it is not yet clear, based on open source materials, whether the PLA has promulgated a formal doctrine for military space operations to support securing space dominance; however, PLA writings do discuss key attributes that any doctrine would likely contain. In particular, there appears to be a "guiding thought" [*zhidao sixiang*, 指导思想] for space operations. For the PLA, the "guiding thought" establishes certain principles that are expected to inform doctrine, activities, and acquisition. The "guiding thought" for space operations, like the assessment of the importance of space dominance, appears to have been evolving over the past two decades. This section describes this evolution through an examination of PLA writings from 2005 and 2013.

The View from 2005

In 2005, Major General Chang Xianqi, who at one point served as the head of the General Armament Department (GAD) Academy of Command Equipment and Technology, published the second edition of *Military Astronautics*, which was used as a textbook for teaching PLA officers about military space operations. In this volume, Chang proposed a "guiding thought" for space operations

of "unified operations, key point is space dominance."[33] According to Chang and other PLA sources from the same period, the establishment of space dominance [*zhitian quan*, 制天权] entails unified operations [*yiti zuozhan*, 一体作战]. Unified operations, in turn, involves unified *forces*, unified *techniques*, and unified *operational activities*.[34] Each of these concepts requires some elaboration.

"Unified forces" involves two aspects. The first is the integration of civilian and military space systems, both in prewar planning and wartime application; this provides a more robust capability at a lowered cost. The second aspect is unifying space forces with land, sea, air, and electromagnetic forces in joint operations. Terrestrial forces benefit from space support, while terrestrial forces can both degrade opponents' space forces (for example, through attacks against ground stations) and preserve one's own space capabilities (by defending against comparable attacks).[35]

"Unified techniques" combine soft-kill and hard-kill methods. It should be noted that both hard- and soft-kill techniques serve the same ends, which is to reduce an opponent's advantage in space while preserving one's own, in order to achieve space dominance. Soft-kill techniques such as dazzling or cyberattacks are less likely to incur international repercussions but might allow an opponent to recover.[36] Hard-kill techniques could be aimed at destroying satellites (such as in the 2007 ASAT test) but also include physical attacks against tracking, telemetry, and control (TT&C) facilities and launch sites.

"Unified operational activities" involve coordinating offensive and defensive operations. Offensive activities, which may include both soft-kill and hard-kill methods, are likely to be undertaken at the earliest possible moment in order to seize the initiative and force the enemy into a reactive mode.[37] Meanwhile, defensive activities will also be executed to limit the effectiveness of enemy efforts to interfere with, seize, destroy, or disrupt one's own space systems.[38] These activities might include active measures, such as air defense, and passive measures, such as camouflage, disguise of space-related facilities, redundancy, and mobility. Mobile TT&C facilities, for example, should be developed and deployed to concealed locations, ready to replace fixed sites should the latter be attacked.[39]

The purpose of the "unified operations" outlined in *Military Astronautics* is to establish space dominance or superiority. To do so, one needs to ensure the uninterrupted operation of space information collection and transmission

systems. This includes the smooth operation of satellites, launch facilities, TT&C systems, and the attendant data links that bind the components together. Achieving space dominance therefore must also take into account the sustainment of the entire structure of terrestrial and space systems and its associated data and communications links, while striving to degrade or destroy an opponent's space systems.[40] To the latter end, Chang proposed that unified operations should be conducted at crucial moments of the campaign against an opponent's most important space targets, referring to the key information and space assets that would most affect the enemy's combat capabilities.[41]

The View from 2013

In the late 1990s, the AMS published a series of teaching materials for PLA officers pursuing a master's degree. These materials were intended to supplement Chinese textbooks and covered various aspects of "military science," such as command and control of joint operations. In the late 2000s, the AMS began to publish a second edition, expanded to 65 volumes. They not only updated some previous volumes but also covered new topics, including space operations. In the 2013 *Science of Space Operations Teaching Materials*, it is clear that the "guiding thought" for space operations has evolved and expanded. It is now described as "active defense, all-aspects unified, key point is dominating space."[42] Each phrase embodies several essential concepts.

"Active defense" is integral to all Chinese military strategy, not just space-related operations. While assuming a defensive position at the strategic level, the concept emphasizes seizing the initiative at the tactical and operational levels. In the context of space operations, "active defense" similarly stresses a strategically defensive stance—but one that seeks to deter aggression and maintain national security and interests. At the same time, it involves space combat preparations to be able to seize the initiative in a conflict. In particular, "active defense" presumes "offensive actions at the campaign and tactical level to secure strategically defensive goals."[43] Moreover, the inclusion of "active defense" in the "guiding thought" might reflect the elevation of space operations to a strategically significant role.

"All aspects unified" refers to the need to merge thinking about various aspects of space operations. As in the 2005 volume, it involves viewing the warfighting domains—including not only space but also land, sea, air, and

the electromagnetic spectrum—in an integrated way. Space operations support terrestrial operations, while land, sea, air, and computer network operations can help achieve space superiority. Again, this approach involves perceiving various wartime activities—including offensive and defensive operations, provision of information support and fire support, and hard- and soft-kill methods—as united, rather than as discrete phases, tasks, or methods. However, a defining feature of "all aspects unified" is the integration of space operations into larger joint campaign planning and command and control functions to help achieve terrestrial objectives. Command and control of space operations must therefore reconcile space-related requirements, timing, and structure with those of the overarching joint campaign.[44]

"Key point is establishing space dominance" expands the PLA's emphasis on striking the enemy's key points [*zhongda yao hai*, 重打要害], especially those nodes within the enemy's combat system-of-systems [*zuozhan tixi*, 作战体系]. The concept has two meanings. First, it reminds PLA officers and staff that securing space dominance must be a priority. Resources must be applied against an enemy's space systems (for example, terrestrial facilities, orbiting platforms, and data links) to disrupt and deny their ability to exploit space. Given the importance of space systems for navigation, positioning, and timing, disruption of associated networks will result in interference of the enemy's observe, orient, decide, act loop.[45] Therefore, key point strikes in joint operations should seek—through complementary hard and soft means—to interrupt the enemy's information collection and transmission nodes and command and control networks. Moreover, these attacks must be sustained throughout the conflict, but special attention should be paid to the first battle; there it is important to secure maximum effect, as it is likely to influence the entire course of the conflict. Second, the concept refers to defending one's own space infrastructure from enemy attempts to achieve space dominance (see below for more on defensive missions).

Chinese analysts also recognize that space systems are fragile and extremely expensive, so even wealthy nations are unlikely to have a substantial reserve of platforms.[46] Nor do many nations have a redundant terrestrial space launch and mission control network. (In this regard, it is worth noting that, with the inauguration of the Hainan Island space port, China will have four space launch facilities.) Therefore, space operations need to be focused,

not scattershot. To maximize effect, attacks against adversary space infrastructure need to be carefully coordinated and undertaken at essential moments in the overall campaign.

Mission Areas Associated with Space Operations

PLA analysts contend that military space operations are likely to entail five broad styles [*yangshi*, 样式] or mission areas: space deterrence, space blockades, space strike operations, space defense operations, and provision of space information support.[47] Although the tasks have not fundamentally changed between 2005 and 2013, their ordering, presumably reflecting rank, has. In particular, it is likely that as the PLA has gained experience with both space weapons and space-based information systems, it has realized the importance of being able to neutralize adversary space systems. Offensive strikes will not only deny the adversary information derived from space but also help the PLA preserve its own information collection and transmission capabilities.

Space Deterrence

Space deterrence [*kongjian weishe*, 空间威慑] is the use of space capabilities to deter or coerce an opponent, preventing the outbreak of conflict or limiting its extent should it occur. By displaying its space capabilities and demonstrating determination and will, the PLA hopes to induce doubt and fear in opponents so that they either abandon their goals or limit the scale, intensity, and types of operations. Space deterrence is not aimed solely, or even necessarily, at deterring actions in space; rather, in conjunction with nuclear, conventional, and informational limitation capabilities and activities, it seeks to influence an opponent's overall perceptions and activities.[48]

Both the 2005 and 2013 volumes referenced above suggest a perceived hierarchy of space deterrence actions exists, perhaps akin to an "escalation ladder." First, "displays of space forces and weapons" [*kongjian liliang xianshi*, 空间力量显示] occur in peacetime or at the onset of a crisis. The objective is to warn an opponent, in the hopes of dissuading them from escalating a crisis or pursuing courses of action that will lead to conflict. Second, "military space exercises" [*kongjian junshi yanxi*, 空间军事演习] are undertaken if displays of space forces and weapons are insufficient to compel an opponent to alter course. They can involve actual forces or computer simulations and are

intended to demonstrate one's capabilities but also military preparations and readiness; such exercises will also improve one's military space force readiness. Third, "space force deployments" [*kongjian liliang bushu*, 空间力量部署] are seen as a significant escalation that occurs when one concludes that an opponent is engaged in preparations for war; they involve the rapid adjustment of space force deployments, including the recall of certain space assets and modifications of orbits or behavior of others. As with military space exercises, this measure is intended to deter an opponent, but should deterrence fail, it might also improve one's own preparations for combat.

