THE FUTURE OF CHINESE NUCLEAR POLICY AND STRATEGY

Christopher T. Yeaw, Andrew S. Erickson, and Michael S. Chase

THE DEVELOPMENT OF China's missile force has been among the most impressive and most closely watched aspects of Chinese military modernization over the past two decades. Beyond its growing and increasingly sophisticated arsenal of conventional missiles, China's nuclear modernization is focused on improving the ability of its forces to survive an adversary's first strike and making its nuclear deterrence posture more credible in a missile defense environment. At the theater level, China maintains nuclear-armed, solid-propellant, road-mobile DF-21 (CSS-5) medium-range ballistic missiles (MRBMs) as the cornerstone of its regional nuclear deterrence capability. As for its strategic nuclear capabilities, China still deploys a relatively small number of silo-based DF-5A (CSS-4 Mod 2) intercontinental ballistic missiles (ICBMs), and Beijing is moving toward a more survivable posture based on solid-fueled, roadmobile ICBMs. Indeed, both the DF-31 (CSS-10 Mod 1) and DF-31A (CSS-10 Mod 2) road-mobile ICBMs have been deployed to units within the Second Artillery Force during the past few years. The DF-31 (CSS-10 Mod 1) is capable of reaching targets throughout Europe and Asia and also parts of the northwestern United States, whereas the longer-range DF-31A (CSS 10 Mod 2) is capable of targeting almost all of the continental United States.2 In addition, China may be developing a new road-mobile ICBM that could be equipped with multiple, independently targetable reentry vehicles. China is also attempting to further diversify its nuclear forces by deploying a new submarine-launched ballistic missile and nuclear-powered ballistic missile submarine.

Along with these force modernization developments, China's nuclear deterrence strategy has evolved from what was essentially a version of "minimum deterrence," which relied on a handful of nuclear weapons to notify potential adversaries that any nuclear attack on China would elicit "assured retaliation," toward a new approach that China's 2006 Defense White Paper characterizes as requiring a "lean and effective nuclear force capable of meeting national security needs." Some Chinese scholars have described this evolving approach as "dynamic minimum deterrence," conveying that it retains key features of China's traditional strategy while adjusting it to keep pace with changes in the security environment and emerging threats. Li Bin describes

China's nuclear strategy as "counter nuclear coercion," highlighting what many Chinese scholars characterize as its long-standing emphasis on countering superpower nuclear threats. China's pursuit of "effective deterrence" is thus less a departure from its traditional "assured retaliation" approach than an effort to ensure that its "assured retaliation" strategy will be seen as credible despite challenges posed by an evolving security environment and advances in capabilities for adversary intelligence, surveillance, and reconnaissance; conventional precision strikes; and missile defense. But even this evolutionary departure from past practices is so significant that Beijing qualifies as a nuclear newcomer for the purposes of this volume.

Drawing on a variety of sources—including Chinese-language military publications, academic and technical journal articles, and military media reports, as well as unclassified US government publications on Chinese military power—we examine recent developments in Chinese nuclear strategy and force structure. Our key findings are twofold.

First, China is moving from a "minimum deterrence" posture, premised on ambiguity about its modest and vulnerable nuclear capabilities, toward a more secure second-strike deterrence posture whereby nuclear deterrence operations are integrated with conventional missile force strike operations. Nuclear forces help deter nuclear attack while contributing to escalation control in a conventional conflict. For example, in the event of a conventional conflict with another major power, it seems likely that the Second Artillery would conduct nuclear deterrence operations, such as dispersing mobile nuclear forces and attempting to send a message in order to deter the adversary not only from using nuclear weapons or coercing China with nuclear threats but also to deter the adversary from carrying out conventional strikes against targets such as China's nuclear forces, nuclear power stations, large-scale hydroelectric power facilities, and important strategic targets in and around Beijing and other major cities.

Second, China's nuclear missile force developments and the Second Artillery's evolving approach to nuclear and conventional missile force campaigns will have major implications for the United States—China strategic relationship and could lead to crisis instability under certain circumstances. In particular, although a secure second-strike capability will likely result in greater strategic stability in the long term, it may not do so immediately or automatically. Some recent developments could result in considerable instability in the event of a crisis or conflict between China and another major military power, such as the United States. China retains its long-standing nofirst-use (NFU) policy, but Chinese sources raise questions about what exactly Beijing would construe as equivalent to "first use" on the part of an adversary. Some deterrent actions discussed in Chinese publications could easily be misunderstood, possibly leading to inadvertent escalation. The principal recommendation that emerges from our findings is that dialogue on issues of mutual concern is required to mitigate these risks.

Historical Background

Throughout the Cold War, as M. Taylor Fravel and Evan Medeiros argue cogently, China was willing to accept a "striking" degree of vulnerability by developing only

a "small and (1) Mao Zed for deterrenc People's Libe nuclear strate "this situatio: nal events recally, the req have achieved "technology of nological capities and is concore objective

Following Chinese Compands of foreithe next sever in this regard, strated that it renege on its a War of 1950—that would introncluded that the nuclear prothers, we can size that China blackmail and

The PLA's fi According to a force could not constructed. The A detailed state philosophy that in the face of ev government sol cumstances be t exert every effor prohibition and

During the na Artillery Campa twelve missile r relevant schools while implement quently, China's ing at the campa

what many Chiring superpower a departure from that its "assured d by an evolving elligence, surveilsile defense.6 But that Beijing quali-

military publicareports, as well as ver—we examine ire. Our key find-

oremised on ambird a more secure erations are inteforces help deter ventional conflict. It major power, it rrence operations, a message in order ercing China with powentional strikes ations, large-scale and around Beijing

Second Artillery's mpaigns will have hip and could lead gh a secure seconde long term, it may ents could result in China and another long-standing nobout what exactly an adversary. Some be misunderstood, ommendation that concern is required

iros argue cogently, by developing only a "small and vulnerable nuclear force structure." They suggest two major reasons: (1) Mao Zedong and his successor Deng Xiaoping viewed nuclear weapons as tools for deterrence in the form of "assured retaliation," not war fighting; and (2) the People's Liberation Army (PLA) lacked "experience and expertise" to "develop nuclear strategy and an associated operational doctrine." Subsequently, however, "this situation evolved as expertise and attention to nuclear issues grew and as external events required China's response. This change led China to examine, systematically, the requirements of a credible second-strike capability, which it appears to have achieved." To these factors, we add a third. As Dennis Blasko emphasizes, "technology determines doctrine" in China's case. In Initially, China lacked the technological capabilities to achieve assured retaliation; it now possesses such capabilities and is constantly improving its arsenal to ensure that it continues to meet this core objective.

Following the establishment of the People's Republic of China in 1949, the ruling Chinese Communist Party was determined to end a century of humiliation at the hands of foreigners and the consequent compromise of China's autonomy. During the next several years, important events underscored the value of nuclear weapons in this regard. The USSR, which had conducted its first nuclear test in 1949, demonstrated that it was an increasingly unreliable security partner, and it would later renege on its alleged promises to provide China with a nuclear weapon. The Korean War of 1950–53 subjected China for the first time to US nuclear threats, a challenge that would intensify in the Taiwan Strait crises of 1954–58. By the mid-1950s Mao concluded that China needed nuclear weapons to prevent bullying or coercion by the nuclear powers: "In today's world, to ensure that we will not be bullied by others, we cannot but possess this thing." Similarly, Chinese authors often emphasize that China was compelled to develop nuclear weapons in response to "nuclear blackmail and nuclear threats," or to counter nuclear coercion.

The PLA's first ground-to-ground missile force unit was established in July 1959. According to a Chinese source, "at that time, there were only three battalions; the force could not conduct campaign training." In June 1964, the first missile base was constructed. Then, on October 16, 1964, China detonated its first nuclear weapon. A detailed statement issued later that day revealed central tenets of Beijing's nuclear philosophy that persist to this day in official statements: "China cannot remain idle in the face of ever-increasing nuclear threats from the United States. . . . The Chinese government solemnly declares that China will never at any time or under any circumstances be the first to use nuclear weapons. . . . The Chinese government will . . . exert every effort to promote, through international consultations, the . . . complete prohibition and thorough destruction of nuclear weapons." 13

During the next two years, notes the authoritative volume *The Science of Second Artillery Campaigns* (hereafter, SSAC), the PLA established six missile bases and twelve missile regiments, but "each missile regiment was managed separately by relevant schools and academies and the artillery forces in the military area command while implementing separate missile technology and tactical training." Consequently, China's nascent missile force "did not have the capability to conduct training at the campaign level." 14

In July 1966 the Second Artillery Force was created, "signifying that the establishment and development of the missile forces had entered an important phase." Each missile regiment was formally incorporated into one of the corresponding missile bases and implemented relevant technical and tactical training, thus establishing the necessary foundation for campaign training. On June 17, 1967, China tested its first hydrogen bomb. 16

Although the establishment of the Second Artillery Force represented an important development from an organizational perspective, China still lacked an effective retaliatory nuclear strike capability. According to an article written by a professor at the Second Artillery Command College, because China "did not possess effective means of secondary nuclear strikes," its deterrent posture during this period was basically one of "existential nuclear deterrence." The development and deployment of nuclear-capable ballistic missiles of gradually increasing ranges proved to be a tortuous process. The first major achievement came in September 1966, when China deployed its first nuclear-armed ballistic missile, the roughly 1,000-kilometerrange DF-2 (CSS-1) MRBM. The DF-3 (CSS-2) intermediate-range ballistic missile (IRBM) followed in May 1971. These missiles gave China at least some ability to strike regional targets, but even after the deployment of the DF-4 (CSS-3) long-range ballistic missile in 1980 brought targets as far away as Moscow and Guam within range of China's nuclear forces, China still lacked a nuclear delivery system capable of reaching the continental United States.¹⁸

China also lacked an explicitly articulated nuclear strategy. Intellectual development lagged hardware, as is often the case with nuclear newcomers. The relative immaturity of China's nuclear strategy and doctrine was a consequence of the constraints imposed by adherence to Mao's military theories, the domestic tumult of the Cultural Revolution, and the limitations of Chinese nuclear warhead and ballistic missile technology.¹⁹

Thus it was not until the early 1980s that changes in the political situation and advances in the Second Artillery's nuclear force capabilities finally enabled China to begin thinking seriously about articulating a nuclear strategy. Chinese strategists soon began deliberating about moving beyond "existential nuclear deterrence." In terms of nuclear capability, one event that made this transition possible was the August 1981 deployment of China's first ICBM, the DF-5, albeit only in two silos. As China's nuclear capability gradually increased, its nuclear strategy and doctrine also began to evolve in a more sophisticated direction. Even as China maintained its nuclear policy, including its commitment to NFU, and its focus on "assured retaliation" remained relatively unchanged, its nuclear deterrence strategy underwent considerable development after the beginning of the reform and opening period.

During the past thirty years, according to an article by Zhao Zekuan, a professor at the Second Artillery Command Academy, China's force structure developments to support its nuclear deterrence strategy have progressed through three distinct stages.²¹ The first, which took place under Deng's leadership, was "minimum nuclear deterrence." In November 1983 Deng declared: "We have some nuclear weapons, . . . so if you want to destroy us, you will face some retaliation." The key characteristics of this approach were "limited development," "being streamlined

and effective this period heavily on t China's abi work on an e only four of 1990s.²³

The secon in which nucleon posture, an a third-general key objective also encompana's approact countries por The main of period were "combining would "not countries to the second period were "combining would "not countries to the second period were "combining would "not countries to the second posture to th

Although approach, the tance of othe Indeed, one of the Second A conventional tional mission assign operations" (which emphasiventional and

China's fir Within a few y front of its co crisis, the conrence firing exnese observers deterred Taiwa

The third, materialized us upon thinking that "meets th able," and "stu has been the c and 2007, resp assumed respons

g that the estabiportant phase." rresponding misthus establishing 67, China tested

sented an imporcked an effective in by a professor possess effective this period was nent and deployranges proved to nber 1966, when 1,000-kilometerballistic missile st some ability to CSS-3) long-range and Guam within ry system capable

rellectual developners. The relative quence of the conomestic tumult of arhead and ballis-

tical situation and / enabled China to Chinese strategists ir deterrence."²⁰ In 1 possible was the t only in two silos. ategy and doctrine nina maintained its in "assured retaliagy underwent conning period.

