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Assuring Assured Retaliation

China's Nuclear Posture and U.S.-China Strategic Stability

Fiona S. Cunningham and M. Taylor Fravel

Whether China will abandon its long-standing nuclear strategy of assured retaliation for a more offensive strategy is a critical factor in U.S.-China strategic stability and the future of East Asian security. Since testing its first nuclear device in 1964, China has sought to develop a nuclear force that could survive a first strike and then inflict unacceptable damage on an adversary. The goal of such a force has been limited to deterring nuclear coercion and the use of nuclear weapons against China. With the deployment of road-mobile, solid-fueled intercontinental ballistic missiles (ICBMs) in the mid-2000s, China appeared to be on the cusp of achieving this goal.

Advances in U.S. strategic capabilities, however, could weaken China's deterrent. Although President Barack Obama emphasized strategic stability with China and Russia during his first term, the United States has continued the George W. Bush administration's pursuit of strategic superiority through the development of a "new triad." The United States is maintaining a prominent role for nuclear weapons in its strategic posture, strengthening the submarine, land-based missile, and bomber delivery systems that make up the "old" nuclear triad. At the same time, it is developing both its missile defenses and counterforce capabilities, which would include the use of conventional weapons, such as those associated with the Conventional Prompt Global Strike (CPGS) program.[1] Taken together, these U.S. capabilities could reduce or elimi-

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1. U.S. Department of Defense, *2010 Ballistic Missile Defense Review Report* (Washington, D.C.: U.S. Department of Defense, 2010), pp. 4, 17; Amy F. Woolf, *Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues* (Washington, D.C.: Congressional Research Service, February 6, 2015), pp. 17–21; U.S. Department of Defense, *2014 Quadrennial Defense Review*

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nate China's ability to launch a retaliatory strike. As a result, they may create strong pressures on China to expand its force structure to ensure survivability under its existing strategy or abandon assured retaliation for a first-use posture, such as launch-on-warning, or a limited warfighting strategy envisaging attacks on an adversary's nuclear arsenal or conventional forces.[2]

Many analysts expect that China will abandon its current nuclear strategy. In 2006 Keir Lieber and Daryl Press predicted that "growing U.S. capabilities will pressure Russia and China to reduce the peacetime vulnerability of their forces" through "logical" precautionary steps, including larger nuclear forces coupled with more offensive postures.[3] Likewise, highlighting the vulnerability of second-strike forces, Austin Long and Brendan Green conclude that "if China is like past rising great powers, it will not accept decisive nuclear inferiority in perpetuity."[4] China's restrained nuclear posture, compared to the rapid growth in its conventional missile forces and other conventional capabilities, demonstrates that China's rise alone is insufficient to prompt a change in Chinese nuclear strategy. Historically, a similar U.S. attempt to gain strategic nuclear primacy in the early Cold War prompted the Soviet Union to abandon a more restrained nuclear posture and engage in an arms race with the United States.[5]

To assess whether China will alter its approach to nuclear strategy, this article examines Chinese views of U.S. nuclear weapons and strategy. In particular, how does China assess the threat posed by the nuclear posture of the United States? How will China respond to U.S. development of missile defense and conventional long-range strike capabilities? The answers to these questions are important for several reasons. First, the nuclear posture that China adopts will shape the prospects for arms race stability, which could in-

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Report (Washington, D.C.: U.S. Department of Defense, 2014), p. 38; and Sydney J. Freedberg Jr., "DepSecDef Explores New Missile Defense Approach," *Breaking Defense*, August 11, 2015, http://breakingdefense.com/2015/08/depsecdef-launches-new-missile-defense-approach/. Examples of intelligence, surveillance, and reconnaissance improvements include unmanned, multirole air and space platforms, as well as deployments of additional space sensors in the Asia Pacific.

2. U.S. motivations for developing the new triad include the need to counter growing Chinese conventional, space, and cyber capabilities. See David C. Gompert and Phillip C. Saunders, *The Paradox of Power: Sino-American Strategic Restraint in an Age of Vulnerability* (Washington, D.C.: National Defense University Press, 2011), p. 27.

3. Keir A. Lieber and Daryl G. Press, "The End of MAD? The Nuclear Dimension of U.S. Primacy," *International Security*, Vol. 30, No. 4 (Spring 2006), pp. 7–34, at p. 10.

4. Austin Long and Brendan Rittenhouse Green, "Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy," *Journal of Strategic Studies*, Vol. 38, Nos. 1–2 (February 2015), pp. 38–73, at p. 69.

5. Steven J. Zaloga, *The Kremlin's Nuclear Sword: The Rise and Fall of Russia's Strategic Nuclear Forces, 1945–2000* (Washington, D.C.: Smithsonian, 2002).

fluence the strategic calculations of other nuclear powers in the region, as well as those of the United States, and could influence perceptions of Chinese intentions. Second, the nuclear posture that China adopts will play a central role in U.S.-China crisis stability. If China maintains an assured retaliation posture with a strict no-first-use pledge, rejecting a first-use strategy, it would enhance crisis stability by requiring the United States to use nuclear weapons first. Third, answers to the questions above will provide an updated and comprehensive summary of Chinese views of the U.S. nuclear posture and the implications of these views for strategic stability. Recent scholarship has examined various elements of Chinese views, such as China's reaction to the United States' 2010 *Nuclear Posture Review* and U.S. missile defense developments, but they have not examined the interaction of Chinese views of these different elements and their implications for China's own nuclear strategy and strategic stability with the United States.[6]

Our analysis of Chinese views on the strategic posture of the United States yields two important findings. First, China will not abandon its strategy of assured retaliation in response to an increasingly clear U.S. commitment to stra-

6. On the 2010 *Nuclear Posture Review*, see Lora Saalman, "China and the U.S. Nuclear Posture Review" (Washington, D.C.: Carnegie Endowment for International Peace, February 2011); and Thomas Fingar, "Worrying about Washington: China's Views on the U.S. Nuclear Posture," *Nonproliferation Review*, Vol. 18, No. 1 (March 2011), pp. 51–68. On missile defense, see Lora Saalman, "The China Factor," in Alexei Arbatov, Vladimir Dvorkin, and Natalia Bubnova, eds., *Missile Defense: Confrontation and Cooperation* (Moscow: Carnegie Moscow Center, 2013), pp. 226–252; and Zhang Baohui, "U.S. Missile Defence and China's Nuclear Posture: Changing Dynamics of an Offence-Defence Arms Race," *International Affairs*, Vol. 87, No. 3 (May 2011), pp. 555–569. On Global Zero, see Christopher P. Twomey, "Nuclear Stability at Low Numbers," *Nonproliferation Review*, Vol. 20, No. 2 (July 2013), pp. 289–303. On Conventional Prompt Global Strike, see Lora Saalman, "Prompt Global Strike: China and the Spear" (Honolulu: Asia-Pacific Center for Security Studies, April 2014), http://www.apcss.org/wp-content/uploads/2014/04/APCSS_Saalman_PGS_China_Apr2014.pdf. For assessments of China's nuclear posture that do not focus on views of U.S. capabilities, see M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security*, Vol. 35, No. 2 (Fall 2010), pp. 48–87; and Michael S. Chase, "China's Transition to a More Credible Nuclear Deterrent: Implications and Challenges for the United States," *Asia Policy*, July 2013, pp. 69–101. For recent scholarship considering the impact of U.S. capabilities that does not explicitly examine Chinese views, see Gompert and Saunders, *The Paradox of Power*; and Jeffrey Lewis, "China's Nuclear Modernization: Surprise, Restraint, and Uncertainty," in Ashley J. Tellis, Abraham M. Denmark, and Travis Tanner, eds., *Strategic Asia, 2013–14: Asia in the Second Nuclear Age* (Washington, D.C.: National Bureau of Asian Research, 2013), pp. 67–98. On U.S.-China crisis stability, see Avery Goldstein, "First Things First: The Pressing Danger of Crisis Instability in U.S.-China Relations," *International Security*, Vol. 37, No. 4 (Spring 2013), pp. 49–89; Michael S. Chase, Andrew S. Erickson, and Christopher Yeaw, "Chinese Theater and Strategic Missile Force Modernization and Its Implications for the United States," *Journal of Strategic Studies*, Vol. 32, No. 1 (February 2009), pp. 67–114; and Thomas J. Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and U.S.-China Security Relations," *Journal of Strategic Studies*, Vol. 35, No. 4 (August 2012), pp. 447–487.