Chinese sources describe the final step of space deterrence as "space shock and awe strikes" [*kongjian zhenshe daji*, 空间震慑打击]. If the three previous nonkinetic measures are insufficient, the PLA suggests punitive strikes to warn an opponent that one is prepared for full-blown conflict in defense of the nation. Such strikes are seen as "the highest, and final, technique" [*zuigao xingshi he zui hou shouduan*, 最高形式和最后手段] to deter and dissuade an opponent. Employing hard- and soft-kill methods, one would attack an opponent's physical space infrastructure or data links, respectively. If this action succeeds, opposing decisionmakers will be shaken and cease their activities; if it fails, an opponent's forces will still have suffered some damage and losses.

Space Blockade

Space blockades [*kongjian fengsuo zuozhan*, 空间封锁作战] involve the use of space and terrestrial forces to prevent an opponent from entering space and gathering or transmitting information through it. Chinese writings suggest that there are several types of space blockades. First is physically obstructing an adversary's operations, such as blockading terrestrial space facilities, including launch and TT&C sites and mission control centers, or preventing spacecraft from entering certain orbits. Second is obstructing launch windows by delaying launches. In the past, some U.S. space launches have been delayed because fishing and pleasure boats were present downrange.[49] Third are information blockades, which can take several forms. For instance, by interfering with an opponent's data links, one can effectively neutralize an orbiting satellite by hijacking its control systems or preventing ground control from issuing instructions. Alternatively, one can contaminate or block the data that the satellite is gathering or transmitting. Yet another form involves "dazzling"

a satellite using low-powered directed energy weapons against its sensors or other systems. In each case, the intent is to achieve a "mission kill," whereby the satellite cannot perform its functions but is not necessarily destroyed.

Space Strike Operations

Space strike operations [*kongjian tuji zuozhan*, 空间突击作战] involve space and other forces undertaking offensive operations against an enemy's land, sea, air, and space assets. They are therefore not limited to attacks against the adversary's space infrastructure. In the Chinese view, space strike operations are marked by "integrated operations; stealth and surprise; key point strikes; rapid, decisive action."[50] In this formula, "integrated operations" reflects all the aspects discussed earlier, with an additional emphasis on exploiting "stealth and surprise." "Key point strikes," part of the general guiding thought for space operations, denotes the reality that neither side is likely to field large numbers of space systems, so planning for maximum effect and efficiency is important. "Rapid, decisive action" refers to the need to use space strikes to seize the initiative in a campaign. By overwhelming an opponent and sustaining strikes afterward, one can gain the initiative and ideally achieve operational goals and end the conflict. At the same time, due to the limited space platforms and weapons likely to be available, and their fragility and expense (which limits numbers acquired), space strike operations are expected to be of relatively limited duration.

Defensive Space Operations

Defensive space operations [*kongjian fangyu zuozhan*, 空间防御作战] are meant to counter an opponent's space strike operations by safeguarding one's own space forces and defending key strategic and campaign targets from enemy space strike operations. Defensive space operations include defense against ballistic and cruise missiles, defense of space-related bases and infrastructure, and spacecraft defensive operations. The last of these involves a combination of active and passive measures, including camouflage and reduction of spacecraft radar, infrared and electronic signatures so that one's capabilities and identity are obscured, shifting to "swarms" of small satellites to improve resilience if one or more component satellites are lost, and hardening satellites to allow them to survive attacks from directed energy weapons. In addition, ground controllers can move satellites if there are indications that they might be attacked.

Space Information Support Operations

In the 2005 edition of *Military Astronautics*, provision of information support by space systems was listed as the second task, after space deterrence.[51] In the 2013 PLA teaching materials, it is now the fifth of five tasks. This downgrade suggests that space information support operations [*kongjian xinxi zhiyuan zuozhan*, 空间信息支援作战], while still important, are being eclipsed by more active space offensive and defensive operations. Indeed, as one Chinese analyst observes, as space resources become ever more important, and military aerospace technology, especially that related to offensive space operations, steadily develops, space force development will shift from providing information support toward securing space dominance.[52]

Nonetheless, in the context of informationized warfare, space information support will be vital to achieving space dominance. As the 2013 edition of *The Science of Military Strategy* notes, "Space information support is now and for a long time into the future will be the main form [*zhuyao fangshi*, 主要方式] by which various nations apply space strength."[53] As the PLA emphasizes joint operations, it will increasingly depend on space-based systems to provide information support, especially as Chinese forces move farther away from Chinese territory (and therefore, land-based information support infrastructure). Key tasks within "space information support" [*kongjian xinxi zhiyuan*, 空间信息支援] for ground, air, and naval forces include space reconnaissance and surveillance; missile early warning; communications and data relay; position, navigation, and timing services; and Earth observation, such as geodesy, hydrographics, and meteorology. These capabilities will likely become more important to the PLA as it shifts toward a more globally oriented force.

Creation of the PLA Strategic Support Force

Further reinforcing China's military focus on space has been the establishment of the SSF (see chapter 6 by John Chen, Joe McReynolds, and Kieran Green in this volume). The SSF combined the PLA's electronic warfare, network warfare, and space warfare capabilities, including what had previously been specific departments under the General Staff Department (GSD), such as the GSD Third Department (responsible for signals intelligence) and the GSD Fourth Department (responsible for electronic intelligence and

electronic warfare). The move also transferred key space facilities that had been part of the GAD, including China's launch sites, satellite control centers, TT&C facilities, and fleet of space surveillance ships.[54]

One reason for the establishment of the SSF appears to be to shift from a task- or mission-oriented approach to warfare (for example, reconnaissance, strike) to one more focused on specific domains.[55] As a service, the SSF will be responsible for planning, force construction, and operations within the information domain, including space operations. Although the GAD had space responsibilities, it was neither a service nor a warfighting entity. The GAD's main tasks were supporting military research and development, including new weapons, as well as managing China's nuclear and space facilities. Establishing the SSF effectively created a service that more specifically addressed space warfighting doctrine and forces rather than space systems and capabilities.

Moreover, this new service is "intended to create synergies between disparate information warfare capabilities, in order to execute specific types of strategic missions."[56] By uniting various information-related departments, offices, and bureaus across the PLA, many of the organizational stovepipes that impeded programmatic and doctrinal coordination have been effectively eliminated. In the case of space operations, the SSF's Space Systems Department now oversees GAD space facilities and units responsible for space-based command, control, communications, computers, intelligence, surveillance, and reconnaissance (such as space-based remote sensing) that had resided in the GSD.[57]

At the same time, by placing the SSF Space Systems Department alongside the Network Systems Department, responsible for cyber and electronic warfare, there is greater ability to integrate space operations with other activities in the information domain. Chinese writings emphasize the importance of electronic and network warfare as key means of establishing space dominance, as soft-kill approaches (for example, laser dazzlers, cyberattack methods against TT&C facilities and onboard systems) are an essential complement to hard-kill ones (for example, direct ascent antisatellite missiles, co-orbital antisatellite systems). Placement of all these capabilities in the same service, albeit in separate subordinate departments, allows PLA space dominance efforts to benefit from enhanced coordination and integration. In

this regard, unlike many other nations, China is not pushing the development of a "space force" so much as an "information warfare force" with a substantial space capability embedded within it.

Chinese Lunar Program

The advancement of China's space capabilities has not been wholly oriented toward explicit military objectives. Well before the establishment of the SSF, the Chinese had authorized the Chinese Lunar Exploration Program. The *Chang'e* program, named after a goddess of Chinese mythology who lives on the Moon (with her pet, "Jade Rabbit"), began in 2004. It has its own leading small group (like the manned program) and its own leadership structure separate from the China National Space Administration.

The lunar program has followed a three-step approach. The first step was to place satellites in *lunar orbit* to ensure that China's launch vehicles and TT&C networks were sufficient to place spacecraft in the lunar vicinity. The deployment of lunar orbiters would also allow for mapping of the Moon's gravitational field and allow imaging of the lunar surface to determine suitable landing sites. The second step was to *soft-land* probes on the lunar surface—a substantially more difficult task because relatively few states have actually landed spacecraft on the Moon. It would require even more precise control of spacecraft functions, including being able to trim and adjust the spacecraft's attitude relative to the lunar surface. The deployment of a rover would also increase weight and add additional complications to the mission (for example, how to deploy the rover and how to keep it operational during the long lunar night, which lasts roughly 2 weeks). The third step is to undertake *sample retrieval* missions, where Chinese probes would bring lunar material back to Earth for further study. The weight involved is even greater, as the lander would have to carry sufficient fuel to at least depart the lunar surface, whether to reach a lunar orbiter module or to return straight to Earth.

As of 2020, China has undertaken the first two phases during its four missions to the Moon and environs.[58] These missions are detailed in the figure.