Zekuan, a professor cture developments ough three distinct p, was "minimum have some nuclear staliation." The key "being streamlined and effective," and "you will face some retaliation if you try to destroy us."²² During this period China's nuclear retaliatory capability was extremely limited and relied heavily on uncertainty about numbers and locations to deter an enemy first strike. China's ability to strike more distant targets remained highly limited. Although work on an extended-range variant of the DF-5, the DF-5A, began in the mid-1980s, only four of the 13,000-kilometer-range DF-5As were deployed in silos by the early 1990s.²³

The second stage in the evolution of China's post-Mao nuclear strategy was one in which nuclear forces were seen as contributing to a broader strategic deterrence posture, an approach articulated during Jiang Zemin's tenure as the core of China's third-generation senior leadership group. Strengthening nuclear deterrence was one key objective, but it was part of a much wider concept of strategic deterrence, which also encompassed many other types of capabilities.²⁴ Jiang Zemin encapsulated China's approach by saying, "Our possession of such power is a great deterrence for countries possessing nuclear weapons, so that they will not dare to act recklessly." The main characteristics of China's approach to nuclear deterrence during this period were "taking nuclear weapons as the core power of strategic deterrence," "combining multiple means of deterrence," and ensuring that hostile countries would "not dare to act recklessly."

Although enhancing nuclear deterrence was clearly an important part of this approach, the phrase "combination of multiple means" underscored the importance of other types of forces and capabilities, including conventional missiles. Indeed, one of the key developments during this period was the establishment of the Second Artillery Force's conventional missile force. It began forming its first conventional missile unit in August 1991 and formally established its first conventional missile brigade in April 1993.²⁶ That year,²⁷ the Central Military Commission assigned the Second Artillery the task of "dual deterrence and dual operations" (双重威慑, 双重作战, shuangzhong weishe, shuangzhong zuozhan),²⁸ which emphasizes the importance of deterrence and combat roles for both the conventional and nuclear missile forces.²⁹

China's first conventional ballistic missile force unit was established in 1993. Within a few years China's nascent conventional missile capability reached the forefront of its coercive diplomacy toward Taiwan. During the 1995–96 Taiwan Strait crisis, the conventional missile force conducted two "large-scale conventional deterrence firing exercises," known as "Magic Arrow-95" and "Joint 96–1." Some Chinese observers evaluate the missile launches as a successful display of force that deterred Taiwan from moving further toward formal independence.

The third, current stage of China's post-1978 nuclear deterrence posture has materialized under Hu Jintao's leadership. The main feature of this era, which builds upon thinking that dated back to the 1980s, is its emphasis on nuclear deterrence that "meets the needs of national security" and is "development oriented," "reliable," and "strong." One of the most important developments during this period has been the deployment of the road-mobile DF-31 and DF-31A ICBMs in 2006 and 2007, respectively. Another key development, since the Second Artillery Force assumed responsibility for it in 1993, has been the rapid growth of the conventional

missile force. Although the development of this force is beyond the scope of this chapter, it must be noted that this force has given China a potent new capability to conduct regional strikes, either independently or as part of a joint campaign. Indeed, according to SSAC, "During future joint combat operations the Second Artillery will not merely act as the main force in providing nuclear deterrence and nuclear counterstrike power, but will also act as the backbone force in conventional fire-power assaults."³²

China's Current Nuclear Strategy

China's 2006 Defense White Paper, the most authoritative public statement of how Beijing views the security environment and proper strategic responses to it, provided the first official explanation of China's nuclear strategy. It summarizes the key elements of China's approach to nuclear weapons as follows:

China's nuclear strategy is subject to the state's nuclear policy and military strategy. Its fundamental goal is to deter other countries from using or threatening to use nuclear weapons against China. China remains firmly committed to the policy of no first use of nuclear weapons at any time and under any circumstances. It unconditionally undertakes not to use or threaten to use nuclear weapons against non–nuclear weapon states or nuclear-weapon-free zones, and stands for the comprehensive prohibition and complete elimination of nuclear weapons. China upholds the principles of counterattack in self-defense and limited development of nuclear weapons, and aims at building a lean and effective nuclear force capable of meeting national security needs. It endeavors to ensure the security and reliability of its nuclear weapons and maintains a credible nuclear deterrent force. China's nuclear force is under the direct command of the Central Military Commission (CMC). China exercises great restraint in developing its nuclear force. It has never entered into and will never enter into a nuclear arms race with any other country.³³

The doctrinal underpinnings of this approach were outlined in the 1987 edition of *The Science of Strategy (Zhanlüexue)*, which outlines the mission of the nuclear missile force as follows: "In peacetime, the mission of the Second Artillery is to bring nuclear deterrence into play, so as to deter enemies from launching a nuclear war against China, and to support China's peaceful foreign policy. . . . In wartime, the strategic mission is to prevent conventional war from escalating into nuclear war, and to contain the escalation of nuclear war; and—if China suffers the enemy's nuclear attack—to conduct a nuclear counterattack, striking the enemy's strategic targets and weakening its war potential and strategic attack forces."³⁴

A variety of authoritative publications on missile force campaigns and nuclear deterrence that have been published during the past decade shed further light on China's nuclear strategy. For example, the editors of the 2001 edition of *The Science of Strategy*, published by the PLA's Academy of Military Science, divide nuclear deterrence strategies and postures into three categories: "maximum deterrence,"

"minimum
"effective de
evolve in res
adversaries,
rence." The
"medium-sti
force to thre
tain extent si
note that "th
ciency and i
nuclear strat
retaliation."

One quest enemy action suggest that enemy from t strategic conv

> Deterring t weapons to tional war out a conve age; and to major, strat The demon quence of it enemy to cl the war to a

This illustr: weapons as a 'ing to the auth nuclear weapo tries and they under informatione is able to a informatized, chigh the price operations."40

Nuclear det deterring both ing to SSAC, "' nuclear counter and counter—nu ond the scope of this tent new capability to int campaign. Indeed, the Second Artillery eterrence and nuclear in conventional fire-

iblic statement of how sponses to it, provided immarizes the key ele-

ry and military strating or threatening to mitted to the policy any circumstances. It dear weapons against d stands for the comear weapons. China mited development of nuclear force capable security and reliabiliterent force. China's Military Commission ear force. It has never h any other country.³³

ned in the 1987 edition e mission of the nuclear cond Artillery is to bring aunching a nuclear war icy. . . . In wartime, the lating into nuclear war, tina suffers the enemy's ng the enemy's strategic forces."³⁴

campaigns and nuclear de shed further light on 2001 edition of *The Sci*ry Science, divide nuclear 'maximum deterrence,' "minimum deterrence," and "medium strength deterrence." China's concept of "effective deterrence," which is based on an assured retaliation capability that must evolve in response to changes in the offensive and defensive capabilities of potential adversaries, appears most similar to the concept of "medium strength nuclear deterrence." The volume's editors, Peng Guangqian and Yao Youzhi, indicate that "medium-strength" deterrence requires "sufficient and effective' nuclear strike force to threaten an opponent by imposing on him unbearable destruction to a certain extent so as to attain one's deterrent objective." Indeed, Fravel and Medeiros note that "this definition—especially the explicit reference to the concepts of sufficiency and effectiveness—strongly resembles PLA descriptions of China's own nuclear strategy and is consistent with the concept of deterrence through assured retaliation." 37

One question that some of these newly available sources address is what types of enemy actions China believes its nuclear capability can help deter. These sources suggest that Chinese strategists expect nuclear deterrence not only to prevent an enemy from using nuclear weapons against China but also to deter certain types of strategic conventional attacks. According to SSAC:

Deterring the escalation of warfare refers primarily to the application of nuclear weapons to carry out active and passive deterrence, in order to prevent a conventional war from escalating into a nuclear war; to prevent the enemy from carrying out a conventional strike against our nuclear facilities and creating nuclear leakage; and to prevent the enemy from causing unbearably tremendous losses to our major, strategic facilities through medium and high-powered air raids against us. The demonstration of power causes the enemy to dread that the possible consequence of its actions will be that its losses will exceed its gains, thereby causing the enemy to change its plans for risky activities and achieving the goal of restricting the war to a certain scope.³⁸

This illustrates one of the ways in which the editors of the volume view nuclear weapons as a "backstop to support conventional operations." Specifically, according to the authors of SSAC, "From the perspective of international strategic patterns, nuclear weapons are a strong nuclear backstop for ensuring the status of large countries and they are a potentially huge deterring resource. In local conventional wars under informatized conditions, just by moderately revealing one's nuclear strength, one is able to apply many types of deterrent methods flexibly. An enemy that is using informatized, conventional air raids against us cannot but consider prudently how high the price might be, thereby achieving the goal of supporting conventional operations."

Nuclear deterrence thus plays an important role during conventional conflicts in deterring both nuclear attack and certain types of conventional escalation. According to SSAC, "Second Artillery nuclear missile units are the main forces involved in nuclear counterstrikes, and are mainly responsible for important nuclear deterrent and counter-nuclear deterrent duties during joint campaigns."⁴¹

Chinese doctrinal publications like SSAC continue to reflect the official NFU policy, as outlined in other books, articles, and official documents like China's National Defense White Papers, in that they assume the Second Artillery nuclear forces would launch their weapons only after an enemy first strike. For example, SSAC indicates that Chinese missile forces would have to conduct nuclear counterstrikes after suffering heavy damage from an enemy nuclear attack:

Based on the principle that our country will not be the first to use nuclear weapons under any circumstances, the strategic nuclear forces of the Second Artillery will implement nuclear counterattacks only after the enemy has carried out nuclear attacks against China, and only in accordance with the orders of the supreme command. Therefore, as a whole, nuclear counterattack campaigns will be implemented under nuclear conditions. If the enemy launches nuclear attacks against our country, it will definitely treat the operational positions and nuclear missile weapon systems of the Second Artillery as its key targets. After Second Artillery operational areas suffer such attacks, the battlefield situation becomes very complex and the environment extremely harsh. Our personnel, weapons and equipment, battle positions, roads and bridges, and reconnaissance, communications, and command and control systems will suffer serious damage and destruction. The nuclear counterattack campaign of the Second Artillery will have to be implemented under very difficult conditions.⁴²

This is also consistent with the writings of Chinese scholars who assert that China will continue to adhere to a NFU policy. Major General Yao Yunzhu, a senior researcher at the PLA Academy of Military Science who serves on the Defense White Paper drafting team, emphasizes that "no first use . . . has been most frequently and consistently repeated in numerous Chinese government statements ever since China became a nuclear weapon state in 1964." She adds: "The most important element of China's nuclear policy is renunciation of the first-use option." Rong Yu and Peng Guangqian elaborate that "although some people believe China's NFU policy is not credible, China has never wavered from its promise during the past 40 years." Rong and Peng see the NFU policy as a stabilizing factor in crisis situations and as "conducive to escalation control."

Nonetheless, interviews and a variety of publications suggest that Chinese strategists continue to debate matters of nuclear policy. Among the issues that reportedly have been under discussion at various points during the past decade are the merits of continuing to adhere to this NFU policy. Indeed, some Chinese strategists have argued that the NFU policy is an unnecessary, self-imposed strategic constraint. Chinese analysts have considered at least three scenarios under which Beijing might consider discarding the traditional NFU policy. The first is under the wartime condition of retaliation for conventional strikes on strategic or nuclear targets and facilities. Here it is useful to examine *Intimidation Warfare* (hereafter, *IW*)—edited by Lieutenant General Zhao Xijun, the Second Artillery Force's deputy commander from 1996 to 2003—which echoes many of the statements outlined in *SSAC* and sheds additional light on China's possible calculus and tactics in various scenarios.

