

CHINA'S FUTURE NUCLEAR SUBMARINE FORCE

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EDITED BY

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*Edited by Andrew S. Erickson, Lyle J. Goldstein,
William S. Murray, and Andrew R. Wilson*

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*Andrew S. Erickson, Lyle J. Goldstein,
William S. Murray, and Andrew R. Wilson*

Introduction

AS THE FIRST DECADE OF THE TWENTY-FIRST CENTURY draws to a close, it has become increasingly clear that the emergence of China is not a passing fad, and that China is not merely a regional power completely preoccupied with internal problems. Instead, China's growing confidence and influence around the globe, from Kazakhstan to Canada to Brazil to Zimbabwe, becomes ever more apparent. China's emergence as a global power need not be interpreted as an inherently destabilizing factor in the future international security environment, not least because of its extensive role in trading with developing states around the world. But there is an increasing need for sober assessments of China's developing military capabilities. Such objective analyses will enable responses to Beijing's new posture that are measured and deliberate, rather than reflexive and frenetic—and thus potentially wasteful or even provocative.

It is natural that China's naval modernization has been of acute interest to defense analysts recently. What makes the accelerating pace of Chinese development so fascinating is that China has not been a first-rate naval power since the fifteenth century. Indeed, during the intervening six hundred years China has witnessed more than its share of spectacular naval failures (particularly in the nineteenth century), and even more acutely, military debacles caused in part by China's fundamental weakness on its maritime

flank. China's turn to the sea is not only consistent with firm intellectual foundations put in place by Deng Xiaoping's insistence that China open up to the world, but also represents a fundamentally new and unprecedented development in modern world politics.

It is now widely recognized that submarines are the centerpiece of China's current naval strategy. Though this could change in future decades, this approach contrasts markedly with the power-projection navies, most notably the United States Navy but also the Indian navy, which are organized above all around aircraft carriers. To grasp the energy that China is now committing to undersea warfare, consider that during 2002–04 China's navy launched thirteen submarines,¹ while simultaneously undertaking the purchase of submarines from Russia on an unprecedented scale.² Indeed, China commissioned thirty-one new submarines between 1995 and 2005.³ When confronted with the facts of this obviously rapid buildup, one Chinese strategist responded with characteristic bluntness: "Please ask [President] Chen Shuibian [of Taiwan]."⁴ Indeed, diesel submarines are ideal coercive and anti-access instruments for coping with the Taiwan problem. The undersea dimension of various Taiwan scenarios is a vital component of the military balance and is rightly of intense interest to the defense analytical community in the United States and all around the Pacific. But this book is not specifically concerned with that particular scenario.

Instead, this edited volume is both more specific and simultaneously broader in its conception. It is more specific in that it focuses on a narrow and neglected sector of China's undersea force, the relatively small proportion of China's submarines that use nuclear propulsion. The last complete treatment of Chinese nuclear propulsion was published in 1993 by John Lewis and Xue Litai. Thus, the papers in this volume break considerable fresh ground regarding China's newest undersea arsenal. It should be noted, however, that this volume contains substantial new analysis and data concerning the Chinese submarine force and Chinese navy as a whole, and therefore is appropriate for readers who are not necessarily focused on Chinese nuclear propulsion. Indeed, this volume will appeal to students of Chinese grand strategy as well, because it is widely held that the trajectory of Chinese nuclear propulsion may be one of the best single indicators of whether or not China has ambitions to become a genuine global military power. With no need to surface in order to recharge batteries or any requirement for refueling, not to mention unparalleled survivability, nuclear submarines remain ideal platforms for persistent operations in far-flung sea areas. They will form an efficient means for China to project power should it choose to do so. Therefore, the direction

of China's nuclear submarine fleet bears watching by a larger community of strategists outside of naval circles, and obviously nuclear strategists as well.

China's Strategic Seapower, published over a decade ago, was a stunning research accomplishment by John Lewis and Xue Litai, and more broadly for the field of studies in Chinese military and technological development. That and other studies by these accomplished scholars remain the highest empirical standard in the field. And yet the conclusion that the successful 1988 launch of a JL-1 submarine-launched ballistic missile (SLBM) from China's first nuclear ballistic-missile submarine (SSBN) 092 signaled that "China had acquired a sea-based retaliatory capability" was premature. These authors, it seems, may have underestimated the training, doctrinal, and maintenance challenges associated with a genuinely operational nuclear submarine fleet. For example, the 092 submarine is believed to have never made a single deterrent patrol into the central Pacific.⁵ Moreover, they downplay the survivability issues that would arise if China was confronted by the antisubmarine (ASW) prowess of such modern fleets as those of Japan or the United States. If Lewis and Xue were somewhat premature in their conclusions, they did seemingly accurately predict that Chinese high command would "give sustained impetus to the development of strategic forces at sea for the long term."⁶ The present volume aspires to serve as a successor to that distinguished study.