A fundamental part of the *Chang'e*-4 mission was the need to maintain communications with the lander. Because *Chang'e*-4 would land on the far side of the Moon, direct communications with the lander would be impossible; consequently, the Chinese deployed the *Queqiao* relay satellite to

Figure. Key Milestones in China's Lunar Program

***Chang'e*-1.** Launched on October 24, 2007, by a Long March-3A rocket, *Chang'e*-1 was slowly nudged into lunar orbit. During the mission, the craft used microwave signals to produce high-resolution images of the lunar surface. After two years of mapping and surveying (during which time it found evidence that there is far less helium-3 than expected), the craft was deliberately crashed into the lunar surface.*

***Chang'e*-2.** Launched in 2008, the second Chinese lunar mission undertook an even more extensive mapping effort, in part to help determine locations for China's first lunar landers. Reportedly a backup satellite to *Chang'e*-1, the new probe produced an array of images, and then was dispatched to LaGrange Point-2 (L-2), making China the third country to visit that region of space.† After undertaking measurements and surveys at L-2, *Chang'e*-2 was then dispatched to rendezvous with an asteroid, and then moved to explore deep space. *Chang'e*-2 is therefore the farthest object launched by China, and is helping China calibrate and test its deep space surveillance, tracking, and communications networks.

***Chang'e*-3.** China became the third nation to soft land on the Moon, and the first since 1976, when *Chang'e*-3 landed at Mare Imbrium on December 4, 2013. Capturing the Chinese public's attention was Yutu (Jade Rabbit), a six-wheeled rover that moved across the lunar surface, taking photographs and digging for samples. Yutu beamed data back for two and a half years.

***Chang'e*-4.** If China's earlier lunar probes had followed previous footsteps, *Chang'e*-4 marked a major first. The probe landed on the far side of the Moon on January 2, 2019, the first mission to land there. As important, it landed at the lunar south pole, another region that has been rarely visited and never physically explored. The lunar south pole is theoretically one of the areas most likely to have ice water, because portions of craters are likely to be in perpetual dark. The lunar far side has a distinctly different appearance from the lunar near side, and appears to have different chemical compositions. The mission has already identified material from the lunar mantle (thrown up from ancient meteor and comet impacts), another first.‡

***Chang'e*-5T1.** This robotic craft was a test of the *Chang'e*-5 systems. Launched in October 2014, the mission included both a return capsule that reentered Earth's atmosphere and a "service module" that went into lunar orbit.

* John Costello and Joe McReynolds, *China's Strategic Support Force: A Force for a New Era*, China Strategic Perspectives 13 (Washington, DC: NDU Press, 2018), 320.

† The five LaGrange points are where the Earth and Sun's gravitational fields cancel each other out. A spacecraft deployed to a LaGrange point will stay in the area with minimal adjustments required.

‡ Previous samples were taken from the lunar surface, which could not be confirmed as coming from the lunar mantle. See Chunlai Li et al., "*Chang'e*-4 Initial Spectroscopic Identification of Lunar Far Side Mantle-Derived Materials," *Nature* 569, May 15, 2019, 378–382, available at <https://www.nature.com/articles/s41586-019-1189-0>.

LaGrange Point–2 (L-2). Launched in May 2018, the *Queqiao* satellite arrived at L-2 some 24 days later. From its location 250,000 miles from Earth (and 40,000 miles from the Moon), L-2 relays data and instructions from Earth to the *Chang'e*-4/*Yutu*-2 probe.[59]

Politically speaking, China's lunar program has demonstrated a facility with undertaking cutting-edge scientific programs, as the innovative *Chang'e*-4 probe demonstrates. In terms of direct military benefits, the program's value is more limited. China is not in a direct space race with any other state, nor is it racing to establish settlements or "space colonies." China's manned space effort is currently averaging 2 years between missions, and its lunar efforts are even more punctuated. Although theories abound about how one might employ a lunar base to undertake surveillance or even kinetic operations against terrestrial targets, the costs associated with such ambitions would be enormous. Surveillance platforms on the Moon, for example, would be almost 240,000 miles from Earth; obtaining high-resolution images would be enormously costly. It is not at all clear that such efforts would win a cost-benefit analysis against systems in standard Earth orbits (low, medium, geosynchronous) or even air-breathing systems.

Instead, the most likely military benefits are in terms of improvements in Chinese space support capabilities, thus expanding the volume of space employed for military purposes. The deployment of the *Queqiao* satellite marked the first time that any nation has deployed an "application" satellite—that is, one not oriented toward scientific surveys and exploration—to any of the LaGrange points. Although some orbits go beyond the geosynchronous belt (for example, high Earth orbits and the graveyard orbit for inoperative satellites), the objects are still largely within the range of current space objective surveillance and identification (SOSI) systems. However, few SOSI systems are oriented toward general surveillance of the cislunar space between the geosynchronous belt and the Moon. By deploying "application" satellites to this area, China is challenging its own SOSI networks. This effort suggests that, in the coming years, Beijing will create a substantial SOSI network capable of surveilling a substantial volume of space. One element of this network that recently became operational is a 16-story, 35-meter array in Las Lajas, Argentina. It is operated by the China Satellite Launch and Tracking Control General, which used to be subordinated to the GAD but now belongs to the SSF.[60]

(In the past, China used its space program to justify establishing facilities in several countries, including Namibia, Kiribati, and Pakistan.)

Other states will have to upgrade their own SOSI capabilities. Until they do, however, China can try to conceal one or more satellites in that region of space. Such systems could serve as a strategic reserve, replacing satellites in lower orbits that might be destroyed or damaged in wartime. In theory, the *Queqiao* could be employed as a data relay satellite for purely terrestrial purposes; by no means would this be optimal, but attempting to destroy the satellite would be very difficult and likely engender a popular outcry by polluting a key region of space. If China were to expand its lunar footprint, it could well deploy many *Queqiao*-type satellites to L–2 or other LaGrange points and create a data relay constellation that would be difficult to track.

At the same time, because less international attention is paid to cislunar space, deployment of Chinese antisatellite systems into that area would complicate adversary contingency planning and attribution capacity. At present, most antisatellite systems are ground launched (such as the Chinese antisatellite system used in 2007) or co-orbital (such as the Russian Burevestnik system).[61] By contrast, an antisatellite system coming from beyond geosynchronous equatorial orbit would significantly expand the volume of space that would have to be surveilled.

An additional strategic military benefit from the Chinese lunar program is that it supports the broad goal of "civil-military fusion." This phrase refers to China's effort "to leverage breakthroughs in the civilian science and technology (S&T) sector" in order to meet the military's science and technological requirements.[62] This benefit is reflected in the shift in Chinese writings from calling for "civil-military integration" [*junmin jiehe*, 军民结合] to the more ambitious concept of "civil-military fusion" or "civil-military melding" [*junmin ronghe*, 军民融合]. The idea of "fusion" or "melding" underscores the need for a broader reorganization of the national economy so that the civilian and military sectors are served by a common industrial base.[63] The lunar program, with its demands for larger boosters (as required by the *Chang'e*-5 lander and its returning payload), further presses Chinese industry to support systems integration, systems engineering, and precision manufacturing. These improvements will allow China to develop better military systems, whether intercontinental ballistic missiles, unmanned aerial

vehicles, or military spacecraft—all of which are products from state-owned enterprises that are part of the Chinese space-industrial complex.

Conclusion

For the PLA and Chinese national security decisionmakers, the information age and the space age are inextricably linked. Both eras have been heavily influenced by the growth in computing power and the role of telecommunications. Indeed, China's first series of satellites, the *Dongfanghong*-2, were communications satellites, not early-warning satellites. Chinese analyses of recent wars underscore the intimate relationship between these two realms when it comes to warfighting. Modern wars have demonstrated the linked relationship between information and space, where space systems play a central role in the collection, transmission, and exploitation of information. Consequently, "seizing the space information advantage as a high ground is the first decisive condition for seizing information dominance, space dominance, air dominance, naval dominance, land dominance, and therefore the initiative in wartime."[64]

By dominating space, one gains several advantages in terms of access to information and managing its flow. First, combat forces can be much more effective because enemy and friendly force dispositions will be known. Second, because the battlefield is more transparent, commanders can respond in real time or near–real time to enemy actions, and widely separated units drawn from a variety of services can act in a highly integrated manner. Third, by dominating space, one has secured the most important portion of the battlefield: information. Such dominance facilitates command and control and enables long-range precision strikes. Friendly casualties are reduced, and one's own actions are much more effective.

For Chinese military planners, these advantages are further enhanced by certain geographic and strategic realities. Even now, the PLA is not oriented toward conducting extensive military operations far from China's shores; rather, it remains focused on regional flashpoints such as Taiwan, the Korean Peninsula, the South China Sea, and the Sino-Indian border. For Beijing, the consistent concern since the 1980s has been "local wars," which are not only limited in means but also in territory, occurring mainly on China's periphery. Space information support is less important, given the plethora of Chinese

intelligence-gathering platforms and dense communications networks, but space denial and counterspace capabilities are essential in countering any adversary (for example, the United States, Japan, and Taiwan).

That said, as its resources grow and its interests expand, China may depend more on space-based systems to provide intelligence about the military situation in places such as the Arabian Sea and the central Pacific or to maintain communications with PLA facilities in Djibouti and elsewhere (on Djibouti, see chapter 3 by Isaac Kardon in this volume). This is not to say that China will become as dependent on space as the United States—much less that its space architecture will resemble the American one. But China may become more reliant on space to sustain intelligence-gathering and global communications than it has been in the past.