According ens to carr strategic to and to arre nuclear we

The secinterventio suggested t vention in : cate a shift and it is sep *Art*, one of circumstance even lower enemies."48

The third stake. Some particularly of suffering Taiwan. And in the milita acteristics of threat of use

Other po times be nece enemy from nuclear facil cities, or to a quoting at les

Reducing 1 a militarily absolute su strength co side lacks a follow the a in a timely enemy in o tional air r moments for when an er facilities (or disastrous 1 the enemy a ing the enem

ect the official NFU polits like China's National ery nuclear forces would example, SSAC indicates counterstrikes after suf-

o use nuclear weapons e Second Artillery will as carried out nuclear orders of the supreme mpaigns will be implenuclear attacks against ins and nuclear missile. After Second Artillery ion becomes very comil, weapons and equipance, communications, ge and destruction. The will have to be imple-

scholars who assert that eral Yao Yunzhu, a senior rves on the Defense White been most frequently and atements ever since China e most important element option."⁴⁴ Rong Yu and elieve China's NFU policy mise during the past 40 g factor in crisis situations

uggest that Chinese strate-5 the issues that reportedly past decade are the merits 6 Chinese strategists have 6 strategic constraint. Chimder which Beijing might 7 s under the wartime condi-7 nuclear targets and facili-7 (hereafter, IW)—edited by 7 orce's deputy commander 8 ents outlined in SSAC and 8 actics in various scenarios. According to the now-retired Zhao, "In a conventional war, when the enemy threatens to carry out conventional strikes against one's nuclear facilities or other major strategic targets, in order to protect the nuclear facilities, prevent nuclear leakage, and to arrest the escalation of conventional war to nuclear war, one should employ nuclear weapons to actively carry out nuclear deterrence against the enemy."⁴⁷

The second possibility occurs under the much more likely condition of external intervention in a high-intensity crisis or conflict. Specifically, Chinese authors have suggested that Beijing could "lower the nuclear threshold" to deter US military intervention in a Taiwan scenario. This lowering of the nuclear threshold seems to indicate a shift in the declaratory policy to something less restrictive than no first use, and it is separate from elevation of the alert level. According to an article in *Military Art*, one of the PLA's most important journals, "When we are under the pressure of circumstances to use military force to reunify the motherland's territory, we may even lower the threshold of using nuclear weapons to deter intervention by external enemies."⁴⁸

The third scenario is when Chinese leaders believe that territorial integrity is at stake. Some Chinese strategists seem to indicate the possibility of first use under particularly dire circumstances, such as a scenario in which the PLA is on the verge of suffering a politically catastrophic defeat in a conventional military conflict over Taiwan. And as Zhao summarizes: "Of course, there are quite a number of scholars in the military academic theoretical community of China, who—based on the characteristics of modern high-tech warfare—are studying the issue of the conditional threat of use of nuclear weapons."

Other portions of SSAC envision similar conditions under which it may sometimes be necessary to adjust nuclear policy or lower the nuclear threshold to deter an enemy from launching conventional attacks against strategic targets such as Chinese nuclear facilities, dams, or electrical infrastructure, or the capital or other major cities, or to avert catastrophic conventional defeat. The relevant passage is worth quoting at length:

Reducing the nuclear deterrence threshold refers to the following situation: when a militarily powerful country armed with nuclear missiles and depending on its absolute superiority in high tech conventional weapons carries out medium or high strength continuous air raids against our major strategic targets, and when our side lacks a good plan for resisting the enemy, the nuclear missile forces should follow the orders of the supreme command, adjust their nuclear deterrence policies in a timely fashion, and actively carry out powerful nuclear deterrence against the enemy in order to deter the strong enemy from continuously carrying out conventional air raids against our major strategic targets. The following are opportune moments for nuclear missile units to reduce the nuclear deterrence threshold. First, when an enemy threatens to carry out conventional strikes against our nuclear facilities (or nuclear power stations), in order to prevent the creation of large-scale, disastrous nuclear leakage, one's own nuclear missile units must sharply oppose the enemy and use nuclear missiles to carry out effective deterrence, thus restraining the enemy from carrying out its scheme of using conventional air raids against

our nuclear facilities. Second, when an enemy threatens to carry out conventional strikes against our major strategic targets related to the safety of the people, like large-scale hydroelectric power stations, one should adhere to the deterrence orders of the supreme command and threaten to use nuclear missiles against the enemy in order to ensure the absolute security of our major strategic targets. Third, when an enemy threatens to carry out medium or high strength conventional strikes against our capital, important major cities, and other political and economic centers, the nuclear missile units should follow the orders of the supreme command and resolutely issue threats of the use of nuclear weapons to the enemy. This should be done in order to achieve the goal of reducing the strength of the enemy's air raids or deterring the enemy from carrying out air strikes. Fourth, when conventional warfare continues to escalate and the overall strategic situation is extremely unfavorable for us, and when national security and survival are seriously threatened, in order to force the enemy to stop its war of invasion and save the country from danger, the nuclear missile units should follow the orders of the supreme command and carry out effective nuclear deterrence against the enemy.50

The specific methods and means for "reducing the nuclear threshold" under any of the above-noted circumstances may include launch exercises and warnings disseminated though the media. The purpose is to shake the enemy psychologically and "conquer the enemy without fighting." Accordingly, depending upon the level of threat presented by the enemy, it may even be necessary to "disseminate the aim points at which [China's] nuclear missiles are aiming." A reduction in the nuclear deterrence threshold may also include changing the declaratory nuclear policy. 53

Chinese strategists also suggest that there is some ambiguity when it comes to determining what constitutes first use by an adversary. As two such commentators state, "establishing definitely whether the adversary has broken the nuclear threshold is not necessarily a straightforward issue," because conventional attacks may have equally devastating effects in certain cases. Specifically, they raise the question of whether a conventional attack on a country's nuclear forces could be considered tantamount to the first use of nuclear weapons. "On the surface, this is merely a conventional attack," they write, "but in effect, its impact is little different from suffering a nuclear strike and incurring similarly heavy losses." The result could be that the conventional attack would "be seen as breaking the nuclear threshold," with the result that the party suffering the attack "will find it difficult to refrain from a nuclear counterattack."54 Chinese strategists have made similar comments with reference to conventional strikes against China's strategic command-and-control structure.55 As Fravel and Medeiros point out, "Whether intended or not, the existence of such a debate generates increased ambiguity about the conditions under which China might use nuclear weapons, thereby strengthening China's deterrent."56

These statements highlight conditions under which China's NFU policy might face considerable pressure, or perhaps might not apply if China judges an adversary's actions as in some way equivalent to a nuclear first strike. Nonetheless, it

seems that this debat NFU policy. This is r "China consistently to a self-defensive nu with any other count may not represent the seven years old. Indee actual decision to autil such a decision woull example, Rong and Pethe decision to use m interests are in peril, Chinese sources under highest-level political is authorized to make

nuclear missile force ce ally, the PLA defines a composed of nuclear st tion of the Second Art command in order to a Other services are env counterattack campaig their main component, the nuclear forces of a nuclear counterattack of ing, in that China's

Consistent with the N

coordinate with the oth Publications like SSA sist of both initial nucl strategists indicate that number of waves of nuc strikes could consist of initial nuclear strike, or amount of pressure and

"SSBNs"), are not yet

bombers maintain a nuc

gists envision a requirer

Such a complex conc ventional wisdom regard

irry out conventional ty of the people, like re to the deterrence r missiles against the rategic targets. Third, trength conventional ter political and ecorders of the supreme reapons to the enemy. ig the strength of the it air strikes. Fourth, rall strategic situation and survival are seriof invasion and save llow the orders of the 2 against the enemy.50

ir threshold" under any cises and warnings dismy psychologically and nding upon the level of o "disseminate the aim reduction in the nuclear ory nuclear policy.53 guity when it comes to wo such commentators sken the nuclear threshnventional attacks may lly, they raise the quesar forces could be con-'On the surface, this is ts impact is little differeavy losses." The result s breaking the nuclear ck "will find it difficult gists have made similar inst China's strategic s point out, "Whether es increased ambiguity :lear weapons, thereby

ina's NFU policy might China judges an advert strike. Nonetheless, it seems that this debate has ended, at least for now, with a decision to maintain the NFU policy. This is reflected by China's 2010 Defense White Paper, which states: "China consistently upholds the policy of no first use of nuclear weapons, adheres to a self-defensive nuclear strategy, and will never enter into a nuclear arms race with any other country." SSAC and IW were clearly part of this debate; but they may not represent the last word on the subject, because they are now more than seven years old. Indeed, Chinese scholars suggest that Beijing would approach any actual decision to authorize the use of nuclear weapons with great caution, and that such a decision would only be made under the most extreme circumstances. For example, Rong and Peng state that given the immense damage that would be caused, the decision to use nuclear weapons would be "only imaginable if core national interests are in peril, such as the survival of the state or nation." Furthermore, Chinese sources underscore that only the "supreme command" (tongshuaibu), the highest-level political and military leadership and likely a highly deliberative body, is authorized to make a decision about the employment of nuclear weapons.

Nuclear Counterstrike Campaigns

Consistent with the NFU pledge, the nuclear counterstrike campaign is the only nuclear missile force campaign outlined in Chinese military publications.60 Doctrinally, the PLA defines a nuclear counterstrike campaign as "the operational action composed of nuclear strikes that is implemented by the nuclear missile large formation of the Second Artillery based on the uniform planning and highly centralized command in order to achieve specific strategic goals or strategic campaign goals."61 Other services are envisioned as participating in strikes as follows: "Joint nuclear counterattack campaigns usually take the nuclear forces of the Second Artillery as their main component, with the nuclear forces of the navy's nuclear submarines and the nuclear forces of the air force's bomber units unifying three dimensions of nuclear counterattack operational activities."62 This passage is somewhat perplexing, in that China's nuclear-powered ballistic missile submarines (known as "SSBNs"), are not yet operationally deployed, and it is unclear whether China's bombers maintain a nuclear strike role, but it appears to indicate that Chinese strategists envision a requirement for the nuclear missile forces of the Second Artillery to coordinate with the other services.

Publications like SSAC indicate that nuclear counterattack campaigns could consist of both initial nuclear strikes and follow-on nuclear attacks. Indeed, Chinese strategists indicate that the Second Artillery should be capable of "carrying out a number of waves of nuclear missile strikes after initial nuclear strikes." Follow-on strikes could consist of repeat strikes against targets that were not destroyed by the initial nuclear strike, or they could be carried out "in order to maintain the huge amount of pressure and psychological fear against the enemy."

Such a complex concept of nuclear warfare appears to be at odds with the conventional wisdom regarding Chinese concepts of nuclear counterattack as consisting

mainly of countervalue retaliatory strikes designed solely to inflict punishment, and thus to deter the outbreak of nuclear war in the first place.

Chinese military publications also offer some insight into how Chinese strategists think about questions of nuclear targeting. The targeting strategy for the nuclear counterattack campaign has as its core the mission of "carrying out missile strikes on the enemy's important strategic and campaign targets, in accordance with the intentions of higher levels, in order to frustrate the enemy's strategic plans, shake the enemy's will, cripple the enemy's command systems, retard the enemy's warfare activities, weaken the enemy's warfare potential, and prevent an escalation of nuclear warfare." Under the guiding ideology of "integrated deterrence and warfare and focused strikes," targeting aims at "vital targets" in order to [make an impact on] everything by striking one point, and paying a small price to achieve a large victory." Again the concept of escalation control comes into view, and this guides much of the targeting, for "correctly selecting the targets for striking the focal point is a precondition for carrying out the ideology of focused strikes." Striking at the focal point is aimed at "stopping the enemy at the first opportunity." Targeting is designed to bring swift victory at minimal cost.

Categories of targets parallel in many respects the traditional targeting categories in the United States and Russia. Target categories include strategic weapon bases, strategic rear-area bases, military command headquarters, political and economic centers, heavy industry facilities, transportation and communication nexuses, and heavy military industry groups.⁶⁷ The selection of targets in the execution phase must be very deliberate so as to achieve just the right psychological effect upon the adversary: "The target must be reasonable and the deterrence not to be too high that the enemy cannot accept it and cause the deterrence to fail, or even to drive it to the extreme and not to be deterred. It should not be too low, either, as it will make the enemy have no feel of the deterrence and the objective of deterrence unable to be achieved." Additionally, there seems to be a very rational process within the Second Artillery Force whereby weapons are allocated to targets according to various factors such as range, reaction time, penetration capability, yield ("destruction capabilities of various models of warheads"), missile inventory, and reserve force requirements.⁶⁸

China's Nuclear Missile Force Capabilities

Backstopping the PLA's growing arsenal of short-range and theater conventional missiles are its theater and strategic nuclear missile forces, which provide the ultimate escalatory or counterescalatory threat. In addition to its theater nuclear capabilities and silo-based ICBMs, the deployment of the road-mobile DF-31 and DF-31A ICBMs and the development of the JL-2 submarine-launched ballistic missile (SLBM) are enhancing the survivability of China's once highly vulnerable strategic missile force. In addition, China may be able to create a nuclear triad by deploying nuclear-armed air-launched cruise missiles aboard PLA Air Force

(PLAAF) torce will i

Nuclear N

China c
Mod 1 and
DF-3 (CSS
a maximu
National A
is "transpo
liquid-fuele
observers e
China h
nuclear for
the 2009 N
PLA has fe

Intercontin

CSS-5 Mod

solid-prope

kilometers (

The silostage missile force since silo-based I kilometers (nental Unite years that C. multiple, inc official state. DF-5, but re aerospace ir recent years.