tegic primacy.[7] China currently believes that it is both possible and desirable to maintain assured retaliation, despite U.S. pursuit of the capabilities necessary to achieve strategic primacy. China has retained its no-first-use policy while modernizing and modestly expanding its nuclear forces. Instead, China will alter how it implements its strategy of assured retaliation, increasing the capabilities for the "assuredness" of retaliation by increasing the number of missiles and warheads that can strike the continental United States. China is also allowing limited ambiguity over the application of its no-first-use policy, especially if the United States were to use conventional weapons to attack Chinese nuclear weapons or their supporting infrastructure.

Second, Chinese strategists are relatively and perhaps unexpectedly optimistic about U.S.-China crisis stability, now and in the future. Recent international relations scholarship has warned that the combination of mutual possession of nuclear weapons and conventional military asymmetry creates both risks of unintentional nuclear escalation and incentives for China and the United States to manipulate the risk of nuclear escalation for bargaining purposes during a crisis. By contrast, China's strategists believe that the interests at stake would be too low in any U.S.-China scenario for either side to create risks of nuclear escalation. Moreover, China's no-first-use policy means that only the United States would escalate to the nuclear level, which is unlikely, given its conventional military superiority over China. In addition, China is allowing limited ambiguity over its no-first-use policy to deter the United States from attacking China's nuclear forces with conventional weapons. With some exceptions, Chinese strategists are not worried that this ambiguity could be mistaken for Chinese preparations to actually use nuclear weapons first. Chinese strategists also dismiss U.S. concerns that implementing the AirSea Battle Concept could result in escalation, because they dismiss the possibility that China's nuclear capabilities could be unintentionally compromised by U.S. conventional attacks. Doctrinal materials suggest that the People's Liberation Army (PLA) has been planning to protect its nuclear forces and its command and control facilities from conventional attacks for at least a decade, which suggests that if the AirSea Battle Concept threatens China's nuclear weapons, it is not a novel threat.

Although its limited ambiguity over its no-first-use posture allows China to

7. "Strategic primacy" refers to a situation in which one country can insulate itself from the retaliatory nuclear strike of an adversary. See Kier A. Lieber and Daryl G. Press, "The New Era of Nuclear Weapons, Deterrence, and Conflict," *Strategic Studies Quarterly*, Vol. 7, No. 1 (Spring 2013), pp. 3–12, at p. 5.

retain a relatively small arsenal while seeking to deter conventional strikes on its nuclear facilities, this policy could backfire. Limited ambiguity not only increases the risks of nuclear escalation, a risk China appears willing to take given its relative optimism about crisis stability, but it could also increase U.S. suspicions that in a crisis China might abandon its no-first-use policy altogether. These suspicions may further energize U.S. development of the new triad and encourage U.S. planning for conventional preemptive strikes on China's nuclear arsenal, confirming Beijing's fears that Washington seeks absolute security at its expense. China may therefore find itself in the arms race that it sought to avoid through limited ambiguity over no-first-use.

These conclusions are based on a wide range of Chinese-language sources. To start, we have mined the open-source literature in China on military doctrine and nuclear strategy, including the PLA's most recent texts, such as the *Science of Military Strategy*.[8] We also make extensive use of one source that previous studies have not used, namely, more than sixty articles from *Foreign Military Arts* (*Waiguo junshi xueshu*), a journal published by the Department of Foreign Military Studies at the Academy of Military Science (AMS). In addition, we conducted interviews with military and civilian experts who work on nuclear strategy and arms control.[9] Taken together, these sources represent the views held by China's strategic community, including the Second Artillery, scientists and engineers, scholars affiliated with various PLA academies, and civilian scholars.

This article proceeds as follows. The following section reviews China's current nuclear strategy to provide a baseline for assessing recent Chinese views of U.S. nuclear strategy and forces. Next, we assess Chinese views of U.S. capabilities, including missile defenses and conventional long-range strike capabilities. In the following two sections, we examine the implications of Chinese views for changes in China's nuclear posture and U.S.-China crisis stability. In the crisis stability section, we analyze Chinese views of the potential for nuclear escalation created by the AirSea Battle Concept. We conclude by discussing the implications of our findings for policymakers and scholars seeking to understand China's approach to nuclear weapons.

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8. Shou Xiaosong, ed., *Zhanlue xue* [The science of military strategy] (Beijing: Jiefangjun chubanshe, 2013). *Zhanlue xue* is authored by the Strategy Department of the Academy of Military Sciences, which develops China's military doctrine. It reflects an authoritative assessment of strategic issues, but it is not an official statement of China's military strategy.
9. We were unable to interview planners or operators from the Second Artillery, China's strategic rocket forces.

China's Current Nuclear Posture

Within Western analysis, a rough consensus exists regarding the parameters of China's nuclear strategy. Since the founding of the People's Republic in 1949, China's senior political and military leaders have emphasized that nuclear weapons are principally useful for two purposes: deterring a nuclear attack and preventing nuclear coercion.[10] To be sure, the nuclear bomb has been seen as imparting other benefits, such as demonstrating China's status as a major power in the international community and serving as a source of national pride for the Chinese people. Importantly, senior Chinese leaders have never viewed nuclear weapons as a means for fighting or winning wars, conventional or nuclear. Finally, China's attitudes toward nuclear weapons have remained relatively constant from Mao Zedong to Xi Jinping.[11]

China has developed its nuclear policy and strategy based on these views about the utility of nuclear weapons. China's nuclear policy refers to a series of policy statements about the role of nuclear weapons in international politics and in China's own security policy that were made when China first exploded a nuclear device on October 16, 1964.[12] The most important elements of China's nuclear policy are its no-first-use pledge and unconditional negative security assurances not to use or threaten to use nuclear weapons against nonnuclear states or nonnuclear zones. Other components of China's nuclear policy include complete disarmament and the prohibition of nuclear weapons, as well as the desire to avoid arms races with other countries.