China's interests in lunar exploration, as documented in this chapter, support broader efforts to develop its military space capabilities. Investments in lunar exploration—whether in terms of improving the industrial base, advancing SOSI networks, or familiarizing the SSF with operations in the regions beyond the geosynchronous belt—all contribute to developing China's space warfare capabilities, and therefore the nation's information warfare capabilities.

Notes

[1] Yanping Chen, "China's Space Activities, Policy and Organization, 1956–1986" (Ph.D. diss., The George Washington University, 1999), 7; and Deng Liqun, ed., *China Today: Defense Science and Technology* (Beijing: National Defense Industry Press, 1993), 1:32.

[2] Deng, ed., *China Today*, 1:356.

[3] Shu Wen, *"Shenzhou-VI": The Background Story* ['神六' 背后的故事] (Beijing: Chinese Language Press, 2005), 131.

[4] Deng's priorities in his early years were the "three grasps" of launching a liquid-fuel rocket into the central Pacific, successfully launching a solid-fuel rocket from underwater, and placing a communications satellite into geosynchronous orbit.

[5] Evan Feigenbaum, *China's Techno-Warriors* (Stanford, CA: Stanford University Press, 2003), 141.

[6] Material drawn from *Guojia Gao Jishu Yanjiu Fazhan Jihua 863*, in Foreign Broadcast Information Service–China (FBIS-CHI), July 21, 2000. For further discussion of the creation of Plan 863, see Feigenbaum, *China's Techno-Warriors*, 141–143.

[7] The initial seven areas were automation, biotechnology, energy, information technology, lasers, new materials, and space technology. Feigenbaum, *China's Techno-Warriors*, 157. The China Manned Space Engineering Office Web site, however, lists them as biotechnology, aerospace technology, information technology, advanced defense technology, automation, energy, and new materials.

[8] "Lu Jing: Satellite Communications—The Information Bridge During Earthquake Relief Operations" [吕晶：卫星通信—抗震救灾的信息之桥], speech before the Chinese Communications Studies Association, September 26, 2008.

[9] Leonard David, "China's Antisatellite Test: Worrisome Debris Cloud Encircles Earth," *Space.com*, February 2, 2007, available at <http://www.space.com/3415-china-anti-satellite-test-worrisome-debris-cloud-circles-earth.html>.

[10] "China: Missile Defense System Test Successful," *USA Today*, January 11, 2010, available at <http://www.usatoday.com/news/world/2010-01-11-china-missile-defense_N.htm>.

[11] William Matthews, "Chinese Puzzle," *Defense News*, September 6, 2010.

[12] Brian Weeden, "Through a Glass Darkly: Chinese, American, and Russian Anti-Satellite Testing in Space," *The Space Review*, March 17, 2014, available at <https://www.thespacereview.com/article/2473/1>.

[13] Shi Yukun, "Lt. Gen. Li Jijun Answers Questions on Nuclear Deterrence, Nation-State, and Information Age," *China Military Science* [中国军事科学] 3 (1995), in FBIS-CHI.

[14] David Finkelstein, "China's National Military Strategy: An Overview of the 'Military Strategic Guidelines,'" in *Right-Sizing the People's Liberation Army: Exploring the Contours of China's Military*, ed. Roy Kamphausen et al. (Carlisle, PA: Strategic Studies Institute, 2007), 82.

[15] Zhang Qinsheng and Li Bingyan, "Complete New Historical Transformations—Understanding Gained from Studying CMC Strategic Thinking on 'Two Transformations,'" *Jiefangjun Bao* [解放军报], January 14, 1997, in FBIS-CHI.

[16] Chinese Military Encyclopedia Committee, *Chinese Military Encyclopedia* [中国军事百科全书] (Beijing: Military Sciences Press, 1997), 2:126–127.

[17] Wang Houqing and Zhang Xingye, eds., *The Science of Campaigns* [战役学] (Beijing: National Defense University Press, 2000), 400.

[18] Gao Yubiao, ed., *Joint Campaign Course Materials* [联合战役学教程] (Beijing: Military Sciences Press, 2001), 54.

[19] Gao Qingjun, "Characteristics and Deficiencies of Space Reconnaissance in High-Tech Local Wars," *Journal of the Academy of Equipment Command and Technology* 1, no. 16 (2005), 52–56.

[20] PLA Encyclopedia Committee, *Chinese Military Encyclopedia*, 2:446. Interestingly, this definition equates "informationized battlefield" with "digitized battlefield" or "battlefield digitization."

[21] Field Manual 3-0, *Operations* (Washington, DC: Headquarters Department of the Army, 2008), A-1.

[22] For further discussion of "campaign basic guiding concepts," see David M. Finkelstein, *Evolving Operational Concepts of the Chinese People's Liberation Army and Navy: A Preliminary Exploration* (Alexandria, VA: CNA, 2002).

[23] Zhang Yuliang, ed., *The Science of Campaigns* [战役学] (Beijing: National Defense University Press, 2006), 81.

[24] Ibid.

[25] Ibid., 83.

[26] *China's National Defense in 2006* (Beijing: Information Office of the State Council, 2006), available at <http://en.people.cn/whitepaper/defense2006/defense2006.html>.

[27] Wang and Zhang, eds., *The Science of Campaigns*, 394.

[28] Zhang, ed., *The Science of Campaigns*, 87.

[29] The other historic missions include guaranteeing the continuing rule of the Chinese Communist Party, safeguarding national economic development, and helping ensure world peace. Hu Jintao, "See Clearly Our Military's Historic Missions in the New Period of the New Century" [认清新世纪新阶段我军历史使命], National Defense Education Web site of Jiangxi Province, December 24, 2004. For further discussion of the "new historic missions," see Daniel Hartnett, *Toward a Globally Focused Chinese Military: The Historic Missions of the Chinese Armed Forces* (Alexandria, VA: CNA, 2008).

[30] Hu, "See Clearly Our Military's Historic Missions."

[31] Academy of Military Science Strategy Research Department, *The Science of Military Strategy* [战略学] (Beijing: Military Sciences Press, 2013), 178–188.

[32] *China's National Defense in the New Era* (Beijing: State Council Information Office, 2019), available at <http://www.andrewerickson.com/2019/07/full-text-of-defense-white-paper-chinas-national-defense-in-the-new-era-english-chinese-versions/>.

[33] Chang Xianqi, *Military Astronautics* [军事航天学], 2nd ed. (Beijing: Defense Industries Press, 2005), 273–279.

[34] Note that *yiti* [一体] may be translated as either "integrated" or "unified." While the former translation is common, in the context here the latter would seem to be more appropriate. For that reason, as well as to avoid confusion with the term *zhengti* [整体], which is also translated as "integrated," we use the translation "unified" in this chapter.

[35] Chang, *Military Astronautics*, 275, 276.

[36] Ibid., 290.

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INDEX

Afghanistan, 31, 38, 43, 190, 268

Africa
- arms sales to, 269–270, 275, 277, 282–284, 287
- bundling of Chinese trade, investment, and aid in comprehensive packages, 272
- Chinese military financing and infrastructure development in, 285, 287
- Chinese participation in UN peacekeeping operations in, 237, 239–241, 242, 245, 247, 270–271, 272, 273
- combined exercises with, 271, 281
- drivers of military engagement in, 274–277, 284, 287
- military diplomacy events with each country in, 274–277
- PLAN port calls in, 271
- security assistance and cooperation activities in, 15, 264–265, 267–288
- threats faced by countries in, 278
- U.S.-China competition in, 272–274, 278, 279–281, 282–285, 287–288

African Union Standby Force, 271, 285

Air Force Engineering University, 204–205

Aircraft
- aerial refueling of, 214, 225
- AG-600, 35–36
- airborne early warning (AEW), 203, 211–212, 217, 221
- bombers, 199–226
- civilian, 55–56, 60
- domestic production of, 60
- H-6K, 199, 211–214, 215, 216, 217, 219, 220, 221, 225
- H-6N, 199–200, 222, 225
- H-20, 199–200, 205, 219, 222, 225
- helicopters, 60
- I1-10, 205–206
- I1-76, 35–36, 55, 60
- I1-78, 60
- J-8, 221
- J-10/J-11, 214, 217
- La-11, 205–206
- military transport, 55–56, 60
- problems using for strategic delivery, 55–56, 58
- stealth, 222–223, 225
- strategic bombers, 199–226
- strategic transport, 35, 55–56, 60
- Su-30, 214, 217
- Su-35, 216, 217

Tu-2, 205–206
Tu-154, 212, 214, 217
unmanned aerial vehicles (UAVs), 199–200, 205, 221–222, 269
unmanned combat aerial vehicles (UCAVs), 203, 205, 221, 269, 270, 284
Y-8, 212, 214, 217
Y-20, 35–36, 55, 60
Y-20U, 225