Convertir would dram against "soft continental I talk increasir existing silocould result i China capabl cussed emplo

inflict punishment, and

how Chinese strategists trategy for the nuclear ying out missile strikes in accordance with the s strategic plans, shake and the enemy's warfare event an escalation of ed deterrence and ward in order to [make an small price to achieve a mes into view, and this gets for striking the focal ised strikes." Striking at pportunity."66 Targeting

onal targeting categories strategic weapon bases, political and economic nunication nexuses, and in the execution phase hological effect upon the tence not to be too high o fail, or even to drive it oo low, either, as it will rtive of deterrence unable tional process within the targets according to varibility, yield ("destruction entory, and reserve force

abilities

and theater conventional s, which provide the ultio its theater nuclear caparoad-mobile DF-31 and ine-launched ballistic mise highly vulnerable stratecreate a nuclear triad by aboard PLA Air Force

(PLAAF) bombers, though it appears that the Second Artillery's land-based nuclear force will remain the core of China's deterrent capability for the foreseeable future.⁶⁹

Nuclear MRBMs and IRBMs

China currently deploys the DF-3 (CSS-2) IRBM and DF-21 and DF-21A (CSS-5 Mod 1 and CSS-5 Mod 2) MRBMs for regional nuclear deterrence missions. ⁷⁰ The DF-3 (CSS-2), first deployed in 1971, is a single-stage, liquid-propellant IRBM with a maximum range of about 3,000 kilometers (1,900 miles). The US Air Force National Air and Space Intelligence Center (NASIC) estimates that the DF-3 (CSS-2) is "transportable" but has "limited mobility." China has about fourteen to eighteen liquid-fueled DF-3 (CSS-2) IRBMs and about five to ten CSS-2 launchers. ⁷¹ Many observers expect the DF-3 (CSS-2) IRBMs to be retired from service soon. ⁷²

China has been making the transition to a more survivable, road-mobile theater nuclear force featuring the CSS-5 Mod 1 and CSS-5 Mod 2 MRBMs. According to the 2009 NASIC report on foreign ballistic missile and cruise missile systems, the PLA has fewer than fifty launchers each for its nuclear-armed CSS-5 Mod 1 and CSS-5 Mod 2 MRBMs.⁷³ The CSS-5 Mod 1 and CSS-5 Mod 2 are both two-stage, solid-propellant, road-mobile missiles with maximum ranges of more than 1,750 kilometers (more than 1,100 miles).⁷⁴

Intercontinental Ballistic Missiles

The silo-based DF-5 (NATO designator CSS-4) ICBM—a liquid-propellant, two-stage missile—has been the mainstay of China's intercontinental nuclear deterrence force since its initial deployment in 1981. China currently deploys about twenty silo-based DF-5A (CSS-4 Mod 2) ICBMs, which have a range of at least 13,000 kilometers (more than 8,000 miles), enough to strike targets throughout the continental United States.⁷⁵ The US intelligence community has judged for a number of years that China is capable of deploying a version of the DF-5 ICBM equipped with multiple, independently targetable reentry vehicles (MIRVs).⁷⁶ China has made no official statements regarding whether it intends to deploy a MIRVed version of the DF-5, but researchers affiliated with China's Second Artillery Force and missile and aerospace industry have published several studies on MIRV-related research in recent years.⁷⁷

Converting the DF-5s to a MIRV configuration, if China were to decide to do so, would dramatically increase the number of warheads that China could deliver against "soft targets," such as major cities and large military installations, in the continental United States. According to one analyst, "Chinese military experts also talk increasingly frequently about a deployment of five to seven warheads atop the existing silo-based missiles as a counter to US missile defense. Steps such as these could result in an increase from 20 to 100 or more nuclear weapons deployed by China capable of reaching the United States." Chinese researchers have also discussed employing decoys to penetrate an enemy missile defense system. Whatever

the exact numbers of warheads and decoys carried by each missile, MIRVing the DF-5 ICBMs would clearly represent a major increase in China's strategic nuclear capability.

China is also deploying two road-mobile ICBMs, the DF-31 and DF-31A. The DF-31 (CSS-10 Mod 1) is a three-stage, solid-propellant, road-mobile ICBM with a maximum range of more than 7,200 kilometers (more than 4,500 miles). The DF-31 is probably intended to replace China's aging limited-range DF-4 missiles. The DF-31 is deployed on a mobile erector launcher, and thus it is likely intended mainly to cover targets in Russia and Asia, but its range is sufficient to reach US missile defense sites in Alaska, US forces in the Pacific, and targets in parts of the western United States.⁷⁹ After a protracted development history that began in the 1980s, China conducted the first developmental flight test of the DF-31 in August 1999. Following this initial flight test, the system remained under development for several more years, despite numerous predictions that its deployment was imminent. It was finally deployed in 2006.⁸⁰ By 2010, according to the US Department of Defense (DoD), China had deployed fewer than 10 DF-31 launchers.⁸¹

The DF-31A (CSS-10 Mod 2) is a three-stage, road-mobile ICBM with a maximum range of more than 11,200 kilometers (more than 7,000 miles). The DF-31A's longer range allows it to reach targets throughout most of the continental United States. A 2009 DoD report on Chinese military power states that China began deploying the DF-31A (CSS-10 Mod 2) in 2007. As of 2010 China had fielded 10–15 DF-31A launchers.⁸²

China also still has sixteen to twenty-four of its older, shorter-range, liquid-fueled DF-4 (CSS-3) ICBMs.^{§3} The DF-4 is a two-stage, liquid-propellant missile with a range of about 5,400 kilometers (more than 3,400 miles). The DF-4 can be deployed in silos, but it is also transportable. China has about ten to fifteen launchers, according to NASIC.^{§4} Many observers anticipate that China will decommission its limited-range DF-4s now that it has deployed the DF-31 ICBM.

In addition, China may also be developing one or more additional ICBMs. A 2010 DoD report indicated that China could be developing a new road-mobile ICBM that could be equipped with MIRVs. Statement should be seen in the context of numerous media reports that have appeared over a number of years suggesting that other ICBMs might be under development. Indeed, rumors about a possible DF-41 ICBM program have been in circulation for more than a decade, but some suggest that the program may have been canceled. More recently, a Hong Kong magazine reported that China is "speeding up" the development of a new DF-51 ICBM, but the article provided no information on its mission or characteristics. To

Submarine-Launched Ballistic Missiles

China's undersea deterrent is undergoing a generational change with the emergence of the Type-094, or Jin-class, nuclear-powered ballistic missile submarine. The Jin represents a substantial improvement over China's first-generation Type-092, or

Xia-class, SS but never co carry 12 CS! 1,600 kilom After its disa enough Type ous deterren build a "fleet capacity for SSBNs will b mated range At least two a three-stage 4,500 miles). what should a successful J in the summe

Possible Nuc

Nuclear-ai complement t air- and grou carrying nucle LACM capab forces. Accord missiles that co survivability, f 2009 NASIC states that the tional or nuc nuclear-armed Indeed, as Jeff deployed nucle siles may be ca that a nuclear

Possible Tacti

Relatively li nuclear weapon tactical nuclear was concerned mine conclusive missile, MIRVing the na's strategic nuclear

31 and DF-31A. The -mobile ICBM with a 100 miles). The DF-31 e DF-4 missiles. The ikely intended mainly it to reach US missile 1 parts of the western: began in the 1980s, F-31 in August 1999. Evelopment for several was imminent. It was epartment of Defense

le ICBM with a maximiles). The DF-31A's the continental United tes that China began 10 China had fielded

ter-range, liquid-fueled pellant missile with a : DF-4 can be deployed teen launchers, accord-commission its limited-

e additional ICBMs. A ng a new road-mobile t should be seen in the a number of years sugideed, rumors about a nore than a decade, but More recently, a Hong development of a new its mission or charac-

change with the emer: missile submarine. The generation Type-092, or

Xia-class, SSBN. The Xia-class boat (hereafter, Xia) was launched in the early 1980s but never conducted a deterrent patrol. China currently has one Xia intended to carry 12 CSS-NX-3 (JL-1) SLBMs with a relatively short maximum range of about 1,600 kilometers (more than 1,000 miles), but it is not considered operational.88 After its disappointing experience with the Xia, China appears determined to build enough Type-094 SSBNs to enable the PLA Navy (PLAN) to conduct near-continuous deterrent patrols. The US Office of Naval Intelligence forecasts that China will build a "fleet of probably five Type-094 SSBNs . . . to provide more redundancy and capacity for a near-continuous at-sea presence."89 Each of these second-generation SSBNs will be outfitted with twelve developmental JL-2 SLBMs that have an estimated range of at least 7,200 kilometers and are equipped with penetration aids.90 At least two Jin-class SSBNs have been launched, but the JL-2 (CSS-NX-14) SLBM, a three-stage SLBM with a maximum range of about 7,200 kilometers (more than 4,500 miles), reportedly remains under development,91 having failed "several of what should have been the final round of flight tests."92 Chinese sources claim that a successful JL-2 test, possibly limited to missile surfacing control, finally occurred in the summer of 2011.93

Possible Nuclear Land-Attack Cruise Missiles

Nuclear-armed land-attack cruise missiles (LACMs) could also be deployed as a complement to China's nuclear ballistic missiles. Indeed, DoD assesses that the new air- and ground-launched cruise missiles China is developing may be capable of carrying nuclear warheads.94 If armed with nuclear warheads, the PLA's emerging LACM capabilities could supplement China's theater and strategic ballistic missile forces. According to the 2009 DoD report, "New air- and ground-launched cruise missiles that could potentially perform nuclear missions would similarly improve the survivability, flexibility, and effectiveness of China's nuclear forces."95 Likewise, the 2009 NASIC report on worldwide cruise missile and ballistic missile capabilities states that the DH-10 missile in particular could be capable of carrying a conventional or nuclear warhead.96 Whether China will ultimately choose to deploy nuclear-armed ground- or air-launched cruise missiles, however, remains unclear. Indeed, as Jeffrey Lewis has noted, the DoD report does not state that China has deployed nuclear-armed LACMs; it simply indicates that some Chinese cruise missiles may be capable of carrying nuclear warheads. There is no conclusive evidence that a nuclear warhead has been so assigned.97

Possible Tactical Nuclear Weapons

Relatively little research has addressed Chinese views on nonstrategic, or tactical, nuclear weapons. The available literature suggests that China has been interested in tactical nuclear weapons for some time, especially during the period when Beijing was concerned about a potential Soviet invasion. Scholars have been unable to determine conclusively whether China currently possesses any tactical nuclear weapons.⁹⁸

Discussions of coordination between the Second Artillery Force and the nuclear forces operated by the PLAN and the PLAAF in some Chinese sources seem to suggest that the PLAAF may retain the capability to deliver nuclear bombs, presumably against close-in targets. Conversely, China's 2006, 2008, and 2010 Defense White Papers discuss the nuclear capabilities of the Second Artillery and PLAN but mention only conventional missions for the PLAAF, which implies that the air force may play no part in nuclear deterrence.