Although the pillars of China's nuclear policy were established in 1964, China did not provide an official description of its nuclear strategy until the publication of its 2006 white paper on national defense. It stated that China pursues a "self-defensive nuclear strategy" (*ziwei fangyu he zhanlue*). The two principles that make up this strategy are "counterattack in self-defense" (*ziwei fanji*) and the "limited development" (*youxian fazhan*) of nuclear weapons. Finally, China seeks to possess "a lean and effective nuclear force" (*jinggan*

10. Fravel and Medeiros, "China's Search for Assured Retaliation"; Chase, "China's Transition to a More Credible Nuclear Deterrent"; and Gompert and Saunders, *The Paradox of Power*.
11. Fravel and Medeiros, "China's Search for Assured Retaliation." See also Sun Xiangli, *He shidai de zhanlue xuanze: Zhongguo he zhanlue wenti yanjiu* [Strategic choices of the nuclear era: Research on issues in China's nuclear strategy] (Beijing: Zhongguo gongcheng wuli yanjiusuo zhanlue yanjiu zhongxin, 2013); and Shou, *Zhanlue xue*, pp. 230–232.
12. "Zhongguo renmin gonghe guo zhengfu shengming" [Declaration of the government of the People's Republic of China], *Renmin Ribao*, October 17, 1964, p. 1.

youxiao he liliang) as a "credible nuclear deterrent force" (*zhanlue weishe zuoyong*).[13]

Taken together, the views of China's leaders regarding the utility of nuclear weapons and the contents of the white paper outline a strategy of assured retaliation. This strategy uses the threat of inflicting unacceptable damage in a retaliatory strike to deter an adversary from attacking first with nuclear weapons.[14] That is, following a first strike, China would still have enough weapons to retaliate and impose unacceptable damage on its adversary. Differences exist in how Chinese experts label this strategy, but the basic content is the same, with some divergent implications for the number of surviving forces needed. According to Michael Chase, Chinese scholars have described China's strategy as "counter nuclear coercion" (Li Bin), "a type of minimum deterrence" (Shen Dingli and Yao Yunzhu), "minimum credible deterrence" (Teng Jianqun), "defensive deterrence characterized by the policy of no-first-use" (Sun Xiangli), "first-strike uncertainty" (Wu Riqiang), and "dynamic minimum deterrence" (Chu Shulong and Rong Yu).[15]

Consistent with China's nuclear policy and strategy, the PLA's doctrinal writings describe only one campaign for the use of China's nuclear forces, the "nuclear counterstrike campaign" (*he fanji zhanyi*). This campaign is described in the 2000 and 2006 editions of the National Defense University's (NDU's) *Science of Campaigns* and in the 1987, 2001, and 2013 editions of AMS's *Science of Military Strategy*, as well as in more limited circulation texts such as the *Science of Second Artillery Campaigns*.[16] The campaign describes how China would execute a nuclear strike after it had been attacked with nuclear weapons. The posture of China's forces, which includes relatively small numbers of ICBMs and the separate storage of warheads, is consistent with a singular campaign intended to launch only a retaliatory strike.

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13. *2006 nian Zhongguo de guofang* [China's national defense in 2006] (Beijing: Guowuyuan xinwen bangongshi, 2006).
14. Fravel and Medeiros, "China's Search for Assured Retaliation"; and Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton, N.J.: Princeton University Press, 2014).
15. Chase, "China's Transition to a More Credible Nuclear Deterrent."
16. Shou, *Zhanlue xue*; Gao Rui, ed., *Zhanlue xue* [The science of military strategy] (Beijing: Junshi kexue chubanshe, 1987); Peng Guangqian and Yao Youzhi, eds., *Zhanlue xue* [The science of military strategy] (Beijing: Junshi kexue chubanshe, 2001); Wang Houqing and Zhang Xingye, eds., *Zhanyi xue* [The science of military campaigns] (Beijing: Guofang daxue chubanshe, 2000); Zhang Yuliang, ed., *Zhanyi xue* [The science of military campaigns] (Beijing: Guofang daxue chubanshe, 2006); and Yu Xijun, ed., *Di'er pao bing zhanyi xue* [The science of Second Artillery campaigns] (Beijing: Jiefangjun chubanshe, 2004).

In general, China has sought to maintain the smallest possible force capable of surviving a first strike and being able to conduct a retaliatory strike that would inflict unacceptable damage on an adversary, at the time and place of China's choosing.[17] Rather than expend all of its nuclear forces in a single, massive retaliatory strike, China has structured its nuclear forces to conduct multiple waves of large- or small-scale retaliatory strikes.[18] As result, key principles in force development since 1980 have been "close defense" (*yanmi fanghu*) and "key-point counterstrikes" (*zhongdian fanji*).[19] Close defense refers to ensuring the survivability of China's forces, which first emphasized concealment and then mobility. Key-point counterstrikes refer to the means and methods of retaliation and how to inflict unacceptable damage on an adversary. Historically, Chinese planning has targeted population and industrial centers as well as soft military targets, such as military bases.

How much is enough for China? The answer to this question has always been relative to a potential adversary's capabilities, namely, those of the United States and the Soviet Union/Russia. Historically, China's leaders have lacked confidence in their ability to assure retaliation. At times, either China has lacked enough weapons or the weapons that it possessed were not sufficiently survivable.[20] By the mid-1990s, for example, China only possessed approximately twenty DF-5 ICBMs capable of reaching the continental United States. These missiles were liquid fueled, which increased the time required to prepare them for launch and reduced their reliability and survivability. The missiles were vulnerable to an enemy strike while they were being fueled, as were the fuel storage areas. China was also concerned about the reliability of its missile technology and the reconnaissance capabilities of its opponents. As a result, China sought to modernize its forces to increase survivability and penetrability. This included developing two road-mobile, solid-fueled missile systems, the DF-31 and DF-31A, as well as a submarine-launched variant, the JL-2, to be used aboard the new Type-094 class of ballistic missile submarines (SSBNs). China's first-generation Type-092-class SSBN armed with the JL-1 missile encountered so many technological challenges that it never conducted a single deterrent patrol.[21]

17. Sun, *He shidai de zhanlue xuanze*.
18. Yu, *Di'er pao bing zhanyi xue*, pp. 145, 147.
19. Gao, *Zhanlue xue*; Sun, *He shidai de zhanlue xuanze*; and Yu, *Di'er pao bing zhanyi xue*, pp. 303–304.
20. Wu Riqiang, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies*, Vol. 36, No. 4 (2013), pp. 579–614.
21. Hans M. Kristensen and Robert S. Norris, "Chinese Nuclear Forces, 2015," *Bulletin of the Atomic Scientists*, Vol. 71, No. 4 (July 2015), p. 82.

Since modernizing its arsenal in the 1990s, China now possesses roughly forty missiles capable of striking the continental United States and another twenty that could strike Alaska or Hawaii. Some of China's DF-5 ICBMs were recently equipped with multiple independently targeted reentry vehicles (MIRVs). Analysts estimate that ten of the twenty DF-5s were converted to a MIRVed variant capable of carrying three warheads. China therefore has the capability to strike the United States with approximately eighty-three warheads.[22] This number could increase when the submarine leg of China's nuclear arsenal becomes fully operational. China's historic lack of confidence in the robustness of its retaliatory capability creates an important baseline for how China assesses the United States' nuclear posture today. That is, China's strategists should be especially sensitive to changes in the strategic posture of the United States that could threaten China's retaliatory capability.