Airports, weaknesses in the ability to support strategic delivery, 58

Alaska, 224

Algeria, 270, 282, 283, 284, 285

Allen, Kenneth, 266, 268, 275

Alvaro, Artigas, 270

Amphibious landing operations, 54, 57

Antiterrorism, overseas cooperation in, 268–269

Argentina, 331

Arms and equipment sales, 265–266, 269–270, 275, 277, 282–284, 287

Australia, as potential target, 219, 220, 223

Aviation strategic delivery, capacity for, 55–56, 58, 60

Bangladesh, 270

Bashi Channel, 215, 216

Bay of Bengal, 30

Beauchamp-Mustafaga, Nathan, 7, 10, 11, 14

Beidou Navigation Satellite System, 38, 137, 315

Beijing Review, 254–255

Belt and Road Initiative (BRI), 26–27, 29, 31, 78, 92, 266, 272–273

Belt and Road Initiative "Maritime Silk Road," 30, 78

Bhutan, 189

Bishop, Bill, 275

Bitzinger, Richard, 270

Blasko, Dennis, 241, 246, 250

Bomber strike packages
Chinese technical research on, 203–205
composition of, 202–203, 204–206, 208–211, 214–215, 217, 221–222
doctrinal view of, 200–205, 210, 211, 216–217
integrated under a system-of-systems operations framework, 203, 204–205, 209–211, 217
training for, 205–211, 218–220

Border security
along the Sino-Pakistani border, 37–38
partnering with other countries' security forces, 43
PLA responsibility for, 110–111
and the threat of terrorism, 51
Xinjiang, 38

Brazil, 315

Burkina Faso, 273

Cambodia, 190, 223, 237, 266

Cameroon, 283, 285

Central African Republic, 278

Central Cyberspace Affairs Commission (CAC), 156, 158, 160, 163, 172–173

Central Military Commission
and development of a strategic delivery system, 61
direct control of the China Coast Guard and the People's Armed Police, 137, 190–191
emphasis on information warfare, 297
Joint Staff development, 114, 116–117, 119, 120–121, 239
Joint Staff Department, Joint Operations Command Center, 62–63, 114, 120–121, 156, 163, 164, 166, 174

Joint Staff Department, Network-Electronic Bureau, 166–167
Joint Staff Department, Overseas Operations Office, 40–41, 114
and "New Historic Missions," 109
and nuclear weapons, 116
Office of International Military Cooperation, 114
relationship to the Strategic Support Force, 116–117, 156, 158, 163, 164, 167–168, 171, 174
role in approval of cyberspace operations, 155, 163, 299
role in network operations, 156
role in reorganized PLA, 111–114, 265

Chang Wanquan, 136

Chang Xianqi, Major General, 320–321, 322

Chang'e lunar probes, 315, 329–333

Chen, John, 5, 14, 266, 268, 275

Chen Fangyun, 314

Cheng, Dean, 5, 10, 15

China Aerospace Science and Industry Corporation, 315

China Aerospace Science and Technology Corporation, 315

China-Africa Research Initiative, 285

China Air Force, 206

China-Brazil Earth Resources Satellite, 315

China Coast Guard, 132, 137, 142, 184, 185, 188–189, 190–191

China COSCO Shipping Company, 28

China Development Bank, 270

China Dream, 26–27

China Export-Import Bank, 270

China Harbor Engineering Corporation, 78

China Institute of Space Medicine, 313–314

China Merchants Port (CMPort), 78, 80, 94

China Ocean Shipping Company (COSCO) Shipping Ports, 78, 80, 82, 94

China Satellite Launch and Tracking Control General, 331

"China's Military Strategy," 2015 defense white paper, 25–26

Chinese Communist Party
and approval of Strategic Support Force strategic cyberspace operations, 154–155
assignment of international missions to the PLA, 74–76
emphasis on cooperation between the party, government, military, police, and civilians in border and coastal defense, 136–137
and foreign military sales, 270
and overseas basing for PLA logistic support, 75–76, 77
priorities in international relations, 75–76
and priority of information dominance, 154
use of a massive military parade to celebrate the 70th anniversary of the founding of the People's Republic of China, 184
use of the PLA to support the interests of, 2, 75–76, 107, 265

Chinese Communist Party Central Committee, Cyberspace and Informatization Commission, 156, 158

Chung Chieh, 5, 10, 12, 13

Civil-military integration
and cyberspace, 158, 160, 162–163, 298–299
and improvement of military transportation, 56–57, 60–61, 63–64

and ISR capabilities to cover maritime territorial claims, 132, 136–137, 139–140, 144
laws and regulations supporting, 63–65, 66
problems regarding ISR, 142
range of ways in which civilians support the PLA, 8–9
in space operations, 321, 332–333
use of for maritime strategic delivery, 57, 60–61
use of to improve airborne strategic delivery, 56, 60

Civil-Military Integration Development Law, 66

Cliff, Roger, 207, 210

Command and control
of cyberspace operations, 155–160, 163–168, 172–174
development of an integrated joint delivery command system, 62–63
effects of reorganization on, 39–40, 102–108
of joint operations, 9–10, 108, 110, 111, 114, 118–122, 129, 133–135, 136, 143, 317
and theater commands, 62–63, 114–117, 163–168, 215

Command of Theater Joint Operations, The, by Liu Wei, 129, 133–135, 136, 143

Congo, Democratic Republic of, 239–240, 242, 251, 281, 285

Costello, John, 143

Counterpiracy operations in the Gulf of Aden, 27, 30, 32, 34, 37, 73, 80–81, 187, 189

Counterterrorism operations, 31, 37, 268–269, 270

Cyber warfare, 51, 295–306
attacks on infrastructure, 300, 302–303
civilian role in approval of, 154–155
cyberspace public opinion warfare, 161–162, 295–296, 300, 303–304
and the development of digital weapons, 302–304
hacks of foreign computer systems, 191
integration of PLA cyber forces in the Strategic Support Force, 295
joint network warfare capabilities, 166
lack of qualified PLA personnel to conduct, 298
network attack, 161–162, 297
Operation *Aurora*, 301
Operation *Night Dragon*, 301
Operation *Shady RAT*, 301
PLA capabilities, 298, 300–304, 305–306
reliance on civilian hackers to conduct attacks, 298, 305–306
role in spreading misinformation, 298, 303–304
training of civilian reserve cyberspace forces and militia units, 162, 163
as a type of integrated joint operation, 297
use of advanced persistent threat attacks to gather intelligence, 300–302
use of civilian support forces in joint operations, 160–163

Cyprus, 238

Dai Bing, 272

Dai Qingmin, Major General, 154, 166–167, 297, 299

Dan Yi, 139

Dara Sakor, Cambodia, 223

Darfur, 237, 239–240, 242

Defense News, 219

Deng Xiaoping, 314, 315

Ding Laihang, 25

Djibouti
China's attack from on U.S. pilots, 189
Chinese military diplomatic events with, 275–277
PLA base in, 25–26, 27, 30, 41, 73–74, 80, 90, 91, 190, 223
U.S. base at Camp Lemonnier, 94

East China Sea
bomber exercises in the, 214–215
coordination of ISR activities in the, 138
unresolved territorial claims in, 109, 187

East China Sea Air Defense Identification Zone, 128, 138, 189, 214

East China Sea Joint Operations Command Center, 139

Engstrom, Jeffrey, 131

Equatorial Guinea, 283

Erickson, Andrew, 117

Expeditionary capabilities
air power, 35–36
challenges balancing competing requirements in the development of, 41–42
challenges for personnel and training, 39
challenges in the command, control, and coordination of, 39–41
competition between the PLA services to develop, 109, 117
conditions affecting China's option to use, 42
domestic support for the expansion of, 28–29
expansion of overseas interests as a driver of, 26–27, 108–109
increasing involvement in international security affairs as driver of, 27, 109–110
land power, 36–38
maritime, 32–35, 42–43
pressure on China to be a security provider in the international community, 27–28
space-based, 38
for strategic delivery, 51–52, 53, 117

Fiery Cross Reef base, 77

Finkelstein, David, 108

Fisher, Benjamin, 267–268

Forum on China-Africa Cooperation (FOCAC), 271–272, 284, 286

France, 278, 279, 280, 283

Gen, Nakatani, 138

Ghana, 286

Global Times, 28

Green, Kieran, 5, 14

Ground infrastructure for strategic delivery, 57–60, 65

Guam, as a potential target, 215, 216, 219–220

Guangzhou Military Region, 208

Gulf of Aden, PLAN counterpiracy operations in, 27, 32, 34, 73, 80–81, 187, 189

Gulf War (1990–1991), lessons taken by China from, 153, 200–201, 296–297, 316–318

Gunness, Kristen, 3, 12–13

Hai Jun, 58

Haifa, Israel, 94

Hainan Island, 323–324

Hainan Province, 140–141

Haiti, 28

Hambantota port, Sri Lanka, 90

Hanauer, Larry, 272

He Kai, 188

Heath, Timothy, 266

Holslag, Jonathan, 273

Hong Kong, 186–187

Hruby, Aubrey, 272

Hu Jintao, 2, 26, 108, 311, 315, 318, 319

Huanqui Shibao, 29

Huawei, 265–266, 270, 286

Humanitarian assistance and disaster relief, 28

Hutchison, 78, 80

India, 31, 76, 92, 186, 187, 189, 223–224

Informationized warfare
- dependence on improved ISR capabilities, 130, 132
- and the logistics support system, 62, 66
- role of cyber operations in, 296–297
- role of space operations in, 316–320, 328–329
- role of the Strategic Support Force in, 153, 172–174