With the launching of China's second generation of nuclear submarines—the type 093 nuclear attack submarine (SSN) in 2002 and the type 094 SSBN in 2004—a new era in China's military development has arrived. In October 2005, a conference on "China's New Nuclear Submarine Force" was convened at the U.S. Naval War College (NWC) in Newport, Rhode Island. NWC is a recognized center of excellence at the nexus of academic and policy worlds. It has been identified as a logical center for open-source analysis of Chinese naval development, because of its unique mix of regional and naval warfare specialists. In order to harness these capabilities, Rear Adm. Jacob Shuford, president of NWC, formally created the China Maritime Studies Institute (CMSI) in October 2006. The 2005 nuclear submarine conference was the first in a series of yearly conferences that will evaluate different aspects of Chinese maritime development. CMSI is particularly pleased to partner with the Naval Institute Press to publish the proceedings of these important conferences.

The 2005 conference participants, which included representatives from Fleet ASW Command, Naval Undersea Warfare Command, Navy Warfare Development Command, Third Fleet, Seventh Fleet, Submarine School, and Sandia National Laboratories, probed several areas of agreement and also

wide disagreement regarding the developing Chinese nuclear submarine force. There was broad consensus that Chinese naval modernization had accelerated with submarines as the focal point. There was additional agreement the new Chinese SSN (Type 093) significantly extended the strategic reach of the Chinese Navy. A final major area of agreement was that the 093 SSN could serve as an important indicator of China's ultimate naval ambitions, insofar as continued focus on the diesel submarine program would tend to indicate a naval strategy geared primarily for a Taiwan scenario or operations in the East Asian littoral, as opposed to expanded operations in the global oceans.

There was serious disagreement concerning the nature of the SSBN program. Many participants were dismissive of the 094 program, characterizing it as merely a "symbol" of China's great power status, with little actual strategic significance. Other participants viewed the new Chinese SSBN as a vital component of China's improving nuclear force posture. It was even suggested that Beijing might design its future naval strategy at least partially around protecting these assets in a manner similar to the Soviet "bastions" from the late Cold War era. Another important area of disagreement among participants concerned the overall trajectory of nuclear propulsion within China's navy. Some argued that these new nuclear vessels would have increasing importance, while others maintained that diesel submarines would remain the focus of the People's Liberation Army Navy (PLAN) for the foreseeable future. This book does not come to any fundamental conclusions on these important debates. Rather, it seeks to present a variety of perspectives that readers themselves are free to evaluate, so as to make their own judgments. In this regard, we believe it is noteworthy that five of the chapters draw substantially on original Chinese sources, in order to better acquaint the reader with the growing amount of military analysis that the Chinese are producing themselves.

This book has five parts: 1) the wider context for Chinese nuclear submarine development, 2) the dimensions of the new submarine capabilities, 3) a discussion of current and future PRC nuclear submarine operations, 4) an assessment of Cold War lessons for understanding the development of the PRC nuclear submarine force, and finally 5) a discussion of the implications for U.S. national security, and for the U.S. Navy in particular.

The first chapter by Rear Adm. Eric McVadon (USN, ret.) provides a detailed summary of current developments in the Chinese navy, as well as highlighting critical synergies with other new Chinese military capabilities. McVadon's analysis demonstrates the truly broad and deep nature of China's anti-access maritime strategy. He concludes that a young Chinese naval

officer "must today see the prospect, at least, of a promising career ahead as a nuclear submariner" with "esteem comparable to that of an American counterpart. That in itself is a remarkable and telling change from a few years ago." Bernard D. Cole's authoritative volume *The Great Wall at Sea* (Naval Institute Press, 2001) broadens the context further by establishing the PLAN's developmental stages and surveying its present and future goals and challenges. In his contribution to this volume, Cole concludes that "[PRC former commander Admiral] Liu Huaqing's reported strategy—to control China's adjacent seas out to the 'first island chain'—is reasonable and currently within reach. . . ." The third chapter, by long-time People's Liberation Army (PLA) watcher Paul Godwin, sets current developments firmly within reigning PLA doctrinal principles of "offshore defense" and also "active defense" within "local wars under high-tech conditions." According to Godwin, "China's new SSN fits well with the PLAN's offshore defense strategy . . . it would not be excessive for Beijing to be thinking of an SSN force in the range of twenty 093 platforms."