Chinese Views of the Nuclear Posture of the United States

China views U.S. missile defenses, conventional long-range strike, and intelligence, surveillance, and reconnaissance (ISR) developments as posing a serious challenge to its ability to maintain a "lean and effective" nuclear force. China's strategic community sees the United States as continuing to pursue strategic primacy or, in the words of Chinese analysts, "absolute security," ensuring one's own security at the expense of others and thereby escaping mutual vulnerability.[23] Some Chinese analysts had hoped that the new triad adopted in the 2001 *Nuclear Posture Review* was unique to either the Bush administration or the Republican Party; but the continued modernization of U.S. nuclear and conventional forces for strategic deterrence, despite President Obama's 2009 Nuclear Weapon Free World proposal and the stated goal of strategic stability with China in the 2010 *Nuclear Posture Review*, have reinforced pessimism in China about the prospects for strategic stability with the United States.[24]

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22. Ibid., p. 78.
23. On the concept of "absolute security" and the 2010 *Nuclear Posture Review*, see Saalman, "China and the U.S. Nuclear Posture Review," p. 15. See also Saalman, "Prompt Global Strike," p. 3, for a discussion of how subsequent developments have "renewed the urgency and focus" of Chinese perceptions of U.S. "absolute security."
24. See, for example, Luo Xi, "Meiguo he liliang shiyong zhanlue de xin fazhan" [New developments in the U.S. strategy for use of its nuclear forces], *Waiguo junshi xueshu*, No. 9 (2013), pp. 45–47; Sun Xiangli, "Zhongguo junkong de xin tiaozhan yu xin yicheng" [New challenges and a new agenda for Chinese arms control], *Waijiao pinglun*, Vol. 3 (2010), pp. 10–21; Li Meng and Ni Haining, "Yatai diqu 'daodan fangyu xitong' jianshe fenxi" [Analysis of the construction of the East Asian regional "missile defense system"], *Waiguo junshi xueshu*, No. 6 (2009), pp. 16–23; Lin

Examples of such pessimism are not hard to find. According to Sun Xiangli, a leading arms control expert, "While the U.S. reduces its nuclear arsenal, it still continues to preserve nuclear superiority over other nuclear powers and in its nuclear posture will maintain the basic characteristics of a warfighting strategy (*zhangzheng duikangxing zhanlue*)."[25] In particular, "In terms of the main role of nuclear weapons, employment policy, the development of strategic ballistic missile defenses and deployment of nuclear forces, the Obama administration has basically continued (*jicheng*) the content of earlier policies."[26]

Likewise, the *Science of Military Strategy* highlights the U.S. desire to maintain "absolute security," noting that the United States will not pursue disarmament so long as others possess nuclear weapons, even as it develops certain conventional capabilities to rely less on nuclear weapons. The book also emphasizes that there has been no fundamental change in the essence of U.S. nuclear strategy and that the United States has maintained the capability to rapidly expand its nuclear force. As a result, the book describes the United States as the "main target" (*zhuyao duishou*) in China's "nuclear struggle" (*he douzheng*) because the United States views China as its main strategic opponent and has "an increasingly serious influence on the reliability and effectiveness of China's nuclear counterstrike."[27]

The two U.S. capabilities that sustain China's pessimistic view of the prospects for strategic stability are ballistic missile defenses and CPGS. Chinese authors cited in this section frequently refer to U.S. "strategic deterrence" and China's "strategic missiles" as U.S. targets, without specifying whether they are referring to China's nuclear capabilities or its conventional ballistic missiles. We assume that these authors are referring to China's nuclear-tipped missiles.[28]

Ballistic missile defenses

China's strategic community views the U.S. development and deployment of ballistic missile defense capabilities as the most serious threat to China's nu-

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Zhiyuan, "Meiguo junshi fazhan dongxiang shuping" [Commentary on trends in U.S. military development], *Waiguo junshi xueshu*, No. 1 (2010), pp. 33–37; and Li Deshun, "Meiguo he zhanlue yanjiu" [Research on U.S. nuclear strategy], in Zhang Tuosheng, Li Bin, and Fan Jishe, eds., *He zhanlue bijiao yanjiu* [Comparative research on nuclear strategy] (Beijing: Shehui kexue wenxian chubanshe, 2014), pp. 43–81. See also Shou, *Zhanlue xue*, p. 171.

25. Sun, *He shidai de zhanlue xuanze*, p. 104.

26. Ibid.

27. Shou, *Zhanlue xue*, p. 171.

28. Only the Second Artillery's nuclear forces are described as part of China's strategic deterrent and have a strategic role. Its conventional missiles are part of China's long-range strike capability and have a warfighting role. See Shou, *Zhanlue xue*, pp. 228–232.

clear deterrent. Chinese analysts believe that the deployment of early warning systems and interceptors gives the United States a rudimentary missile defense capability against Chinese nuclear missiles. China's strategic community also expects the system to become more integrated and effective in the future. For many, the Obama administration has only slightly altered the Bush administration's missile defense plan, as U.S. missile defense has bipartisan support and is now a permanent feature of the strategic landscape.[29]

For China's strategic community, the diverse development and widespread deployment of missile defense interceptors and sensors indicate that the future U.S. missile defense system in East Asia is unlikely to be limited and could undermine China's deterrent. Chinese experts view the U.S. development of interceptor technology as demonstrating the viability of missile defenses,[30] as well as a U.S. interest in defeating countermeasures, such as decoys that China might deploy.[31] Many Chinese interlocutors also anticipated additional ground-based midcourse interceptor deployments in the United States following the June 2014 test of a new kill vehicle.[32] Radar systems such as the AN/TPY-2 land-based X-band radar are seen as reducing the effectiveness of missile defense decoys, one of the major missile defense countermeasures.[33] Radar deployments in Kyoto, rumored deployments to the Philippines, and an offer to deploy a Terminal High Altitude Area Defense battery to South Korea confirm Chinese suspicions that the United States is improving its capability to detect and track Chinese missiles, not just North Korean ones.[34] Analysts expect the components of the system to have implications beyond missile defense. As two scholars from the PLA Foreign Languages Institute note, they "may have surveillance and preemption (*xianzhi*) applications."[35]

Consequently, many Chinese assessments of the nascent U.S. missile defense deployments in East Asia anticipate the deployment of an integrated, multilayered system that enhances U.S. strategic deterrence at China's expense.

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29. See, for example, Sun, "Zhongguo junkong de xin tiaozhan yu xin yicheng," p. 15.
30. Kang Hao, "Meijun shinian zhanzheng qijian de wuqi zhuangbei fazhan" [Development of U.S. military combat capabilities over the next ten years], *Waiguo junshi xueshu*, No. 6 (2013), pp. 30–33.
31. Li Shuisheng and Wang Zhijian, "Meiguo daodan fangyu xitong de jianshe yu fazhan" [The construction and development of the U.S. missile defense system], *Waiguo junshi xueshu*, No. 6 (2012), pp. 1–4.
32. Authors' interviews, Beijing, 2014.
33. Ibid.; Li and Ni, "Yatai diqu 'daodan fangyu xitong' jianshe fenxi," p. 18; and Wu Riqiang, "China's Anxiety about U.S. Missile Defence: A Solution," *Survival*, Vol. 55, No. 5 (October/November 2013), pp. 29–52, at p. 38.
34. Li Bin, "China and the New U.S. Missile Defense in East Asia" (Washington, D.C.: Carnegie Endowment for International Peace, September 6, 2012).
35. Li and Ni, "Yatai diqu 'daodan fangyu xitong' jianshe fenxi," p. 17.