Integrated Information and Firepower Warfare, 154

Integrated Network Electronic Warfare, 154, 166–167, 297, 299

Intelligence, surveillance, and reconnaissance (ISR) operations, 13–14
- civil-military coordination in, 132, 136–137, 139–140, 142, 144, 155–163
- components of the PLA's system, 131, 153
- and information security, 142
- integration of information at the theater level, 134–136, 141, 142–143, 144, 145
- military command and control of, 163–168
- in the Near Seas, 127–145
- need for better ISR capabilities to support expanded PLA missions, 131
- potential international responses to Chinese maritime ISR operations, 144
- and strategic information support, 143
- support for joint operations, 130, 132–136
- support for strategic delivery, 64–65
- "system of systems" approach to the coordination of the elements of the PLA's ISR system, 131
- theater-level integrated C41SR system, 132
- Triservice Tactical Information Distributed Network, 132

International relations
- Chinese contributions to international stability, 14–15, 37, 109–110, 118
- effects of Chinese port contracts on U.S. security relations with host countries, 12, 94–95
- host nation opposition to Chinese developments, 89, 90, 91
- primacy of economic considerations in, 75–76

Introduction to Cyberspace Operations, 152, 156, 160, 161, 164, 165–166

Israel, 94, 279, 286

Japan, 127, 138–139, 189, 214–215, 220

Japanese Defense Ministry, 214–215

Jiang Qianming, Major General, 267, 268

Jiang Zemin, 26, 314–315, 317

Jiefangjun Bao, 129, 137

Joint operations
- command and control of, 129, 133–135, 136, 143, 317
- expansion of joint delivery drills, 64
- insufficiency of in transport command, 59
- ISR support for, 130, 132–136, 155
- need for improved command, control, communications, and intelligence for, 317–318

need for improved education and training programs for, 59–60, 141–142
role of space operations in, 321–322, 326
Joint Publication 1-2, 24
Journal of Military Transportation University, 52
Journal of Ordnance Equipment Engineering, 52
Ju Qiansheng, 299–300
Juba, 241, 253, 254
Kang Huaihai, Rear Admiral, 170
Kardon, Isaac, 9, 12, 13
Kazakhstan, 31, 207
Kennan, George, 77
Kenya, 283–284
Kongjun Bao, 208–209, 211, 216, 222, 224–225
Korean War, 186, 188, 205, 206, 236
Kosovo, 200, 203, 297
Lampert, Ben, 277–278
Law of the People's Republic of China on National Defense Transportation, 63, 66
Lebanon, 237, 239–240, 242, 247, 249, 251
Li Chunpeng, Senior Captain, 80
Li Keqiang, 78
Liberation movements, aid to, 264
Liberia, 237
Libya, 28, 31, 189, 278
Liu Jiasheng, 56
Liu Rui, 218
Liu Wei, 129, 143
Logistic support
advantages of the strategic strongpoint model, 81–84
challenges to the PLA in providing for overseas missions, 41, 74
and civil-military integration, 83, 84–85, 93
information support for, 62, 64–65
Joint Logistic Support Centers, 61–62
overseas facilities to support PLA operations abroad, 73–95
strategic strongpoint model, 74, 77–86
support for strategic delivery, 57–59, 61–62
U.S. model, 76–77
Lunar Exploration Program, 315, 329–333, 334
Macau, 187
Mahan, Alfred Thayer, 77
Malacca Strait, 3
Malaysia, 83
Mali, 28–29, 39, 239–241, 242, 245, 247, 248–249, 254–255, 278, 285
Mandiant, 301
Mao Zedong, 297, 312–313
Maritime law enforcement agencies, 128, 130, 142
Maritime operations
counterpiracy, 27, 30, 32, 34, 37, 73, 80–81, 187, 189
gray-zone coercion, 128, 131, 136
priority of under Xi Jinping, 117
strategic delivery for, 57, 60–61
Maritime Power Strategy Forum (2016), 79
Maritime Silk Road, 30, 78, 79
McCaslin, Ian Burns, 117
McReynolds, Joe, 5, 14, 143
Middle East, Chinese participation in UN peacekeeping operations in, 237
Military Astronautics, 320–323, 324–325, 327

Military-civilian fusion. *See* Civil-military integration.

"Military Strategic Guidelines for the New Period," 316–317

Ministry of Foreign Affairs, 266

Ministry of National Defense
  Fifth Research Academy, 312–313
  Office of Peacekeeping Affairs, 239, 243, 245–246

Ministry of Public Security (MPS), 158, 160, 161, 162, 173, 306

Ministry of State Security (MSS), 158, 160, 161, 162, 173–174, 306

Missile development, 312–313

Miyako Strait, 127, 139, 212, 214, 215

Mohan, Giles, 277–278

Morocco, 282, 285

Morris, Lyle, 272

Multidimensional Integrated Stabilization Mission in Mali (MINUSMA), 239–241, 242

Namibia, 281, 332

National Defense Mobilization Law (2010), 86

National Defense Transportation Law (2017), 85, 86

National High-Technology Research and Development Plan (Plan 863), 314

"National Long-Term Plan for the Development of Science and Technology, 1956–1967," 312

National Security Law, 320

National Traffic War Readiness Office, 63

National Transportation Readiness Department, 85–86

"New Historic Missions," 2, 26, 74–75, 108, 109, 319

Nigeria, 278, 284, 285

Noncombatant evacuation operations (NEOs), 28, 31, 189

North Sea, 30

Nuclear weapons, 116, 117, 313

Obama, Barack, 28

Ohsumi Strait, 127, 138–139

Pakistan, 31, 35, 37–38, 43, 88, 190, 223, 269, 270, 332

Paracel Islands, 140

Pedersen, Eric, 130–131

People's Armed Forces Maritime Militia, 128, 130, 132, 137, 140, 142, 184, 185, 188–189, 190–191

People's Armed Police, 137, 184, 188, 189, 190–191, 269

People's Liberation Army
  Academy of Military Science, 316, 322
  adequacy of technical expertise to support joint operations, 141–142
  antisatellite systems, 316
  benefits of participation in UN peacekeeping operations, 246–251
  bilateral and multilateral exercises, 268
  building foreign language and cultural expertise as a benefit of participation in peacekeeping operations, 247–248, 254
  "campaign basic guiding concept," 318
  challenges to fielding expeditionary forces, 24
  "charm offensive," 266
  and command and control of overseas missions, 107–122
  and control of disputed maritime territory, 109
  coordination of ISR activities with other maritime security forces, 128, 130, 131–132, 136–137

counterspace capabilities, 316
and creation of a joint command system, 9, 110
and creation of the Strategic Support Force as a joint force, 168–172
cyber capabilities, 298, 300–304, 305
development of digital weapons, 302–303
development of expeditionary forces, 23–24, 109
disadvantages of the strategic strongpoint model of support for, 86–92
East China Sea Joint Operations Command Center, 139
effects of reorganization on command, control, and coordination of overseas forces, 39–40, 107–108
evolution of doctrine for military space operations, 320–324
expeditionary capabilities, 23, 25
focus on improving capability to attack Taiwan, 64–66
and guiding thought for space operations, 320–321, 322–323, 326
hacks of foreign computer systems, 191
Information Engineering University, 299
information warfare militias, 298
ISR activities between the East China Sea and the Western Pacific, 138
interservice rivalry, 117–118
joint command and control mechanisms, 9–10, 108, 110, 111, 114, 118–122, 129, 133–135, 136, 143, 317
Joint Logistic Support Force, 41
lack of coordination of missions with Chinese diplomacy, 265–267
lack of personnel to conduct cyber operations, 298, 305–306
lessons learned from observation of U.S. military operations, 200–201, 296–297, 316–318
and "local wars under informationized conditions," 316–320
logistical support for, 9, 12, 13, 41, 73–95
Logistics Academic Research Center, 52, 54–55
military space capabilities, 311–316, 324–327
missions, 23, 41–42, 74–77, 107–108, 110–111, 263, 319
National Defense University, 52
National Defense University International College of Defense Studies, 267–268, 285
National Defense University Joint Operations College, 141
need to balance funding regional versus global missions, 41–42
need to balance increasing militarization overseas with the PRC "non-interference principle," 92
noncombat operational activities, 188–190
organization of cyber forces, 298–300, 305
organizational structure of, 107–108, 111–114
participation in bilateral and multilateral exercises, 188, 190
participation in UN operations, 37, 109–110, 187, 189, 235–255
Peacekeeping Center, 239, 246
peacekeeping standby force, 37, 236, 242–245
and priority of establishing space dominance, 321–324, 327, 328–329, 333–334
as protector of PRC nationals and economic interests overseas, 26–27, 75, 108–109, 118, 263, 272
role in China's international security assistance and cooperation programs, 263–288

role of bombers in campaign planning, 200–205
and role of cyber operations in information warfare, 296–298
role of services in overseas missions, 111–114, 117–118, 119–120
and role of space operations in joint operations, 316–320, 321–323, 324–327
role of theater commands in overseas missions, 111–117, 118–119, 120
Security Regulations, 142
and space information support, 327
space launch facilities, 323–324
space operations mission areas, 324–327
space surveillance, 315–316
support for positive relations with other countries, 109–110
training for overseas missions, 35, 37, 39
trend toward use of more limited operations against others than in the past, 188
"Two Transformations" under Jiang Zemin, 317
units registered in the UN's Peacekeeping Capability Readiness System, 243–244
University of Foreign Languages, 299
use of commercial port facilities for logistics and intelligence support for overseas missions, 74, 79–86, 93–95
use of to shape the PRC security environment, 10–11
use of to support the Chinese Communist Party, 2, 75–76, 107