Additionally, Chinese sources hint at potential Chinese interest in other types of tactical nuclear forces, including short-range ballistic missiles with nuclear warheads and neutron-bomb-type (enhanced radiation) warheads. According to Zhao Xijun, "The missiles of the tactical missile force usually carry conventional warheads. They can also carry a nuclear warhead or a special warhead according to the needs of the task and strike targets."99 It is unclear from the context of this passage, however, whether Zhao is referring specifically to Chinese missile forces or to tactical missile forces in general. Even more ambiguously, SSAC mentions neutron bombs as follows: "Neutron bombs in particular are small-scale hydrogen bombs that increase the strength of nuclear radiation in the early period after being detonated. On the battlefield, they can be used in large numbers and they are extremely lethal to humans."100 Again, however, it is far from clear whether this passage is intended to imply that China has such weapons in its arsenal or simply to serve as a brief overview of the characteristics and capabilities of neutron bombs. Because available materials are far from definitive, it is unclear what types of nonstrategic nuclear weapons China currently maintains, if any; and how, if at all, such forces figure into Chinese nuclear war plans.

Training

In January 2011 Second Artillery Force commander Jing Zhiyuan and political commissar Zhang Haiyang issued an order emphasizing the central role of training in further enhancing the combat capabilities of the missile force. Jing and Zhang urged the missile force to "uphold military training as a key focus in expanding and deepening preparation for military struggle, the basic way to generate, consolidate, and enhance combat power, and regular, core work in the development of [missile force] units." Reflecting this high-level emphasis on the importance of training, Chinese military media reports suggest that Second Artillery training is growing in realism and complexity. In particular, as part of the PLA's broader program of training reforms, the Second Artillery is making progress in areas such as training under more realistic combat conditions, which incorporate opposition "blue forces"; electronic warfare; nighttime and adverse weather training; air defense and tactics to counter intelligence, surveillance, and reconnaissance (ISR); and more rigorous training evaluations. These developments represent significant progress in the rigorousness of Second Artillery training.

The Second Artillery emphasizes that "troops should train as they will fight," which means that exercises should take place under realistic conditions so as to

temper the sk "flexible appl realistic as "a innovating bo reports indicalinks, which I tested emerger blocked roads many PLA exe simulated opp exercises as pa tions.103 One re young, well-ed use of simulate training more response to ch tactics. It besp enterprise.

Other reporting to deviate diers to cope was communicate wactions in une practiced movi primary launch Second Artille, entail consider reports indicate training. 106

The Second enemy ISR, prokeeping with the contained in recimprove the PL units to practice EW techniques exercises that reports. 108 Mar enemy ISR syst strikes and elect Second Artiller sophisticated dispace-based IS systems. 109

ree and the nuclear purces seem to sugpombs, presumably 110 Defense White and PLAN but menat the air force may

st in other types of h nuclear warheads ing to Zhao Xijun, nal warheads. They to the needs of the passage, however, r to tactical missile tron bombs as folombs that increase detonated. On the extremely lethal to ssage is intended to erve as a brief over-. Because available onstrategic nuclear ch forces figure into

iyuan and political tral role of training ce. Jing and Zhang focus in expanding to generate, consolthe development of the importance of Artillery training is the PLA's broader ogress in areas such orporate opposition eather training; air connaissance (ISR); represent significant

as they will fight," conditions so as to

temper the skills their units will need in actual combat. Jing and Zhang demand "flexible application of principles and tactics" in keeping with making training as realistic as "actual war." 101 For one model brigade, this entails "updating concepts, innovating boldly, and putting [them] to real-war tests."102 Chinese military media reports indicate that some recent exercises have simulated a loss of communications links, which has forced units to switch to backup communications. Others have tested emergency repair capabilities such as erecting replacement bridges, clearing blocked roads, and repairing damaged facilities. Another important way in which many PLA exercises now attempt to enhance the level of realism is by incorporating simulated opposing forces. Second Artillery units frequently conduct opposing force exercises as part of this drive to train under more realistic and challenging conditions. 103 One recent exercise reportedly featured sophisticated blue force efforts from young, well-educated personnel familiar with foreign military capabilities. 104 Such a use of simulated adversaries in exercises is particularly noteworthy because it makes training more realistic and challenging, encourages officers to take the initiative in response to changing situations, and gives troops exposure to possible adversary tactics. It bespeaks a clear understanding that warfare is an exceedingly interactive enterprise.

Other reports indicate that training is sometimes designed to force participating units to deviate from their prepared plans. This is done to prepare officers and soldiers to cope with actual combat situations in which they may lose the ability to communicate with higher headquarters or find that the enemy has reacted to their actions in unexpected ways. Along these lines, Second Artillery Force units have practiced moving to alternate launch sites and erecting temporary launchpads when primary launch positions are "destroyed" during exercises. Since the late 1990s Second Artillery training has also emphasized inter-theater deployments, which entail considerable operational and logistical challenges. Chinese military media reports indicate that Second Artillery units are also conducting nighttime maneuver training. 106

The Second Artillery Force has also practiced a variety of techniques to counter enemy ISR, precision strike, jamming, and electronic warfare (EW) attacks. ¹⁰⁷ In keeping with the emphasis on training in a "complex electromagnetic environment" contained in recent General Staff Department training guidelines, this is intended to improve the PLA's ability to operate in an EW environment and to allow military units to practice various types of counterreconnaissance, offensive EW, and counter-EW techniques. The Second Artillery has followed these guidelines by conducting exercises that emphasize EW training, according to Chinese military media reports. ¹⁰⁸ Many exercises have focused on employing countermeasures against enemy ISR systems, and some have incorporated simulated enemy precision air strikes and electronic jamming. In addition, Chinese media reports indicate that the Second Artillery is conducting exercises that test its ability to employ increasingly sophisticated decoys and camouflage methods to defeat adversary airborne and space-based ISR capabilities, including optical, infrared, and radar imagery systems. ¹⁰⁹

The PLA has also conducted numerous multiservice exercises in recent years, which have provided considerable opportunities for the Second Artillery Force to improve its experience conducting joint operations and joint command and control. 110 For example, in the summer of 2006 the PLA conducted the North Sword–07 exercise, in which Second Artillery units operated alongside two ground-force divisions, PLAAF units, and People's Armed Police troops. The exercise scenario involved long-distance maneuvers, intelligence collection, and mobile counterattack operations. 111

Still another important area of emphasis in training is command automation and missile force command and control. Current senior leadership training guidance highlights the importance of the "informatization" of the missile force and the development of "information system-based 'system of systems' operations capabilities." Chinese military media reports also highlight the Second Artillery's employment of an "integrated command platform" that enables commanders to coordinate and direct the operations of multiple brigades and launch units with different types of equipment, 113 and to conduct structured attack training. 114 Related exercises have involved deploying a new field command post. 115

The Second Artillery Force is also making greater use of simulations, computer war games, and command post exercises to improve the planning and decision-making skills of commanders and their staffs. These are relatively low-cost techniques that allow officers and soldiers to accumulate valuable experience at lower expense and risk than live-fire exercises. The Second Artillery has been employing simulators to prepare its forces to operate developmental missile systems before they are deployed.¹¹⁶

Finally, a sometimes overlooked but very important element of the PLA's training reform program is the emphasis on standardization of training and the development and application of more stringent criteria for the examination and evaluation of military training. This emphasis on rigorous screening and evaluation is reflected by the recent promotion of "two commanders, one operator" testing and evaluation, which focuses on assessing the capabilities of missile launcher and launch battalion commanders and specialist operators in the Second Artillery.¹¹⁷ This marks a particularly important change in that more rigorous evaluation of training helps identify problems and shortcomings, thereby improving readiness and combat capabilities. In addition, the Second Artillery Force has issued a series of regulations intended to standardize training practices and promote more robust testing and evaluation of nuclear and conventional missile force units. 118 Chinese military media reports indicate that training assessment is becoming increasingly realistic and that units are being compelled to address shortcomings identified as part of the evaluation process. Commanding officers reportedly are held accountable when units fail to measure up to training standards, and are obligated to identify problems and draw up plans for improvement to raise the level of training.

Key Drivers

The principal driver behind these developments in doctrine, force structure, and training is China's growing concern about the viability of its traditional deterrent

posture. Chine make deterren improvements Concerns aboreflected in Cl Campaigns (20 by weapons of must also be pr sion guided munently in discur force, is geared to the developn

Chinese ana serious threat to chun, "Once th rent force with challenges to the countries." Chi easier for the U to Rong Yu and

Today, with a easier. . . . If adversary's naity of a coun defense capab able for the act the capacity of eliminate the the BMD syst the choice of 1

China clearly fulfilling deterrer that an effective tional or nuclear wise neutralize I

The Ur Decla

China is concern that it believes the suggests that it we force structure is ventional "prome es in recent years, Artillery Force to ommand and conne North Sword-07 ground-force diviexercise scenario obile counterattack

ind automation and ining guidance highree and the developions capabilities."112 ry's employment of to coordinate and th different types of lated exercises have

nulations, computer nning and decisiontively low-cost techexperience at lower has been employing e systems before they

of the PLA's training and the development on and evaluation of luation is reflected by sting and evaluation, and launch battalion 7 This marks a particraining helps identify I combat capabilities. gulations intended to ing and evaluation of ry media reports inditic and that units are the evaluation process. nits fail to measure up and draw up plans for

e, force structure, and ts traditional deterrent posture. Chinese analysts recognize that a more survivable posture is required to make deterrence credible and effective in the face of growing challenges posed by improvements in ISR, missile defense, and conventional precision strike capabilities. Concerns about the threat posed by enemy conventional strike capabilities are reflected in Chinese military publications. For example, according to *Science of Campaigns* (2000), in addition to guarding against nuclear or possibly other attacks by weapons of mass destruction, the Second Artillery Force's strategic missile forces must also be prepared to defend against conventional attacks using long-range precision guided munitions.¹¹⁹ The concept of "close protection," which features prominently in discussions of the importance of improving the survivability of the missile force, is geared toward dealing with these threats. China is also responding actively to the development and deployment of the US missile defense system.

Chinese analysts view US pursuit of a missile defense system as a particularly serious threat to the viability of China's nuclear deterrent. According to Wang Zhongchun, "Once the system is completed, the United States will obtain a strategic deterrent force with both offensive and defensive capabilities, which could pose serious challenges to the limited nuclear deterrent capabilities of medium-sized nuclear countries." Chinese analysts state that ballistic missile defense (BMD) will make it easier for the United States to consider the first use of nuclear weapons. According to Rong Yu and Peng Guangqian:

Today, with the gradual shaping of the American shield, offensive action is far easier. . . . If the United States does not have foolproof confidence to erase the adversary's nuclear arsenal in a first strike, it will have to deliberate on the possibility of a counterattack. However, should the United States possess the strategic defense capabilities, its first strike would leave only a few nuclear weapons available for the adversary to launch a retaliatory counterattack, which would be within the capacity of its missile defense system to intercept; a second strike would then eliminate the remainder of the adversary's nuclear force. It is apparent that, with the BMD system, US decision makers would be greatly emboldened when facing the choice of launching a preemptive or even preventative nuclear attack. 120

China clearly places a high priority on ensuring that its forces are capable of fulfilling deterrent and countercoercion missions. Chinese strategists have concluded that an effective deterrent posture requires not only the ability to survive a conventional or nuclear first strike but also the capacity to penetrate, overwhelm, or otherwise neutralize US missile defense systems.

The United States-China Strategic Security Relationship, Declaratory Policy, and the Risks of Crisis Instability

China is concerned about "destabilizing" US conventional weapons developments that it believes threaten its nuclear deterrent. Although China's declaratory policy suggests that it will not compete in an arms race, movement toward a more robust force structure is occurring as a consequence of US development of BMD and conventional "prompt global strike" (PGS). Expectations about US BMD developments

in particular are clearly a major factor shaping China's calculations about how many weapons it needs to support a nuclear strategy of effective deterrence.