Chinese expectations of the system look beyond the United States' "phased, adaptive approach" to envisage a future worst-case scenario for China's deterrent. A 2012 article by scholars affiliated with the Second Artillery Command College examined a hypothetical U.S. campaign to defend the homeland against a missile attack based on the 2012 U.S. Joint Publication 3-01 "Countering Air and Missile Threats." In addition to operations relying on the U.S. missile defense system, the authors note that the campaign also included "offensive" antimissile operations such as the suppression of air defenses and attacks on missile bases.[36] All of these analyses suggest Chinese skepticism that the United States will maintain current limits on its missile defenses.[37]

China's strategic community draws two primary conclusions from the continued development of U.S. missile defenses. First, unsurprisingly, China views the continued advances of U.S. missile defense as posing a direct threat to its retaliatory capability and as evidence of the U.S. pursuit of absolute security more generally.[38] China's strategic community accepts the official justification of the system to counter ICBM attacks on the U.S. homeland and to protect U.S. forces abroad and allies from medium-range and short-range missile attacks.[39] The community does not accept the claim that missile threats in East Asia emanate exclusively from North Korea, however.[40] Most interlocutors commented that the missile defense capabilities deployed in East Asia far exceed the capabilities required to destroy North Korean missiles and could be used to defend the United States against a Chinese retaliatory strike.[41] As Sun Xiangli writes, "Because China's nuclear forces have maintained a limited scope for a long time, China is very sensitive to threats from strategic missile defenses. As long as strategic missile defenses develop without limit, China's limited nuclear deterrent will inevitably be challenged, and China must consider all kinds of steps to strengthen its nuclear deterrent."[42] Likewise, according to two scholars from the PLA Foreign Languages Institute, "The layout of the system's deployments completely target the attack tra-

36. Yang Yuxiang, Zhao Zhongqi, and Yang Shuxin, "Meijun fandao zuozhan tedian fenxi" [Analysis of the features of the U.S. military's antimissile warfare], *Waiguo junshi xueshu*, No. 1 (2012), pp. 55–57.
37. See also Saalman, "The China Factor," p. 243.
38. Li and Ni, "Yatai diqu 'daodan fangyu xitong' jianshe fenxi." See also Sun, *He shidai de zhanlue xuanze*; and Shou, *Zhanlue xue*, p. 171.
39. Lin Zhiyuan and Tian Miaomiao, "Meiguo junshi fazhan dongxiang shuping" [Commentary on trends in U.S. military development], *Waiguo junshi xueshu*, No. 1 (2011), pp. 32–36.
40. Saalman, "The China Factor," p. 229.
41. Authors' interviews, Beijing, 2014.
42. Sun, *He shidai de zhanlue xuanze*, p. 160.

jectories of Chinese and Russian missiles" and can "degrade the Russian and Chinese military deterrence capability."[43]

Second, for Chinese analysts, U.S. missile defense development demonstrates a desire and technical possibility to escape mutual nuclear vulnerability. Regardless of the technology's effectiveness, they fear that arms racing may result. As two scholars from AMS and NDU note, "The essence of developing missile defense is to search for a shield against nuclear weapons. Once it succeeds, it will trigger a deep and widespread military revolution and even change the nature of international politics. The United States is very clear about this." They speculate about the fundamental changes resulting from missile defense, if combined with a nuclear counterforce capability: "If the United States deploys a mature missile defense system, especially if it is paired with a first-strike nuclear capability, this will greatly increase the U.S. strategic deterrent capability."[44] Our interlocutors shared these views and expressed concern that the United States may be tempted to use its missile defense capabilities along with offensive conventional and nuclear arms to disarm other states. Even if the system is ineffective, they worried that missile defenses could be perceived as effective, triggering a regional arms race.[45]

Conventional Prompt Global Strike

Unlike its views on missile defense, China's strategic community has mixed assessments of the threat posed by U.S. conventional long-range strike capabilities to China's nuclear deterrent. Chinese scholars closely monitor U.S. development of all conventional capabilities that could carry out prompt or long-range strikes.[46] Although CPGS capabilities are seen as increasing the speed with which the United States could conduct an accurate but limited conventional attack, a majority of Chinese experts do not believe that such capabilities increase the willingness or ability of the United States to strike China's nuclear forces. They believe that imperfect targeting intelligence and the basing modes of China's forces would prevent the United States from conducting a disarming first strike with conventional (or nuclear) weapons. A minority of

43. Li and Ni, "Yatai diqu 'daodan fangyu xitong' jianshe fenxi," p. 17.
44. Li and Wang, "Meiguo daodan fangyu xitong de jianshe yu fazhan," p. 4.
45. Authors' interviews, Beijing 2014. See also Saalman, "China and the U.S. Nuclear Posture Review," p. 24.
46. Li Kuifeng and Jiao Liang, "Meijun zuozhan lilun de chuangxin yu fazhan" [Innovations and developments in U.S. military warfighting theory], *Waiguo junshi xueshu*, No. 5 (2013), pp. 15–18; Lin and Tian, "Meiguo junshi fazhan dongxiang shuping"; Fang Yong, "Meiguo weilai yuancheng daji xitong fazhan dongxiang" [Trends in the development of the U.S. future long-range strike system], *Waiguo junshi xueshu*, No. 11 (2012), pp. 45–49; and Saalman, "Prompt Global Strike."

experts were concerned that the United States could be more willing to gamble that China would not respond to a conventional strike on China's nuclear weapons with nuclear retaliation, or that it could use such capabilities for a limited "warning strike" on Chinese nuclear forces. Despite these mixed assessments, the PLA's nuclear planners have already concluded that, together with missile defenses, CPGS could weaken China's nuclear deterrent in the future.

Similar to its perceptions of U.S. missile defense, China's strategic community believes that long-range conventional strike capabilities could be used in a much more offensive and unlimited manner than the United States acknowledges. Chinese scholars note that missile launch sites and command and control facilities clearly fit the description of the mobile, deeply buried and hardened, or fleeting targets that CPGS capabilities are intended to attack.[47] Chinese experts emphasize the speed of U.S. CPGS capabilities more than their range. One AMS scholar also suggests that in a time-sensitive situation or at the beginning of a conflict, CPGS capabilities could be used to attack targets that U.S. forward-deployed forces would not otherwise have the opportunity to attack because of their relatively slower reaction times. CPGS would thereby complement U.S. forces deployed in theater,[48] in addition to its primary role of providing the U.S. with a prompt, long-range strike capability that does not rely on forward-deployed forces.

Chinese experts writing about CPGS also worry that the United States could use CPGS capabilities as part of an unlimited war to defeat an adversary. PLA authors have examined Russian thinking about how the United States could employ the capability, in combination with ground forces and missile defenses, to defeat Russia. They cite Russian analysis that Russia's air defenses may not be able to defeat CPGS systems in the future and that in response Russia's only option would be to lower the threshold for the use of nuclear weapons to deter a U.S. attack.[49] If a formidable nuclear power is concerned that it could be defeated by CPGS capabilities employed as part of an unlimited conventional U.S. air and ground attack, unless it alters its nuclear strategy, Chinese analysts could conclude that it, too, may not be able to deter such an attack, given China's modest and restrained nuclear posture.

Although most interlocutors strongly doubted that the United States would

47. Lin and Tian, "Meiguo junshi fazhan dongxiang shuping."
48. Lin, "Meiguo junshi fazhan dongxiang shuping," p. 14.
49. Wang Chunsheng and Liu Na, "E yingdui Mei quanqiu kuaisu daji weixie de zhanlue sikao" [Russian strategic thought on the threat of U.S. prompt global strike], *Waiguo junshi xueshu*, No. 2 (2014), pp. 1–5.

ever want to attack China's nuclear arsenal with conventional weapons, a conventional attack on its nuclear forces would pose a challenge to its no-first-use policy. According to the *Science of Military Strategy*, a conventional attack on China's nuclear forces would "place us in a passive position, greatly influence our nuclear retaliatory capability, and weaken the effectiveness of our nuclear deterrent."[50] But if China were to retaliate with nuclear weapons, it would violate no-first-use. Chinese interlocutors indicate that the government has decided how to respond, but that it will not make that decision public, creating ambiguity over the application of its no-first-use policy under such circumstances.[51] One analyst argued that uncertainty about China's response would enable it to deter an attack while preserving the integrity of its no-first-use policy.[52] Some interlocutors suggested that if the consequences of a U.S. conventional attack were similar to those of a nuclear attack—destroying China's retaliatory capability, spreading radiation or being otherwise highly destructive—then China might retaliate with nuclear weapons.[53] Some interlocutors were less certain about China's likely response, especially in the case of an attack on Chinese command and control facilities, which include a number of installations of varying importance for China's retaliatory capability.[54]