People's Liberation Army Air Force (PLAAF)
39th Regiment, 13th Transport Division, 35–36
Airborne Corps, 36
bomber strike packages with Chinese characteristics, 199–226
capability to conduct offensive long-range strikes, 199–200
and development of a strategic air force, 200, 201–202
and development of expeditionary capabilities, 109–110, 199–226
doctrine, 200–205, 210, 211, 216–217, 221
flights beyond the First Island Chain, 51, 200, 211–212, 214–215, 216, 218–220, 221
flights to the Second Island Chain, 216, 218–220, 224
impediments to pilot and aircrew proficiency, 224
inadequacy of logistic support for overseas missions, 87–88
and integration of bomber strike packages under a system-of-systems operations framework, 203, 207, 215
and ISR in the East China Sea, 138–139
interservice rivalry with PLAN regarding maritime operations, 225–226
lessons learned from U.S. military operations, 201
missions, 36
and noncombatant evacuation operations, 189
nuclear capability, 222
overseas facilities for, 35, 223
potential targets of, 219
role in potential attack on Taiwan, 202
strategic airlift capability, 35–36, 43
training flights, 14, 35, 199–220, 221
use of a Taiwan scenario in training exercises, 205, 208, 209–211
use of transport aircraft to deliver Chinese peacekeepers to Africa, 242
view of bomber operations as an "air operational system," 211, 217

People's Liberation Army Navy (PLAN)
aircraft carriers, 34

amphibious force development, 33–34
and building of overseas commercial ports to Chinese military standards, 85–86
and civil-military coordination, 137, 190–191
and command of overseas operations, 119–120
counterpiracy escort missions, 73, 187, 189
expeditionary capabilities, 32, 109, 110
fleet components, 32–33, 34
inadequacy of strategic strongpoint model to support overseas missions, 88–89
interservice rivalry with PLAAF regarding maritime operations, 225–226
and the Maritime Silk Road, 79
missions, 25–26, 30, 75
and noncombatant evacuation operations, 189
operations in the East China Sea, 127, 138–139
operations in the South China Sea, 188–189
port calls, 271
power projection abroad, 75–76
provision of platforms for PLAAF expeditionary missions, 35
role of the Djibouti base, 77
training, 39, 51–52
training for the marine corps, 43
training missions in cooperation with PLAAF, 209–211
use of commercial port facilities for logistics and intelligence support for overseas missions, 74, 79–81

People's Liberation Army Navy Marine Corps (PLANMC), 33–35, 41, 43

People's Liberation Army Rocket Force, 109, 110

People's Liberation Army special operations forces, 37

People's Liberation Army Strategic Support Force, 38, 151–174
command relationships with civilian organizations, 155–160, 162–163, 172–174
and integration of cyber forces, 295, 299, 303
joint network warfare capabilities, 166
leadership of, 299–300
military command and control of, 163–168
missions, 38, 143, 155, 162, 164
Network Systems Department, 299–300, 328–329
organizational structure, 151–152, 156, 158, 162, 164, 166–168, 299
as provider of information support operations for the PLA, 154
relationship with civilians, 154–163
relationship with theater commands, 116–117, 142–143, 163–168
role as a joint force, 168–172, 173, 174
role in joint information operations, 153–155
role in joint warfare, 172–174
role in strategic joint information operations, 164
Space Systems Department, 328–329
Space warfighting mission, 327–329
Technical Reconnaissance Bases, 166–168, 300
training of reservists and militia units, 162, 163
training of units, 171–172
University of Information Science and Technology, 305

use of civilian support forces in joint cyberspace operations, 160–163, 173–174
wartime missions, 154, 162

People's Liberation Army Strategic Support Force units
91709, 170, 173
91XXX series, 170
95921, 170, 173

People's Republic of China
13th Five Year Plan, 78
acceptance of risk in the use of force, 183, 185, 188, 192–193
compatibility of security assistance programs with overall foreign policy objectives, 265–267, 271–274, 286–288
and connection between space and national security, 319
and development of an astronaut corps, 313–314
emphasis on peace and development as priorities, 186
potential influence on decisions about use of UN peacekeeping operations to protect Chinese interests, 252–253
reputational benefits of participation in peacekeeping operations, 245–246
space program, 311–316
State Council, 78, 263, 265
"two bombs, one satellite," slogan, 313
unresolved territorial claims, 109
use of armed force, 183–193, 214

Persian Gulf, protection of trade routes transiting, 27, 30, 32, 34, 37, 43, 73, 80–81, 187, 189

Philippine Islands, 28, 219, 220

PLA Daily, 208

Ports, commercial
built, operated, and/or owned by Chinese firms, 77–95
involvement of PRC state-owned enterprises in, 77–78
local opposition to Chinese projects, 89–90, 91
PLA use of as overseas strategic strongpoints, 77, 79–86, 93–95
risks to China of further militarization of, 90–92, 93–95
threats to U.S. interests from, 94
use of Chinese military standards in the construction of, 84–86

Professional military education, 267–268, 281, 285, 287

"Proposal to Establish China's Defense Aviation Industry, A," 312

Public opinion, Chinese efforts to form, 28–29, 161–162, 295–296, 298, 300, 303–304

Qian Xuesen, 312–314

Queqiao relay satellite, 329, 331, 332

Raska, Michael, 270

Red Sea, 27

Regulations on National Defense Requirements for Transportation, Postal Service, Electric Power and Communications Infrastructure, 63

Regulations on the National Defense Mobilization of Civil Transport Resources, 63

Research on Cyberspace Superiority in Joint Operations, 152

Russia
and aid to Africa, 278, 280, 282–283, 284, 287, 288
cyber weapons, 302, 303–304
training exercises with, 35, 37, 190, 207, 221

Rwanda, 281

Sahel Group of Five, 273

Sansha City, 140–141

Sansha Maritime Militia, 131

Sanya Training Base, 39

Satellites
- *Beidou* regional navigation, 315
- development of, 313, 314–315
- *Queqiao* relay satellite, 329, 331, 332

Saunders, Phillip, 5, 11, 13, 266, 268, 275

Scarborough Shoal, 214, 220

Science of Campaigns
- 2001, 218, 219
- 2006, 200–201, 203, 218–219

Science of Military Strategy
- 2013, 79, 110, 130, 161, 201, 202, 320, 327
- 2015, 75–76, 84, 91

Science of Space Operations Teaching Materials, 2013, 322–323, 324–325, 326

Scobell, Andrew, 14

Sea lines of communication (SLOCs), security of, 29–30

Second Island Chain, Chinese airpower capability to reach U.S. military bases in, 219–220

Senegal, 284

Senkaku/Diaoyu Island, 109, 189

Senkaku Islands, 138

Shanghai Cooperation Organization, 37, 90, 190, 269

Shanghai International Port Group, 94

Shen Jinke, 214, 215, 216, 218

Shen Weiguang, 297

Shen Zhixiong, 273

Shinn, David, 273

Ships
- air defense systems on, 33
- aircraft carriers, 34
- amphibious, 33–34, 60–61
- capabilities of, 32
- civilian transport ships, 57, 64
- domestic production of, 60–61
- *Dongdiao*-class, 138–139
- guided-missile destroyers, 73
- hospital, 32
- *Jiangkai II*-class, 32
- supply ships, 73
- *Xining*, 73

Singapore, 220

"Smart City" security packages, 270, 271–272, 286, 287

Somalia, 278

South China Sea
- bomber training exercises over, 214–216, 219
- Chinese unilateral imposition of fishing bans in, 191
- construction and militarization of islands in, 127, 128–129, 139–140, 188–189, 223
- construction of air support facilities in, 35
- coordination of military and civilian activities in, 139–140
- harassment of other countries' vessels within the nine-dash line, 127, 139–140
- logistics base in, 77
- and maritime security, 30
- PLAN training in, 39
- unresolved territorial claims in, 109, 186, 187, 214

South Korea, 189, 190

South Sudan, 238, 239–240, 241, 245, 247, 248–249, 253, 270–271, 278

Soviet Union, 187

Soya Strait, 127

Space objective surveillance and identification (SOSI) systems, 331–332

Space operations
- antisatellite tests, 191, 332
- capabilities, 15, 38, 311–316, 324–327, 328
- role in informationized local wars, 316–320, 333–334

Space program
- focus on national economic development, 314–315
- manned space program, 313–314, 315, 330
- priority for achievement of space dominance, 321–324, 327, 328–329, 333–334
- Project 581, 313
- Project 714, 313–314