From Beijing's perspective, Chinese strategists have argued that US missile defense systems and proposed conventional global strike programs would degrade strategic stability by compromising China's assured second-strike capability. Specifically, Chinese scholars have suggested that such capabilities would make it easier for the United States to contemplate a first strike against China. Indeed, Chinese analysts view US pursuit of a missile defense system as a serious threat to the viability of China's nuclear deterrent. ¹²¹ Some state that BMD will make it easier for the United States to consider the first use of nuclear weapons. ¹²²

US proposals to deploy PGS capabilities, which have been mentioned in several recent policy documents, including the 2010 Quadrennial Defense Review and the Nuclear Posture Review, have also raised concerns among China's analysts that such capabilities could undermine its strategic stability. Recently, some Chinese scholars have expressed concerns that even if US missile defense and PGS systems have little or no real impact on China's assured second-strike capability, they may still give US planners and decision makers a false sense of superiority, which potentially could lead to US attempts to coerce China with nuclear threats in a crisis. 123 They raise the possibility that even the illusion of "nuclear primacy" could lead to more aggressive behavior on the part of the United States. 124

Moreover, some military publications and the comments of some Chinese strategists are not fully in line with declaratory policies like NFU. This raises potential doubts about Beijing's commitment to such policies in certain circumstances. This is of potential concern, particularly given the fact that United States—China nuclear relations remain less formal than those that prevailed between the United States and the USSR, which could have sinister implications for a possible crisis or instability. China's official policy is NFU, and Beijing asserts that it requires lean and effective nuclear deterrence that meets the needs of national security.

To be sure, there is a disconnect between China's official posture and certain sections of books like IW and SSAC, particularly the ones that contemplate conditions under which NFU would not really apply, or that indicate the nuclear force is useful for deterring conventional attacks and for escalation control. But other sections of the same publications are very much consistent with Beijing's official policy, such as those in which the authors state that the Second Artillery Force would need to conduct nuclear counterstrike operations in a harsh environment because they would already have been hit by an enemy first strike. In sum, then, there is some inconsistency between official policy and some parts of the books, but other parts are more closely aligned with the declaratory policy. One plausible explanation is that these differences reflect debate over these issues at the time the books were published. Another is that they were intended at least in part to induce caution among potential adversaries by indicating that under certain circumstances, conventional attacks against strategic targets in China could lead to nuclear escalation, notwithstanding China's NFU policy.

Perhaps of greatest concern, authoritative doctrinal publications reveal disturbing overconfidence in China's ability to maintain escalation dominance and strategic

clarity. For ex forces creates particularly tr the message that the ability to c publications c sile strikes, un deterrence. Ditions suggest a trol and reflecstrategy in resp

Some Chine calculations th during a crisis that during mi situations," "I Although this s of realizing tha hopes of causir ently fail to cor sary. This is ar accelerate escal tially escalatory tal) missiles wit opponent."127 A this could be a nuclear power-

Nevertheless deter an advers deterrent opera "Whether the ti correctly choses the appropriate eruption of war, If inappropriate rate, even leadin such discussion developed.

Beijing is no los which the threat be considered so tions about how many errence.

gued that US missile grams would degrade strike capability. Spes would make it easier hina. Indeed, Chinese us threat to the viabilmake it easier for the

I mentioned in several efense Review and the na's analysts that such some Chinese scholars 'GS systems have little they may still give US hich potentially could crisis. 123 They raise the ead to more aggressive

of some Chinese strate. This raises potential circumstances. This is States—China nuclear the United States and ale crisis or instability. tires lean and effective

al posture and certain at contemplate condiate the nuclear force is control. But other sec-Beijing's official policy, lery Force would need ronment because they m, then, there is some books, but other parts lausible explanation is: time the books were part to induce caution circumstances, convento nuclear escalation,

cations reveal disturbominance and strategic clarity. For example, instability may result if the alerting or de-alerting of strategic forces creates a temporary state of increased vulnerability. Miscalculation is another particularly troubling possibility, one that could be heightened by uncertainty over the message that one side is trying to convey to the other or by overconfidence in the ability to control escalation. Some of the signaling activities described in Chinese publications could easily be misinterpreted as preparations to conduct nuclear missile strikes, undercutting crisis stability even if Beijing actually intends to strengthen deterrence. Discussions such as these in Chinese publications on missile force operations suggest a complex and evolving attitude toward deterrence and escalation control and reflect discussions and debates among strategists about refining deterrence strategy in response to emerging challenges.

Some Chinese sources contain references that raise troubling questions about miscalculations that could result from attempts to bolster the robustness of deterrence during a crisis or amid a conventional conflict. Escalation could ensue. The first is that during mid-intensity nuclear deterrence operations, in order to "create credible situations," "liquid fueled missiles are engaged in simulated replenishments." 125 Although this signal is intended to put the enemy under the severe psychological strain of realizing that China's missile forces have entered the "pre-mobilization state" in hopes of causing the adversary to "abandon certain activities," 126 the authors apparently fail to consider the potential for grave miscalculation on the part of the adversary. This is an especially alarming possibility, in that such activities could greatly accelerate escalation rather than cause the adversary to back down. Another potentially escalatory move envisioned by Zhao is the launch of long-range (intercontinental) missiles with nonnuclear warheads, "so as to create psychological shock in the opponent."127 Although he offers no caution about the risks of unintended escalation, this could be a very destabilizing action, especially during a conflict with another nuclear power-much as Chinese commentators warn about PGS.

Nevertheless, some Chinese authors do acknowledge that actions intended to deter an adversary could instead provoke escalation. Zhao himself cautions that deterrent operations could accidentally trigger escalation if staged improperly: "Whether the timing for conducting the military deterrence of the missile forces is correctly chosen will directly affect the progress of deterrence and its outcome. If the appropriate timing is chosen, then deterrence will deter the enemy, contain the eruption of war, and obtain the objective of peace with the small price of deterrence. If inappropriate timing is chosen, then deterrence may cause the situation to deteriorate, even leading to the eruption and escalation of war." ¹²⁸ Unfortunately, however, such discussions in Zhao's volume and other relevant publications are underdeveloped.

Conclusion

Beijing is no longer content to rely on a minimal deterrence force posture from which the threat of nuclear retaliation with a handful of surviving weapons would be considered sufficient to constrain an adversary. Therefore, it is modernizing its

recognition that n ests in regional sec

1. National Ai Cruise Missile Thr. .fas.org/programs/ss

2. Ibid., 19.

3. Information of National Defense in 29/content_5547025 Trajectory of the PL Exploring the Content Scobell (Carlisle, PA

4. Chu Shulong Long Shadow: Nucle Alagappa (Stanford,

5. Li Bin, "中 世界经济与政治[W

6. Analyzing Chi cial sources are incoronly official bilingual and China's nuclear definitions. Minimum prevent attack, with th "There is no consens past by some Chinese strong nuclear superiodeter the adversary." tional doctrines specifiedological, and econo Chinese Glossary of N Security Glossary (W Energy Press, 2008), 3

7. M. Taylor Frave The Evolution of Chin 35, no. 2 (Fall 2010):

8. Ibid., 51-52.

9. Ibid., 86.

10. Dennis J. Blaski Technology and Doctri no. 3 (June 2011): 355-

11. Zhao Zekuan, "the New Period," China

theater and strategic nuclear forces by enhancing survivability, increasing striking power, and countering missile defense developments. The deployment of roadmobile ICBMs is improving the survivability of Chinese nuclear forces by making them more challenging to locate and target. The deployment of the Jin-class SSBNs will diversify China's strategic deterrent by adding a sea-based nuclear retaliatory capability. Moreover, with the deployment of the DF-31 and DF-31A ICBMs and the anticipated introduction of the JL-2 missiles on board the Jins, China is finally attaining a credible nuclear deterrent based on a survivable second-strike capability. Our assessment is thus consistent with those of many Chinese analysts, who conclude that the deployment of land-based mobile missiles and SSBNs will "fundamentally ensure the reliability and credibility of China's nuclear force." 129

As mentioned in the previous section, there are a number of reasons to be concerned that the transition to a more secure second-strike capability will not necessarily translate immediately or automatically into greater strategic stability. Indeed, it is entirely possible that these developments could in fact contribute to interactions that might decrease crisis stability under certain circumstances, particularly if planners and decision makers in either country fail to consider the potential implications of certain actions. Washington will thus need to proceed carefully to avoid precipitating counterresponses that are contrary to US interests, such as a larger-than-planned Chinese nuclear force buildup, further development of counterspace capabilities, or potentially destabilizing higher alert levels.

At the same time, however, the introduction of road-mobile strategic missiles and SSBNs will increasingly enable China to achieve its desired posture of effective deterrence. The modernization of Chinese nuclear forces and the transition from silo-based to road-mobile nuclear missiles and SSBNs might thus enhance the stability of strategic deterrence. Indeed, deterrence theory suggests that a more secure second-strike capability should enhance stability by encouraging both the United States and China to behave much more cautiously.¹³⁰

Consequently, as China continues to modernize its nuclear and missile forces, preserving strategic stability promises to become a far more important aspect of the United States—China security relationship in the coming years. Indeed, successfully managing what could become a dangerous balancing act will require much of both parties. The United States will need to exercise considerable self-restraint, given the asymmetries that will continue to characterize the United States—China nuclear balance, despite China's recent enhancement of its nuclear and conventional missile capabilities. Planners and decision makers in the United States will also need to acquire an in-depth understanding of Chinese views on strategic signaling, crisis management, and escalation control, particularly in the context of a conflict over Taiwan. Meanwhile, Chinese planners and decision makers will need to have a similarly realistic understanding of US views and motivations.

This emerging dynamic within the United States-China strategic relationship thus underscores the need for greater United States-China dialogue and engagement on strategic issues. Although China historically has been reluctant to increase transparency, especially in the realm of its nuclear missile forces, its growing capabilities may create a new level of confidence on Beijing's part, and perhaps even a nascent

increasing striking ployment of roadforces by making he Jin-class SSBNs nuclear retaliatory F-31A ICBMs and ns, China is finally id-strike capability, analysts, who consts will "fundamen-

reasons to be cony will not necessarstability. Indeed, it oute to interactions particularly if plantential implications lly to avoid precipih as a larger-thancounterspace capa-

2,77129

le strategic missiles posture of effective the transition from s enhance the stabilthat a more secure ing both the United

and missile forces, portant aspect of the Indeed, successfully equire much of both f-restraint, given the s-China nuclear balconventional missile tes will also need to tegic signaling, crisis ext of a conflict over I need to have a simi-

egic relationship thus e and engagement on to increase transpargrowing capabilities erhaps even a nascent recognition that modest increases in transparency could help safeguard shared interests in regional security and strategic stability.

Notes

- 1. National Air and Space Intelligence Center (hereafter, NASIC), Ballistic and Cruise Missile Threat, April 2009, Federation of American Scientists website, www.fas.org/programs/ssp/nukes/NASIC2009.pdf, 3.
 - 2. Ibid., 19.
- 3. Information Office of the State Council of the People's Republic of China, China's National Defense in 2006, December 2006, http://news.xinhuanet.com/english/2006-12/29/content_5547029.htm. See also Evan S. Medeiros, "'Minding the Gap': Assessing the Trajectory of the PLA's Second Artillery," in Right-Sizing the People's Liberation Army: Exploring the Contours of China's Military, edited by Roy Kamphausen and Andrew Scobell (Carlisle, PA: Strategic Studies Institute, US Army War College, 2007), 143-90.
- 4. Chu Shulong and Rong Yu, "China: Dynamic Minimum Deterrence," in *The Long Shadow: Nuclear Weapons and Security in 21st Century Asia*, edited by Muthiah Alagappa (Stanford, CA: Stanford University Press, 2008), 161–87.
- 5. Li Bin, "中国核战略辨析" [Understanding China's Nuclear Strategy], 世界经济与政治 [World Economics & Politics] 9 (2006): 16–22.
- 6. Analyzing Chinese nuclear nomenclature is challenging, particularly because official sources are incomplete and take a "lowest common denominator" approach. The only official bilingual document to date that has been endorsed by the Second Artillery and China's nuclear weapons establishment, as well as US experts, offers the following definitions. Minimum deterrence: "Threatening the lowest level of damage necessary to prevent attack, with the fewest number of nuclear weapons possible." Limited deterrence: "There is no consensus on the definition." Maximum deterrence: "A term used in the past by some Chinese military scholars to describe a form of deterrence whereby with a strong nuclear superiority as support, the threat of a massive nuclear strike is used to deter the adversary." Tailored deterrence: "Flexible deterrence capabilities and operational doctrines specifically designed according to the specific psychological, political, ideological, and economic characteristics of the targeted actor." Committee on the US-Chinese Glossary of Nuclear Security Terms, English-Chinese, Chinese-English Nuclear Security Glossary (Washington and Beijing: National Academies Press and Atomic Energy Press, 2008), 36, 33, 35, 74, www.nap.edu/catalog/12186.html.
- 7. M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security* 35, no. 2 (Fall 2010): 48.
 - 8. Ibid., 51-52.
 - 9. Ibid., 86.
- 10. Dennis J. Blasko, "'Technology Determines Tactics': The Relationship between Technology and Doctrine in Chinese Military Thinking," *Journal of Strategic Studies* 34, no. 3 (June 2011): 355–81.
- 11. Zhao Zekuan, "New Development of Nuclear Deterrence Theory and Practice in the New Period," *China Military Science* 1 (2009): 16–20.