At the same time, it is unclear whether CPGS poses an entirely novel threat to China's nuclear forces. Several doctrinal publications demonstrate that under the principle of "close defense," China has been preparing its nuclear forces and command and control facilities for a surprise nuclear or conventional attack since at least 2004. China relies on limited strategic warning to protect its nuclear launch capabilities and, in the case of air attacks, to launch air defense operations.[55] Chinese analysts also noted other constraints on a U.S. disarming first strike with conventional weapons. One implied constraint was the hardening of China's nuclear forces. According to Sun Xiangli, because they are designed to survive a nuclear strike, they could much more easily survive a more limited conventional strike.[56] Other analysts note that the constraint on a U.S. disarming strike on Chinese nuclear forces is not the

50. Shou, *Zhanlue xue*, p. 171.
51. Authors' interviews, Beijing, 2014.
52. Ibid.
53. Ibid.
54. Ibid.
55. Lu Lihua, ed., *Jundui zhihui lilun xuexi zhinan* [A guide to the study of military command theory] (Beijing: Guofang daxue chubanshe, 2004), p. 289; and Yu, *Di'er pao bing zhanyi xue*, pp. 355–372.
56. Sun, *He shidai de zhanlue xuanze*, p. 147.

speed, accuracy, or nature of the offensive weapon, but the lack of adequate U.S. intelligence to locate China's mobile or concealed missiles.[57]

Chinese strategists worry more that the speed of a CPGS strike could embolden U.S. decisionmakers than they worry about the reduced strategic warning China would have to protect its nuclear forces from a CPGS attack. Some interlocutors stated that the United States might be emboldened to attack China's nuclear arsenal if it had a rapid, conventional option to do so. One interlocutor described a situation in which U.S. leaders might be more tempted to authorize a conventional strike on a Chinese mobile missile that they had located but not identified as nuclear or conventional. More deceptively, the United States could state that it mistook a Chinese nuclear weapon for a conventional missile, and that it could keep making such "mistakes" to attrite China's nuclear deterrent.[58] Another interlocutor suggested that the United States might conduct a limited conventional attack on China's nuclear weapons with CPGS as a "warning shot,"[59] presumably to signal its capability and resolve to disarm China with conventional weapons if it did not accede to U.S. demands in a crisis or conflict.

Although these scenarios may not necessarily drive Chinese nuclear planning, they reflect a broader perception of CPGS as enabling the United States to use force more quickly and precisely in conflict situations. One scholar from the China Defense Technology Information Center claimed that the threshold for the use and the deterrent effect of CPGS capabilities is much lower than for nuclear weapons.[60] Threats to use CPGS are therefore more credible and more likely to be carried out if deterrence fails, but a CPGS attack would be less destructive than a nuclear strike. CPGS gives the United States another rung in the conventional escalation ladder, according to one AMS scholar: "Because it can achieve the same consequences as an attack with nuclear weapons, it can prevent a conventional war from escalating to a nuclear war."[61]

If paired with improved ISR capabilities, however, CPGS would reduce the strategic warning China currently relies on to protect its nuclear forces from an attack. One AMS scholar worried that if the United States could place strike capabilities, integrated ISR, and electronic warfare on the same platform, then

57. Authors' interviews, Beijing, 2014; and Li, "Tracking Chinese Strategic Mobile Missiles."
58. Authors' interviews, Beijing, 2014.
59. Ibid.
60. Fang "Meiguo weilai yuancheng daji xitong fazhan dongxiang," p. 48. See also Fu Zhengnan, "Meiguo wuqi zhuangbei fazhan zhanlue tiaozheng de zhuyao neirong" [Important changes to U.S. weapons development strategy], *Waiguo junshi xueshu*, No. 8 (2013), pp. 73–76; Luo, "Meiguo he liliang shiyong zhanlue de xin fazhan," pp. 45–47; and Saalman, "China and the U.S. Nuclear Posture Review," pp. 22–23.
61. Luo, "Meiguo he liliang shiyong zhanlue de xin fazhan," p. 47.

it could find and immediately destroy China's mobile missiles.[62] This capability would shorten the period of strategic warning that China would otherwise have if a U.S. strike platform had to be cued separately once an ISR platform identified a target.[63] China's strategic community frequently suggests that bombers may become the most important platform for strategic deterrence in the future because they would combine surveillance, electronic warfare, precision strike capabilities, and nuclear delivery systems into a single platform.[64] Chinese analysts also worry that a multirole U.S. experimental space plane, the X-37B, will enhance U.S. prompt global strike capabilities by reducing the targeting time and increasing the suddenness of a surprise attack.[65] The pivotal role of better ISR for targeting of China's mobile missiles may partially explain the mixed views of the CPGS threat to China's deterrent.

Regardless of whether analysts maintain that CPGS increases the threat to China's nuclear arsenal, most ranked it behind missile defense. CPGS is still under development, whereas missile defenses are being deployed. They were viewed as most threatening, however, when combined with the United States' improved ISR capabilities and ability to integrate and share information across the globe.[66] Such a system could solve the intelligence challenge of finding and tracking China's mobile, land-based ballistic missiles that China exploits to ensure survivability. Chinese interlocutors worried that the United States could eliminate China's nuclear deterrent if it possessed sufficiently accurate intelligence to conduct a disarming first strike with conventional or nuclear weapons and a missile defense system to destroy any remaining Chinese missiles launched in retaliation.[67] Interlocutors confirmed that PLA nuclear planners in the General Armaments Department believe that both CPGS capabilities and missile defenses would have a big effect on the size and operations of China's nuclear arsenal and thus Chinese assessments of the strength of China's deterrent.[68]

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62. Fu, "Meiguo wuqi zhuangbei fazhan zhanlue tiaozheng de zhuyao neirong."
63. Ibid.
64. Lin and Tian, "Meiguo junshi fazhan dongxiang shuping"; and Luo Xi, "Meiguo zhanlue he liliang jianshe de san xiang gaige cuoshi" [Three steps for reforming the U.S. strategic nuclear force structure], *Waiguo junshi xueshu*, No. 3 (2014), pp. 18–22, at p. 19.
65. Kang Hao, "Meijun shinian zhanzheng qijian de wuqi zhuangbei fazhan" [Development of U.S. military combat capabilities over the next ten years], *Waiguo junshi xueshu*, No. 6 (2013), pp. 30–33, at p. 32; and Xiao Yilin and Tang Cheng, "X-37B kongtian feiji jiqi junshi yiyi" [The X-37B space plane and its military significance], *Waiguo junshi xueshu*, No. 6 (2011), pp. 63–64.
66. Kang, "Meijun shinian zhanzheng qijian de wuqi zhuangbei fazhan"; and Fu, "Meiguo wuqi zhuangbei fazhan zhanlue tiaozheng de zhuyao neirong."
67. Authors' interviews, Beijing, 2014.
68. Ibid.

The Future of China's Nuclear Posture

China views developments in the U.S. strategic posture as posing a serious challenge to the robustness of its deterrent based on a "lean and effective" force. At the same time, China seeks to avoid a nuclear arms race with the United States, a lesson that many interlocutors claimed China had learned from the Cold War.[69] As a result, China must balance ensuring the robustness of its nuclear deterrent while avoiding an arms race. On the one hand, China is likely to maintain its strategy of assured retaliation. On the other hand, China will alter how it implements assured retaliation, allowing for limited ambiguity regarding its no-first-use policy and expanding the size and sophistication of its arsenal to ensure the survivability of its force.