A second section analyzes available data concerning the capabilities of China's new nuclear submarine fleet. A submariner qualified to command nuclear submarines, NWC professor William Murray provides a comprehensive overview of PLAN submarine development. He discusses possible trade-offs between diesel and nuclear submarines, concluding that "with [air-independent propulsion] and a continuously fully charged battery, even a diesel submarine can act like a nuclear vessel, if only for a couple of hours. An AIP submarine can . . . sprint . . . to intercept and attack . . . [while retaining enough power to] creep away." Another submariner and a recent graduate of NWC with experience aboard SSBNs, Chris McConaughy, traces the rather arduous historical development of China's SSBN program, arguing that the first generations of PRC nuclear submarines should be viewed as an interim investment rather than a failure. Suggesting a looming challenge for the U.S. Navy, he observes: "If China elected to threaten a nuclear response to U.S. interference in what it considers an internal issue, U.S. commanders would presumably be forced to shift assets from defense of carriers to strategic ASW, thereby increasing the risk to [the] carriers."

Another product of student research at NWC is the paper by Shawn Cappellano-Sarver, yet another submariner with expertise in nuclear propulsion systems. Recognizing the extremely opaque nature of China's naval nuclear propulsion program, Cappellano-Sarver employs an indirect methodology of examining China's civilian nuclear program to learn about possible developments in Chinese naval nuclear propulsion. He notes,

"Various PRC articles state that the 093 has an advanced high-temperature high-efficiency reactor plant. The use of the technology gained by the civilian nuclear industry has the potential to greatly improve submarines designed and built in China." Richard D. Fisher, Jr., has long pioneered research into PLA development. His chapter offers an excellent summary of new PLAN capabilities, with an emphasis on technology transfers from Russia and other parts of the world. Fisher states that "new technologies offer enhanced capabilities, which in turn could also justify fewer submarines" for the PLAN. "But technology [e.g., land-attack cruise missiles, or LACMs] may also justify larger numbers [of SSNs, for example]."

A third section of the book delves into current and future operations by PLAN nuclear submarines. NWC Professor Peter A. Dutton, an expert on Chinese maritime legal perspectives, examines the legal and strategic implications of the November 2004 "Han incident," in which Japanese ASW forces vigorously pursued a Chinese nuclear submarine alleged to have penetrated Japanese territorial waters. Dutton credits Japan with a strategic victory in this incident and also notes "In response to the Japanese demands for a Chinese apology for the presence of the Han submarine, the PRC officially 'regretted' the intrusion, rather than moving its stance toward a broader right of transit passage." NWC professors Andrew S. Erickson and Lyle J. Goldstein evaluate Chinese writings concerning these new PLAN submarine capabilities, attempting to reveal the operational objectives of the Chinese SSN and SSBN programs. Among other findings, their research reveals that "[According to PRC writings,] . . . if [Chinese] nuclear submarines can 'break through the island chain blockade' they can conduct long-distance operations without hindrance from the enemy's airborne ASW." In the next chapter, China analysts Garth Hekler, Ed Francis, and James Mulvenon of the Defense Group, Inc., provide a path-breaking study of Chinese submarine command and control. Their overall conclusion is that "while the PLAN may recognize the effectiveness of decentralized [command, control, and communications, or] C3 for certain types of submarine missions, it appears to be seeking to create a more tightly centralized submarine C3 system by developing command automation, network centric warfare strategies, and advanced communications technologies." NWC professors Andrew S. Erickson and Andrew R. Wilson broaden the context for considering Chinese nuclear submarine operations by raising the aircraft carrier issue, asking in particular whether these capabilities are in competition for the same resources. According to Erickson and Wilson, "In fact, while submarines seem to be ascendant, the Chinese are still actively engaged with [the deck aviation] question and are

reframing the terms of the debate, [which] has been reinvigorated by recent events [e.g., the 2004 tsunami]."