- 12. Wang Wenrong, ed., Zhanlüexue [The science of strategy] (Beijing: National Defense University Press, 1999), 348.
- 13. Break the Nuclear Monopoly, Eliminate Nuclear Weapons (Beijing: Foreign Languages Press, 1965), 1-5. See also John Wilson Lewis and Xue Litai, China Builds the Bomb (Stanford, CA: Stanford University Press, 1988), 241-43.
- 14. Yu Jixun, The Science of Second Artillery Campaigns (hereafter, SSAC) (Beijing: People's Liberation Army Press, 2004), 53. Yu Jixun was a high-ranking missile force officer.
 - 15. Ibid., 53.
 - 16. Lewis and Xue, China Builds the Bomb, 205-6.
 - 17. Zhao, "New Development of Nuclear Deterrence."
- 18. John Wilson Lewis and Hua Di, "China's Ballistic Missile Programs: Technologies, Strategies, Goals," *International Security* 17, no. 2 (fall 1992): 15.
 - 19. Lewis and Xue, China Builds the Bomb, 190-218.
 - 20. Zhao, "New Development of Nuclear Deterrence," 17.
 - 21. Ibid., 17.
 - 22. Ibid., 17.
 - 23. Lewis and Hua, "China's Ballistic Missile Programs," 19.
- 24. Dennis J. Blasko, "Military Parades Demonstrate Chinese Concept of Deterrence," *China Brief* 9, no. 8 (April 16, 2009), www.jamestown.org/single/?no_cache = 1&tx_ttnews%5Btt_news%5D = 34869.
 - 25. Zhao, "New Development of Nuclear Deterrence," 17.
- 26. Lan Rongcheng and Li Wei, "Review of Second Artillery Building in the Past 60 Years," China Military Science 4 (2009).
- 27. Tien Ping, "核政策有调整空间" [Space for readjustment in nuclear policy], 香港商報訊 [Hong Kong Commercial Daily], June 23, 2003.
- 28. This is the official Chinese translation. "Deterrence" might be better translated as "coercion" here.
 - 29. SSAC, 54.
 - 30. Ibid.
 - 31. Zhao, "New Development of Nuclear Deterrence," 18.
- 32. SSAC, 138. We believe that SSAC represents the Second Artillery's best effort at producing a high-level professional military handbook for missile-force personnel, but it should be noted that the Second Artillery is not the final arbiter of decisions about nuclear policy and strategy issues, which are presumably considered by China's highest-level civilian and military leaders.
- 33. Information Office of the State Council of the People's Republic of China, China's National Defense in 2006 (Beijing: People's Republic of China, 2006), http://news.xinhuanet.com/english/2006–12/29/content_5547029.htm.
 - 34. Zhanlüexue [The science of strategy] (1987), 115.
- 35. These include Wang Hongqing and Zhang Xingye, eds., Zhanyixue [The science of campaigns] (hereafter, SOC) (Beijing: National Defense University Press, 2000); Xue Xinglin, ed., Zhanyi Lilun Xuexi Zhinan [Campaign theory study guide] (Beijing: National Defense University Press, 2001); and Zhang Yuliang, ed., SOC (Beijing: National Defense University Press, 2006).
- 36. Peng Guangqian and Yao Youzhi, eds. Zhanlüexue [The science of strategy] (Beijing: Military Science Press, 2001), 235.

- 37. Fravel and
- 38. SSAC, 273-
- 39. Ibid., 273.
- 40. Ibid., 274.
- 41. Ibid., 144.
- 42. Ibid., 59.
- 43. Yao Yunzh Strategic Insights cations/OnlineJou
- 44. Yao Yunzh Journal, Spring 20
- 45. Rong Yu ar
- 5, no. 1 (Winter 20 46. Rong and P
- 47. Zhao Xijun
- Coercion (hereafte
- 48. Zhang Peim 2 (February 2004).
 - 49. IW, 92.
- 50. SSAC, 294.
- 51. IW, 33.
- 52. SSAC, 295.
- 53. IW, 33.
- 54. Rong and Po
- 55. Author inter
- 56. Fravel and 1
- 57. State Counc 2011, http://merln.
- 58. Rong and Pe
- 59. See, e.g., SO
- 60. See, e.g., Xu
- 61. SSAC, 46.
- 62. Ibid., 297.
- 63. Ibid., 307.
- 64. Ibid.
- 65. Ibid., 298.
- 66. Ibid., 126.
- 67. IW, 17.
- 68. Ibid., 152-5.
- 69. "Joint count ences mention the I the PLAAF actually
 - 70. IW, 14.
 - 71. Ibid., 17.
- 72. US Departm People's Republic o

(Beijing: National

eijing: Foreign Lani, China Builds the

ter, SSAC) (Beijing: nking missile force

rograms: Technolo-

Concept of Deter-/single/?no_cache =

lding in the Past 60

in nuclear policy],

better translated as

illery's best effort at irce personnel, but it cisions about nuclear China's highest-level

lic of China, China's 106), http://news.xin

anyixue [The science ty Press, 2000); Xue udy guide] (Beijing: ed., SOC (Beijing:

science of strategy]

- 37. Fravel and Medeiros, "China's Search for Assured Retaliation," 78.
- 38. SSAC, 273-74.
- 39. Ibid., 273.
- 40. Ibid., 274.
- 41. Ibid., 144.
- 42. Ibid., 59.
- 43. Yao Yunzhu, "Chinese Nuclear Policy and the Future of Minimum Deterrence," *Strategic Insights* 4, no. 9 (September 2005), www.nps.edu/Academics/centers/ccc/publi cations/OnlineJournal/2005/Sep/yaoSep05.html.
- 44. Yao Yunzhu, "China's Perspective on Nuclear Deterrence," Air & Space Power Journal, Spring 2010, www.airpower.au.af.mil/airchronicles/apj/apj10/spr10/yao.html.
- 45. Rong Yu and Peng Guangqian, "Nuclear No-First-Use Revisited," *China Security* 5, no. 1 (Winter 2009): 89, www.chinasecurity.us/images/stories/Rong_and_Peng(1).pdf.

46. Rong and Peng, "Nuclear No-First-Use Revisited," 88.

- 47. Zhao Xijun, ed., Intimidation Warfare: A Comprehensive Discussion on Missile Coercion (hereafter, IW) (Beijing: National Defense University Press, 2005), 173.
- 48. Zhang Peimin, "How to Develop the Means of Strategic Deterrence," Military Art 2 (February 2004): 34.
 - 49. IW, 92.
 - 50. SSAC, 294.
 - 51. IW, 33.
 - 52. SSAC, 295.
 - 53. IW, 33.
 - 54. Rong and Peng, "Nuclear No-First-Use Revisited," 85.
 - 55. Author interviews with Chinese strategists, China, 2006.
 - 56. Fravel and Medeiros, "China's Search for Assured Retaliation," 80.
- 57. State Council Information Office, China's National Defense in 2010, March 31, 2011, http://merln.ndu.edu/whitepapers/China_English2010.pdf.
 - 58. Rong and Peng, "Nuclear No-First-Use Revisited," 88.
 - 59. See, e.g., SOC 2000, 371.
 - 60. See, e.g., Xue Xinglin, Zhanyi Lilun Xuexi Zhinan, 384-93.
 - 61. SSAC, 46.
 - 62. Ibid., 297.
 - 63. Ibid., 307.
- 64. Ibid.
- 65. Ibid., 298.
- 66. Ibid., 126.
- 67. IW, 17.
- 68. Ibid., 152-53.
- 69. "Joint counterstrike" presumably means Second Artillery and SSBNs. Some references mention the possibility of PLAAF participation, even though it is unclear whether the PLAAF actually retains any such capability.
 - 70. IW, 14.
 - 71. Ibid., 17.
- 72. US Department of Defense, Military and Security Developments Involving the People's Republic of China, 2009 (Washington, DC: Office of the Secretary of Defense,

2009) (hereafter, DoD 2009), www.defense.gov/pubs/pdfs/China_Military_Power_Report_2009.pdf, 24.

- 73. NASIC, Ballistic and Cruise Missile Threat, 17.
- 74. Ibid., 17.
- 75. Ibid., 21.
- 76. Robert Walpole, "Foreign Missile Developments and the Ballistic Missile Threat," Statement for the Record to the Senate Foreign Relations Committee, September 16, 1999, www.cia.gov/news-information/speeches-testimony/1999/walpole.htm.
- 77. See, e.g., Tan Shoulin, Zhang Daqiao, and Yu Zhijun, "The Optimization and Evaluation of the Warhead Separation Sequence of Multiple Independent Reentry Vehicle Missiles," *Journal of Ballistics* 3 (2006).
- 78. Brad Roberts, "Book Review: Nuclear Minimalism," Arms Control Today, May 2007, www.armscontrol.org/act/2007_05/BookReview.asp4.
- 79. Robert Walpole, "Statement for the Record to the Senate Subcommittee on International Security, Proliferation, and Federal Services on the Ballistic Missile Threat to the United States," February 9, 2000, www.cia.gov/news-information/speechestestimony/ 2000/nio_speech_020900.html4.
 - 80. DoD 2009, 24.
- 81. US Department of Defense, Military and Security Developments Involving the People's Republic of China, 2010 (Washington, DC: Office of the Secretary of Defense, 2010) (hereafter, DoD 2010), 66.
 - 82. Ibid., 66.
- 83. This estimate comes from NASIC, *Ballistic and Cruise Missile Threat*. The 2009 Department of Defense report states that China maintains about twenty DF-4s.
 - 84. Ibid., 21.
- 85. US Department of Defense, Military and Security Developments Involving the People's Republic of China, 2011 (Washington, DC: Office of the Secretary of Defense, 2011), 3.
- 86. Pamela Pun, "Experts: DF-41 Could Force US to Adjust Its Strategy," Hong Kong Standard, October 15, 1999.
- 87. Chin Chien-li, "A Critical Biography of General Peng Xiaofeng, Political Commissar of the Second Artillery Corps," *Frontline* 90 (December 2006), 64–67.
 - 88. NASIC, Ballistic and Cruise Missile Threat, 25.
- 89. US Office of Naval Intelligence, "Seapower Questions on the Chinese Submarine Force," December 20, 2006, Federation of American Scientists website, www.fas.org/nuke/guide/china/ONI2006.pdf.
 - 90. Ibid.
 - 91. NASIC, Ballistic and Cruise Missile Threat, 3.
 - 92. DoD 2010, 34.
- 93. "我们终将蛟龙托水而出,腾空飞翔,威震四海" [We will eventually let the flood dragon emerge from the water, fly forth, and shock the four seas with its might], 我的中國網 [My China Net], August 17, 2011, http://mychinanet.com/bbs/subject.aspx?board=1&topic=61542&mtopic=61542.
 - 94. DoD 2009, 24.
 - 95. Ibid.
 - 96. NASIC, Ballistic and Cruise Missile Threat, 29.

97. See Jeffrey controlwonk.com/; not do and will" (e 98. See Robert 5

Bulletin of the Ator .org/files/06400300 "Chinese Tactical In in an Evolving Secu Brassey's, 2003); an Weapons and Arms and Opportunities, Air University Press

99. IW, 16. 100. SSAC, 274.

101. Jing Zhiyua: paobing erlingyiyi ni Artillery's Military I January 1, 2011.

102. Xu Changle force adds informati 103. See, e.g., Xu 设置对抗演练新课 kemu" [A certain bri force training exercis

104. Li Yan, Zh 增长'狼性'"[At a ce. increase their "aggres

105. Yu Juncheng, porary launchpad es 2006, 1.

106. Ma Zhongbe quan yaosu, duolu d exercise involving mul bao, August 1, 2006.

107. Yan Xifei, Ta action], 火箭兵报, Hi 108. "Second Artill in a Complex Electron 109. Wang Tie and Head Wang Xiangwei:

1, 2003, 24–26. 110. US Department People's Republic of C 16, www.dod.gov/pub

111. US Departmen People's Republic of C. 24, www.defense.gov/p _Military_Power_

ic Missile Threat," :ee, September 16, ple.htm.