China's nuclear policy and strategy

Chinese concerns about U.S. capabilities are likely to further underscore the ambiguity that China has allowed to persist regarding its no-first-use policy. In the mid-2000s, a debate over whether to maintain the policy occurred within China amid concerns about a future conflict over Taiwan's unification involving the United States. The debate was prompted in large part by the prospect of conventional strikes against Chinese nuclear capabilities and nonnuclear strategic targets, such as the Three Gorges Dam.[70]

Outside China, analysts closely monitored the debate for a number of reasons. The 2004 *Science of Second Artillery Campaigns* suggested that publicly lowering the threshold for the use of nuclear weapons would be one option that China could choose to deter conventional attacks against its nuclear facilities and other major strategic targets. Although any decision to alter the no-first-use policy would be made by China's top party leaders and not the commanders of the Second Artillery, this suggested change in China's declaratory policy garnered a great deal of attention from foreign analysts.

The result of this debate was that China maintained the no-first-use policy, but the debate itself created some ambiguity as to whether the pledge was, in fact, unconditional.[71] The creation of such ambiguity had a deterrent effect by forcing potential adversaries to assess the merits of conventional attacks on nuclear targets or perhaps even on nonnuclear strategic targets. U.S. sensitivity

69. Ibid.
70. Fravel and Medeiros, "China's Search for Assured Retaliation," p. 80; and Chase, "China's Transition to a More Credible Nuclear Deterrent," p. 61.
71. Fravel and Medeiros, "China's Search for Assured Retaliation," p. 81.

to possible changes in Chinese nuclear policy was revealed when the 2013 edition of China's defense white paper lacked an explicit reference to China's no-first-use pledge.[72] Nevertheless, to the degree that China views the United States as continuing to pursue strategic primacy, especially through its CPGS capabilities, China has strong incentives to maintain some ambiguity regarding the pledge. Moreover, the *Science of Military Strategy* indicated that such debates could strengthen China's deterrent. One tactic for strengthening China's deterrent is described as "expanding thinking" (*tuozhan silu*), in which "sometimes allowing different people to speak with different voices can have an even better deterrent effect than speaking with the same voice."[73]

Chinese sources indicate that China is unlikely to alter its nuclear strategy. That is, the pursuit of a lean and effective force to conduct a retaliatory campaign to deter a first strike against China remains the basis of China's nuclear strategy. Even though China is expanding the size and sophistication of its arsenal, sources and individuals consulted for this article indicate, in essence, that China will seek to achieve the goals contained in its current strategy and not pursue new ones, such as the ability to conduct a first strike on an adversary's nuclear weapons. As the *Science of Military Strategy* describes, "China's nuclear force employment follows the principle of 'striking after the enemy has struck' (*houfa zhiren*); a nuclear counterattack is the only type (*yangshi*) of combat employment for Chinese nuclear forces. The relative superiority or inferiority of China's nuclear counterattack capability directly influences the effectiveness of its nuclear deterrence. Therefore, the fundamental goals of the development of the Second Artillery are to effectively increase the number of missiles to ensure that a sufficient number are available for a nuclear counterattack, and to increase the effectiveness of an actual nuclear counterattack."[74] The main challenge from China's perspective is how best to achieve a secure second-strike capability in light of the continued development of missiles defenses and various long-range conventional strike capabilities.

The principal reason for maintaining the strategy of assured retaliation is that the views of China's leaders regarding the utility of nuclear weapons remain unchanged. That is, China's leaders continue to see nuclear weapons as being useful only for deterring nuclear coercion and nuclear attacks against

72. See James M. Acton, "Is China Changing Its Position on Nuclear Weapons?" *New York Times*, April 19, 2013; and M. Taylor Fravel, "China Has Not (Yet) Changed Its Position on Nuclear Weapons," *Diplomat*, April 22, 2013, http://thediplomat.com/2013/04/china-has-not-yet-changed-its-position-on-nuclear-weapons/.
73. Shou, *Zhanlue xue*, p. 173.
74. Ibid., p. 233.

China. In December 2012, for example, President Xi Jinping visited the Second Artillery's Eighth Party Congress and described the Second Artillery as being "the core of our country's strategic deterrence," echoing the language used by previous leaders.[75] Likewise, doctrinal materials published throughout the 2000s continue to refer to the nuclear counterattack campaign as the only campaign for China's nuclear forces and generally describe it in the same way. The emphasis on only one campaign for the use of China's nuclear weapons is consistent with long-standing views about the utility of such weapons.[76] The constraining effect of leadership beliefs could weaken if substantial changes in technology arise to enable a first-use posture, but these beliefs appear to be stable at present.

The structure of China's nuclear forces

In light of the continuity in its nuclear policy and strategy, China's main response to the U.S. pursuit of strategic primacy will be to develop its force structure to ensure a retaliatory capability. China is developing a larger force of more survivable ICBMs that are more capable of penetrating a missile defense system. It is also hedging against potential threats to its land-based ICBMs, including the new triad, by gradually developing SSBNs, researching missile defense and glide and hypersonic weapons technologies, and debating whether it should shift to a launch-on-warning posture.

One area of disagreement within China's strategic community concerns the size of China's retaliatory capability—that is, the size of the force needed to survive a first strike and inflict unacceptable damage on the United States. Based on Devin Hagerty's framework of "first-strike uncertainty," Avery Goldstein argued that during the Cold War the possibility that just one Chinese missile could hit the United States or Soviet Union was sufficient.[77] Wu Riqiang maintains that first-strike uncertainty remains sufficient for Chinese leaders and adversaries today.[78] Some interlocutors, however, indicated that China's criteria for the certainty of retaliation has changed over

75. "Xi Jinping: Jianshe qiangda de xinxihua zhanlue daodan budui" [Xi Jinping: Developing a strong and informationized strategic missile force], Xinhua news agency, December 5, 2015. On the statements of previous leaders, see Fravel and Medeiros, "China's Search for Assured Retaliation."
76. Peng and Yao, *Zhanlue xue*; Shou, *Zhanlue xue*; Wang and Zhang, *Zhanyi xue*; Zhang, *Zhanyi xue*; and Yu, *Di'er pao bing zhanyi xue*.
77. Avery Goldstein, *Deterrence and Security in the Twenty-first Century: China, Britain, France, and the Enduring Legacy of the Nuclear Revolution* (Stanford, Calif.: Stanford University Press, 2000), pp. 46, 111–138; and Devin T. Hagerty, "Nuclear Deterrence in South Asia: The 1990 Indo-Pakistani Crisis," *International Security*, Vol. 20, No. 3 (Winter 1995/96), pp. 79–114.
78. Wu, "Certainty of Uncertainty," p. 7.

time. One interlocutor expressed the view that, for China's current leaders to be satisfied with their deterrent, U.S. leaders would need to be certain that China could strike the United States with nuclear weapons.[79] Another interlocutor suggested that China's goal would be to strike an adversary with more than one weapon, while another suggested that at least ten missiles would need to be able to penetrate U.S. defenses.[80] In a recent track II dialogue, one Chinese participant estimated that the number of Chinese missiles needed to exceed the number of U.S. interceptors by 100, regardless of the number of interceptors deployed.[81]