A fourth section of the book probes the Cold War era for possible insights for understanding the development of China's nuclear submarine force. James Patton, retired commanding officer of a nuclear attack submarine, offers a compelling history of this dynamic weapons platform. In reflecting on China's naval trajectory, he offers, "A . . . certain conclusion to be drawn from a nation acquiring an SSN fleet is [that it is seeking] to obtain a significant degree of global maritime influence." Robert Loewenthal, former commanding officer of a U.S. Navy ballistic-missile submarine, discusses the complicated challenge of building and training an SSBN force. His assessment is that "Beijing has the resources, the access to technology, and seemingly, the will to continue to create a viable SSBN force, [but it will require] . . . a lot of experience at sea to make that force a legitimate SSBN weapons system to support a deterrent strategy." In one of the most creative contributions to this volume, naval strategist Peter Swartz of the Center for Naval Analyses looks at similarities and differences between the prospective rivalry with China and the approach of President Ronald Reagan's Maritime Strategy in dealing with the Soviet naval challenge. Among the most illuminating findings of Swartz's paper is the observation that, in contrast to consensus during the 1980s, "the cacophony of contemporary competing strategic visions will affect the nation and the U.S. Navy's approach to the PRC, the PLAN, and the emerging PLAN nuclear submarine force."

Continuing on this theme, the final three chapters all discuss implications for the U.S. Navy of China's new generation of nuclear submarines. NWC professor Toshi Yoshihara discusses possible linkages between U.S. ballistic-missile defense and the Chinese SSBN program. He argues that "for at least the next two decades, missile defense . . . will have no answer to a capable SSBN patrolling the open ocean. . . . This asymmetry in capability suggests that . . . the only effective response to a capable Chinese SSBN is the employment of traditional antisubmarine warfare assets, particularly hunter-killer nuclear attack submarines." Rear Adm. Michael McDevitt (ret.) of the Center for Naval Analyses evaluates the overall trajectory of Chinese naval strategy, concluding that it is a variant of the Soviet sea denial concept. With respect to the PLAN nuclear submarine force, his assessment is that "[The PLAN is now focused] on modern conventional submarines, [but] . . . over the long term, it is reasonable to expect the PLAN to try to master modern quieting techniques, since the vast distances in the Pacific combined with the logistic limitations of conventional submarines make nuclear powered

submarines a better weapons system." In the final chapter, NWC professor Tom Mahnken takes note of the other imperatives confronting the U.S. Navy (especially the global war on terror) and also draws attention to the rapid development of the Japanese Imperial Navy between the world wars as a possibly useful analogy when considering the Chinese naval challenge. Though he notes that PLAN submarine proficiency is difficult to gauge, he cautions: "Extrapolations from the past are, if anything, likely to understate the pace of improvement of the Chinese submarine force."

It is imperative to note that the opinions expressed in this volume are those of the authors and editors themselves and do not reflect the official policies or assessments of the U.S. Navy or any other agency of the U.S. Government. The editors wish to thank each of the respective authors for their outstanding research contributions. We are particularly proud of the two student paper contributions, as both count among the most thoughtful essays in this collection. In addition, we wish to thank the NWC leadership for its support of this endeavor, and Capt. J. R. Mathis and Amy Grubb for superb efforts to ensure the success of the 2005 conference. Finally, we appreciate the hard work of the editorial team at Naval Institute Press. As we go about developing the China Maritime Studies Institute (CMSI), we look forward to future joint efforts with Naval Institute that serve the national interest, as we grapple with the complex issues associated with China's rapid emergence as a maritime power.

May 2006

Notes

1. Jim Yardley and Thom Shanker, "Chinese Navy Buildup Gives Pentagon New Worries," *New York Times*, 8 April 2005, <http://www.nytimes.com/2005/04/08/international/asia/08china.html?ex=1270612800&en=c76dc1da37f15f20&ei=5090&partner=rssuserland>.
2. China received eight new Kilo-class diesel submarines from Russia during 2005–06.
3. Ronald O'Rourke, "China's Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress," Congressional Research Service Report for Congress, updated 29 August 2006, Order Code RL 33153; 8, www.crs.gov.
4. Interview, Shanghai, December 2005.
5. John Lewis and Xue Litai, *China's Strategic Seapower* (Stanford, Calif.: Stanford University Press, 1993), 205.
6. *Ibid.*, 230.