Spratly Islands, 109, 188, 220

Sri Lanka, 90, 223

State Committee of Border and Coastal Defense, 136

State Oceanic Administration, 137

State-owned enterprises
- and foreign military sales, 270
- involved in the construction and management of overseas ports, 77–79, 83, 84, 85
- role in overseas security assistance programs, 265–266

Stokes, Mark, 138

Strategic Air Force (2009), 201–202, 219

Strategic delivery
- airborne capacity, 54, 55–56
- amphibious capacity, 54, 57, 60–61
- capabilities for an attack on Taiwan, 53–60
- and civil-military integration, 56, 57, 60–61
- definition of, 53
- logistics support for, 57–59, 61–62, 66
- protection for system components, 65
- seaborne capacity, 54, 57

Strategic Delivery Regulations of China's People's Liberation Army, 63

Sudan, 237, 242, 281, 284

Sun Tzu, *Art of War*, 304

Sun Zhanjun, 176

Surveillance system sales, 276, 286, 287

Swaine, Michael, 266

Syria, 31

Taiwan
- China's claim to, 109, 186, 187
- Chinese capability to attack, 51–67
- Chinese military harassment of, 215, 216, 218, 219
- diplomatic isolation of as a Chinese political objective, 273
- emphasis on joint suppression warfare, 58
- as focus of China's cyber warfare forces, 295–296, 300–304
- information security strategy report, 295–296
- PLA military operations in the Taiwan Strait, 188
- projected "combat attrition rate" during a potential attack on, 54–55
- risk of attack from China, 66–67
- role of bomber strikes in a potential attack on, 202
- vulnerability to attack by China, 220

Tajikistan, 31, 38, 43, 190, 269, 288

Tanmen Township, 131

Tanzania, 283, 285

Technical Standards for Newly Built Civilian Ships Meeting Military Requirements, 64

Thailand, 35

Theater commands
- Central, 115, 135–136, 215, 242
- command relationships with Strategic Support Force personnel and units, 163–168
- coordination of bomber training flights, 215
- Eastern, 58, 61–62, 115, 139
- information support teams, 135–136
- and ISR integration, 128, 132–136, 141–143, 144, 145
- joint command and control structure, 114–117
- Joint Operations Command Centers, 62–63, 163–168
- Joint Staff Departments, 167
- logistic support bases, 61–62
- Network-Electronic Bureaus, 167
- Northern, 115, 242
- relationships with Strategic Support Force units, 116–117, 143
- responsibility for peacekeeping operations, 242
- responsibility for specific contingencies based on geography, 115, 118–119
- and Rocket Force units, 116
- role of in the reorganized PLA, 111–117
- Southern, 115, 215, 242
- Strategic Support Force role in joint operations control centers in, 164–168
- Western, 115, 242

Theater Joint Operations Command Center, 133–135, 139

Tibet, 186

Traffic Engineering and Technology for National Defense, 52

Training
- for bomber strike packages, 205–216
- of Chinese and foreign personnel for UN peacekeeping operations, 239, 248, 251, 281
- civilian participation in joint delivery drills, 64
- for inter-theater coordination of flights, 215, 221
- for joint delivery operations, 64, 65
- lack of sufficient training in joint operations, 141–142
- operational training for pilots and aircrews, 205–211, 218–220, 221, 224
- for overwater airstrikes, 205, 208–211
- precision maritime bomber strikes, 207, 210–211, 216, 218
- quality of PLAAF, 224–225
- of reserve cyberspace forces, 162, 163
- sea-air delivery drills, 64, 65
- of Strategic Support Force units, 171–172

Training exercises
- airfields used for, 216
- Anatolian Eagle, 35
- bilateral and multilateral with African countries, 271, 281
- China-Russia Peace Mission, 35, 207
- Chinese participation in, 35, 188, 190, 287–288
- joint overwater airstrike, 209–211
- Mission Action-2013C, 209–211, 224
- Shaheen series, 35

Tsai Ing-wen, 51

Tsugaru Strait, 127, 139

Tsushima Strait, 220

Turkey, 35

Uganda, 29

Uighurs, 31, 37–38, 268–269

United Arab Emirates, 279, 280

United Kingdom, 278, 279

United Nations
  Mine Action Coordination Center, 251
  Peacekeeping Capability Readiness System, 243, 245, 251
  Standby Arrangement System, 242–243
  Strategic Force Generation and Capability Planning Cell, 243

UN-African Mission in Darfur (UNAMID), 239–240, 242

UN Interim Force in Lebanon, 239–240

UN Mission in South Sudan (UNMISS), 239–240, 241, 253, 270–271

UN Organization Stabilization Mission in the Democratic Republic of Congo, 239–240

United Nations peacekeeping missions (PKOs)
  assignments of Chinese personnel, 238–239, 240, 244–245
  Chinese benefits of involvement in, 27, 39, 187, 235–237, 243–255
  Chinese permanent standby force for, 37, 236, 242–245, 251, 252, 253–254
  deployment of Chinese infantry units to, 240–241, 245, 270–271
  and development of Chinese expeditionary planning skills, 249–250, 252–253
  and improvement of Chinese counterterrorism capabilities, 247, 252–253
  and improvement of Chinese emergency response capabilities, 247, 251–252, 253
  numbers of Chinese troops involved, 27, 235, 237, 244, 253–254
  PLA participation in, 14–15, 37, 109–110, 187, 189, 235–255, 273
  potential Chinses influence on the use of, 252–253
  predeployment training for Chinese personnel assigned to, 239

U.S. Africa Command, 94, 273, 278

U.S. Army, 24

U.S.-China Economic and Security Review Commission, 219

U.S. Defense Intelligence Agency, 130, 132, 222–223

U.S. Department of Defense, on Guam as a Chinese target, 219–220

U.S. National Defense University
  Center for the Study of Chinese Military Affairs, 274
  China Military Diplomacy Database, 268

Unrestricted Warfare, 297

Van Oudenaren, John, 267–268

Victor, Jonah, 8, 11, 15

Vietnam, 140, 187, 188, 191, 206, 220

Wang Daheng, 314

Wang Fengzhong, 58–59

Wang Ganchang, 314

Wang Jinlong, Major General, 267, 268

Wang Lei, 272

Wang Mingliang, 210–211

Wang Mingzhi, 216

Wang Wenqing, 142

Washington Post, 190

Wei Fenghe, 137

Western Pacific, bomber training exercises in the, 214–215

Woody Island, 216, 220

Wu Shengli, Admiral, 80, 83, 88

Wuthnow, Joel, 11, 12, 14–15

Xi Jinping
and the Belt and Road Initiative, 266
"China Dream," 26
and China's role in international security affairs, 27–28
and civil-military integration, 131
commitment to expanding expeditionary capabilities, 29
and creation of a joint command system, 9
and economic investment overseas, 89
and loyalty of the PLA to the Chinese Communist Party, 107
"National Rejuvenation," 26
and need for talent development related to joint operations, 141
and participation in UN peacekeeping operations, 237, 242
and priority of information dominance, 154
and priority of maritime operations, 117
and reform of the PLA to improve its ability to win informationized wars, 107
and unresolved territorial claims, 109
Xiao Jie, 140
Xiaoming Zhang, 205–206
Xinjiang, 31, 38, 186, 268–269
Yamaguchi, Shinji, 3–4, 9–10, 11, 12, 13–14
Yang, Andrew, 5, 10, 12, 13
Yang Jiachi, 314
Yang Yong, 211
Ye Zheng, 154
Yemen, NEO operations in, 28, 31, 189
Yijiangshan Island campaign, 205–206
Yin Li, 135–136, 142
Ying-Yu Lin, 4, 10, 11–12, 15
Zambia, 283, 284
Zhang Fang, 59
Zhang Hongming, 273–274
Zhenbao Island, 187
Zheng Chongwei, 79
Zheng Junjie, 299–300
Zhengzhou, Henan Province, 61
Zhou, Enlai, 263–264
Zimbabwe, 281
ZTE, 270

No longer confined to China's land territory or its near abroad, the People's Liberation Army (PLA) is conducting increasingly complex operations farther and farther from China's continental borders. Within Asia, the PLA now regularly operates into the far reaches of the South China Sea and deep into the Western Pacific, enforcing China's territorial claims and preparing to counter U.S. intervention in a regional conflict. Beyond Asia, the PLA is present on the ground, at sea, or in military exercises with foreign partners across the Indian Ocean and into the Middle East, Africa, and Europe. Foreign militaries now regularly encounter the PLA, whether in tense incidents or friendly contacts, on their home turf and in the global commons.

Drawn from a 2019 conference jointly organized by the National Defense University, RAND, and Taiwan's Council on Advanced Policy Studies, *The PLA Beyond Borders* surveys the dimensions of Chinese operations within the Indo-Pacific region and globally. The international contributors look both at the underlying enablers of these activities, including expeditionary capabilities and logistics, command and control, and intelligence, surveillance, and reconnaissance systems, as well as new and evolving operational concepts and operational patterns. Employing different analytic lenses, they portray a reformed PLA accelerating the pace of its overseas operations and increasing its modernization not only in the traditional domains but also in space and cyber.

NDU Press