Optimization and ent Reentry Vehicle

ontrol Today, May

committee on Interlissile Threat to the speechestestimony/

nents Involving the ecretary of Defense,

le Threat. The 2009 ty DF-4s.

nents Involving the lecretary of Defense,

rategy," Hong Kong

ig, Political Commis-54–67.

e Chinese Submarine ebsite, www.fas.org/

ventually let the flood seas with its might], com/bbs/subject.aspx 97. See Jeffrey Lewis, "DH-10," July 14, 2008, Arms Control Wonk, www.arms controlwonk.com/1945/dh-10. As Lewis points out, "the language is could and would, not do and will" (emphasis in the original).

98. See Robert S. Norris and Hans M. Kristensen, "Chinese Nuclear Forces, 2008," Bulletin of the Atomic Scientists 64, no. 3 (July-August 2008): 42-45, www.thebulletin.org/files/064003009.pdf; Charles Ferguson, Evan S. Medeiros, and Phillip C. Saunders, "Chinese Tactical Nuclear Weapons," in Tactical Nuclear Weapons: Emergent Threats in an Evolving Security Environment, edited by Alistair Millar and Brian Miller (London: Brassey's, 2003); and Kenneth W. Allen, "China's Perspectives on Non-Strategic Nuclear Weapons and Arms Control," in Controlling Non-Strategic Nuclear Weapons: Obstacles and Opportunities, edited by Jeffrey A. Larsen and Kurt J. Klingenberger (Maxwell, AL: Air University Press, 2001).

99. IW, 16.

100. SSAC, 274.

101. Jing Zhiyuan and Zhang Haiyang, "第二炮兵二0—一年军事训练动员令, Dier paobing erlingyiyi nian junshi xunlian dongyuanling" [Mobilization order for the Second Artillery's Military Training in 2011], 火箭兵报, Huojianbing bao [Rocket forces news], January 1, 2011.

102. Xu Changlei and Li Yongfei, "导弹劲旅插上信息化'翅膀'" [Mighty missile force adds informatized wings], 火箭兵报, Huojianbing bao, May 1, 2010.

103. See, e.g., Xu Changlei, Chen Leixiang, and Li Yongfei, "某旅瞄准训练转变,设置对抗演练新课目, Moulu miaozhun xunlian zhuanbian, shezhi duikang yanlian xin kemu" [A certain brigade takes aim at transformation of training, sets up new opposing-force training exercise subjects], 火箭兵报, Huojianbing bao, February 19, 2011.

104. Li Yan, Zhang Xianqiu, and Ge Song, "某训练基地狡黠'蓝军'逼'红军' 增长'狼性'"[At a certain training base, the sly "blue force" pushes the "red force" to increase their "aggressiveness"], 火箭兵报, Huojianbing bao, June 21, 2010.

105. Yu Juncheng, "临时发射场即刻建成, Linshi fashechang jike jiancheng" [Temporary launchpad established immediately], 火箭兵报, Huojianbing bao, May 20, 2006, 1.

106. Ma Zhongbo, "全员全装全要素, 多路多向多课题, Quanyuan quanzhuang quan yaosu, duolu duoxiang duo keti" [All-personnel, all-equipment, and all-element exercise involving multiple approaches, directions, and subjects], 火箭兵报, *Huojianbing bao*, August 1, 2006.

107. Yan Xifei, Tang Licheng, and Zhang Jiangang, "'蓝军'在行动" [Blue force in action], 火箭兵报, *Huojianbing bao*, June 11, 2010.

108. "Second Artillery Red-Blue Force Confrontational Exercise Emphasizes Training in a Complex Electromagnetic Environment," Liberation Army Daily, August 26, 2006.

109. Wang Tie and Wu Yanbing, "All-Army Camouflage Specialty Group Deputy Head Wang Xiangwei: My Profession Is 'Fraud and Deception,'" *China Youth*, October 1, 2003, 24–26.

110. US Department of Defense, Annual Report to Congress: Military Power of the People's Republic of China (Washington, DC: Office of the Secretary of Defense, 2006), 16, www.dod.gov/pubs/pdfs/China%20Report%202006.pdf.

111. US Department of Defense, Annual Report to Congress: Military Power of the People's Republic of China (Washington, DC: Office of the Secretary of Defense, 2007), 24, www.defense.gov/pubs/pdfs/070523-China-Military-Power-final.pdf.

- 112. Jing and Zhang, "Dier paobing erlingyiyi nian junshi xunlian dongyuanling."
- 113. Chang Sheng and He Tianjin, "某基地加强逐级集成训练提升核心军事能力纪实" [On-the-spot report: base steps up level-by-level integrated training, boosts core military capabilities], 火箭兵报, *Huojianbing bao*, June 21, 2010.
- 114. Ding Haiming and Liang Pengfei, "中国战略导弹部队演兵场目击之三第二炮兵 4 支导弹旅联合训练实弹发射精准命中目标" [Four Second Artillery missile brigades in joint training conduct live launches, hit targets exactly], 解放军报, Jiefangjun bao [Liberation Army daily], July 17, 2009. According to this report, which describes a strategic missile force exercise, "the battlefield situation is presented in real time on a large electronic screen in the forward command post. In the joint training, an integrated command platform simultaneously directs the combat operations of several missile brigades and hundreds of launch units, on the one hand communicating with frontline missile brigades and launch battalions, exercising precise command and control over the missile group's launches."
- 115. Xu Changlei, "某部新型野战指挥所演兵场上显神威" [A certain unit demonstrates prowess on the training ground with its new field combat operations command post], 火箭兵报, *Huojianbing bao*, May 11, 2010.
- 116. "PLA's New Missile Tested Successfully and Begins to Equip Strategic Rocket Forces," *Liberation Army Daily*, October 16, 2006.
- 117. See, e.g., Yue Xiaolin, Li Fumin, and Yu Xihong, "某基地致力强化核心战位人员的核心作用,'两长一手'演兵场上竟风流, Mou jidi zhili qianghua hexin zhanwei renyuan de hexin zuoyong" [A certain base exerts works toward strengthening the core function of core battle position personnel: Admirable competition on "two commanders, one operator" exercise ground], 火箭兵报, Huojianbing bao, July 31, 2010.
- 118. Zhang Ligang, He Tianjin, and Kang Fashun, "第二军事训练会议在某基地召开, Dier paobing junshi xunlian huiyi zai mou jidi zhaokai" [Second Artillery military training conference held at a certain base]," 火箭兵报, Huojianbing bao, August 15, 2006.
 - 119. SOC 2000, 371.
 - 120. Rong and Peng, "Nuclear No-First-Use Revisited," 81.
- 121. Wang Zhongchun, "Nuclear Challenges and China's Choices," *China Security*, Winter 2007, 62, www.wsichina.org/cs5_4.pdf.
 - 122. Rong and Peng, "Nuclear No-First-Use Revisited," 89.
- 123. Li Bin and Nie Hongyi, "An Investigation of China-US Strategic Stability," World Economics & Politics 2 (2008): 60-61.
 - 124. Ibid., 61.
 - 125. IW, 185.
 - 126. Ibid.
 - 127. Ibid., 186.
 - 128. Ibid., 172.
 - 129. Wang Zhongchun, "Nuclear Challenges," 62.
- 130. This is strongly and seminally argued by Thomas C. Schelling, *The Strategy of Conflict* (New York: Oxford University Press, 1960), 251; and Thomas C. Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 1966), 235.

NORTH | WEAPON

Motivations, {
Terence Roehri,

ON OCTOBER 9, 2 exploded a nuclea yield of this test w and smaller than The explosion suc ity and stirring up Korea conducted ton, Beijing, Seou successful, and the cemented North K

Efforts continument and convincincreasingly unlike weapons. Pyongya program, or it mig to allow the Intern case, the likelihook Korea is quickly f US nuclear threat unthinkable even it have access to n Pyongyang will chaviews a nuclear ars

With the likelih capability, analysis role do nuclear we what are its specific analytical framewo ons strategy and do

Power, Ambition, and the Ultimate Weapon

STRATEGY IN THE SECOND NUCLEAR AGE

TOSHI YOSHIHARA and JAMES R. HOLMES, Editors

INTERNATIONAL RELATIONS / SECURITY STUDIES

"Good books on strategy are hard to find. Good books on nuclear strategy are even harder to find as we celebrate the twentieth anniversary of the ending of the Cold War. The world, strategy, technology, and economic interdependence provide a profoundly changed and dynamic environment. This book fills a huge void and will be welcomed by both scholars and military strategists alike."—Gen. Eugene Habiger, US Air Force (Ret.), former Commander, US Strategic Command

"From time to time, though rarely, there is a book that can redefine the parameters of strategic understanding and debate. Strategy in the Second Nuclear Age is one such rare book. This very well-edited collection of studies is, by quite a margin, the finest exploration and examination extant of the nuclear strategies of the newer nuclear-weapon states. I recommend it in the strongest terms."—Colin Gray, professor of international politics and strategic studies, University of Reading, UK

A "second nuclear age" has begun in the post-Cold War world. Created by the expansion of nuclear arsenals and new proliferation in Asia, it has changed the familiar nuclear geometry of the Cold War. Increasing potency of nuclear arsenals in China, India, and Pakistan, the nuclear breakout in North Korea, and the potential for more states to cross the nuclear-weapons threshold from Iran to Japan suggest that the second nuclear age of many competing nuclear powers has the potential to be even less stable than the first.

Strategy in the Second Nuclear Age assembles a group of distinguished scholars to grapple with the matter of how the United States and its allies must size up the strategies, doctrines, and force structures currently taking shape if they are to design responses that reinforce deterrence amid vastly more complex strategic circumstances.

CONTRIBUTORS

Stephen F. Burgess	Timothy D. Hoyt	James L. Schoff
Michael S. Chase	Scott A. Jones	Anupam Srivastava
Andrew S. Erickson	Helen E. Purkitt	Andrew C. Winner
Seema Gahlaut	Terence Roehrig	Christopher T. Yeaw
James R, Holmes	Joshua Rovner	Toshi Yoshihara

Toshi Yoshihara is the John A. van Beuren Chair of Asia-Pacific Studies at the US Naval War College.

James R. Holmes is an associate professor of strategy at the US Naval War College and the author of *Theodore Roosevelt and World Order*. Yoshihara and Holmes are also coauthors of *Red Star over the Pacific: China's Rise and the Challenge to US Maritime Strategy*.

Cover design: Bruce Gore I Gore Studio, Inc.

GEORGETOWN UNIVERSITY PRESS
Washington, DC WANN DRESS protestown edu

978-1-58901-928-7



STRATEGY IN THE SECOND NUCLEAR AGE

Power, Ambition, and the Ultimate Weapon

TOSHI YOSHIHARA and JAMES R. HOLMES Editors

GEORGETOWN UNIVERSITY PRESS WASHINGTON, DC

© 2012 Georgetown University Press. All rights reserved. No part of this book may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage and retrieval system, without permission in writing from the publisher.

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA

Strategy in the second nuclear age: power, ambition, and the ultimate weapon / Toshi Yoshihara and James R. Holmes, editors.

p. cm.

Includes bibliographical references and index.

ISBN 978-1-58901-928-7 (pbk. : alk. paper)

1. Nuclear warfare. 2. Nuclear weapons—Government policy. 3. Strategic forces. 4. Security, International. I. Yoshihara, Toshi. II. Holmes, James R., 1965–

U263.S773 2012 355.02'17—dc23

2012001503

® This book is printed on acid-free paper meeting the requirements of the American National Standard for Permanence in Paper for Printed Library Materials.

15 14 13 12 9 8 7 6 5 4 3 2 First printing

The views voiced in this volume do not necessarily represent the views of the US government or any other institution with which the authors are affiliated.

1 Intro
Toshi

2 After Nucl Joshu

3 South and '

4 The I Chris Mich

5 Nort Strate Terer

6 Chan Jame.

7 Thinl

8 The I Nucle Anut

9 The I Andr