Views on the appropriate size of China's force varied. Some interlocutors did not think that China would considerably expand its forces capable of striking the United States. For example, several experts indicated that China did not need to increase the size of its force, but could instead strengthen the concealment and mobility of its arsenal. Others, more plausibly, maintained that the size of the force capable of striking the United States might increase to 100 or 200 missiles. The number of missile defense interceptors deployed shaped assessments of how many missiles China needs. These views accord with a 2013 U.S. intelligence assessment that "the number of [Chinese] ICBM nuclear warheads capable of reaching the United States could expand to well over 100" by 2025.[82]

The *Science of Military Strategy* indicates that China will increase the size and sophistication of its ICBM force. Alluding to the United States, the book notes that "the geographic distance between China and its principal strategic opponent and nuclear counterattack adversary determines that the main component of the Second Artillery's nuclear missiles should be ICBMs. Increasing the number of ICBMs is a key way for the Second Artillery to increase its nuclear counterattack effectiveness." In addition, the book highlights missile defenses as the main reason for doing so. As the authors write, "It is an essential requirement that Chinese missiles are able to sufficiently and effectively penetrate the interceptors of an adversary's missile defense system and inflict real, destructive consequences on that adversary. Therefore, the Second Artillery must emphasize survivability and penetrability in the development of its

79. Authors' interviews, Beijing, 2014.
80. Ibid.
81. See Michael Glosny, Christopher Twomey, and Ryan Jacobs, "U.S.-China Strategic Dialogue, Phase VIII Report" (Monterey, Calif.: Center on Contemporary Conflict, Naval Postgraduate School, November 2014), p. 8.
82. National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat*, NASIC-1031-0985-13 (Dayton, Ohio: Wright-Patterson Air Force Base, 2013), p. 19.

missile forces."[83] The book notes the need to develop fast mobile launchers, gliders, and multiple warheads as well as newer missiles. With such enhancements, "China can strengthen the effectiveness of its nuclear counterattack due to overall improvements in the survivability and penetrability of its nuclear missiles."[84] Similarly, China's 2015 defense white paper stated that China would "improve strategic early warning, command and control, missile penetration, rapid reaction, and survivability and protection" of its nuclear forces.[85]

China is acting on these requirements. In 2014 the U.S. Department of Defense reported that China is developing a new mobile ICBM, the DF-41, which is "possibly capable of carrying multiple independently targetable reentry vehicles."[86] As noted earlier, China's nuclear arsenal now includes a MIRVed variant of the DF-5.[87] The kind of strategic warning improvements China will pursue remains unclear. At the moment, China's long-range air defense system "offers limited capability against ballistic missiles," particularly with shorter ranges, and China currently lacks a space-based early warning system.[88]

China's desire to defeat U.S. ballistic missile defenses creates a strong rationale for its SSBN program. Nevertheless, strategic, technological, operational, and organizational hurdles prevent a sea-based deterrent from becoming China's most survivable nuclear delivery system even if the navy soon starts deterrent patrols.[89] Chinese perceptions of the SSBN force are mixed. On the one hand, it is viewed as strengthening China's deterrent by increasing survivability and penetrating missile defenses. As the *Science of Military Strategy* explains, "Faced with the objective situation of the United States and countries on China's periphery actively developing missile defenses, developing China's sea-based deterrent force is significant for the reliability, credibility,

83. Shou, *Zhanlue xue*, p. 233.
84. Ibid., pp. 233–234. The term "multiple warheads" (*duo dantou*) likely indicates MIRV technology. The U.S.-China nuclear glossary translates MIRV as *fen daoshi duo dantou*. *Fen daoshi* means "separately targeted." See Committee on the U.S.-Chinese Glossary of Nuclear Security Terms, *English-Chinese, Chinese-English Nuclear Security Glossary* (Washington, D.C.: National Academies Press, 2008), p. 61.
85. *Zhongguo de junshi zhanlue* [China's military strategy] (Beijing: Guowuyuan xinwen bangongshi, 2015), section 4.
86. Office of the Secretary of Defense, *Annual Report to Congress, 2014: Military and Security Developments Involving the People's Republic of China* (Washington, D.C.: Office of the Secretary of Defense, 2014), p. 7.
87. Office of the Secretary of Defense, *Annual Report to Congress, 2015: Military and Security Developments Involving the People's Republic of China* (Washington, D.C.: Office of the Secretary of Defense, 2015), p. 32.
88. Ibid., pp. 34, 71.
89. Ibid., p. 9.

and effectiveness of protecting China's nuclear deterrent and counterstrike capabilities."[90] Although submarine-launched ballistic missiles can be used to overcome missile defenses,[91] many interlocutors acknowledged the vulnerability of China's SSBNs to U.S and Japanese antisubmarine warfare (ASW) capabilities.[92] One interlocutor noted that, because of their vulnerability, SSBNs would add nothing to China's deterrent and that several more decades of development were needed for Chinese SSBNs to be sufficiently quiet underwater.[93] Such concerns reflect long-standing debates within China about the advantages of SSBNs for survivability and penetrability, and the disadvantage of vulnerability to hostile ASW.[94] As the *Science of Military Strategy* explains, China's current SSBN force "has significant shortcomings in terms of both scale and quality, compared to developed countries." Furthermore, the navy "should speed up its research and fielding of new type strategic nuclear submarines to form a sea-based nuclear counterattack combat capability with a certain scale (*yiding guimo*)."[95]

One final option for China to counter the U.S. pursuit of strategic primacy is to develop its own conventional strategic capabilities.[96] In recent years, China has tested missile interceptor and boost glide technologies. These efforts align with PLA speculation that U.S. development of similar technologies may revolutionize strategic deterrence and form the basis of a future, post-nuclear strategic balance.[97] Despite this possibility, China's strategic community is also acutely aware of the dangers of China being drawn into an arms race with the United States.[98] China is unlikely to deploy these technologies in ways similar to those of the United States, if it deploys them at all.[99] For example, the *Science of Military Strategy* lists glide technology as a means of increasing the penetra-

90. Shou, *Zhanlue xue*, p. 214.
91. Wu Riqiang, "Survivability of China's Sea-Based Nuclear Forces," *Science & Global Security*, Vol. 19, No. 2 (July 2011), pp. 91–120, at p. 94.
92. Authors' interviews, Beijing, 2014; and Guo Qingbao, "Riben ziweidui fanqian zuozhan sixiang xianzhuang ji fazhan qushi" [Current thinking and development trends in Japanese Self-Defense Force antisubmarine warfare], *Waiguo junshi xueshu*, No. 6 (2012), pp. 46–49.
93. Authors' interviews, Beijing, 2014. According to a 2009 U.S. Office of Naval Intelligence report, the Type-094 SSBN was judged to be noisier than Soviet Delta III and Victor III submarines. See Office of Naval Intelligence, "The People's Liberation Army Navy: A Modern Navy with Chinese Characteristics" (Washington, D.C.: Office of Naval Intelligence, August 2009), p. 22.
94. Lu Qiming and Fan Ruiruo, *Zhang Aiping yu liangdan yixing* [Zhang Aiping and the two bombs and satellite] (Beijing: Jiefangjun chubanshe, 2011), pp. 443–445.
95. Shou, *Zhanlue xue*, p. 214.
96. See Saalman "Prompt Global Strike."
97. Li and Wang, "Meiguo daodan fangyu xitong de jianshe yu fazhan," p. 4.
98. Fu, "Meiguo wuqi zhuangbei fazhan zhanlue tiaozheng de zhuyao neirong," p. 75; and authors' interviews, Beijing, 2014.
99. See Saalman "The China Factor"; and Li Bin, "What China's Missile Intercept Test Means"

bility of China's nuclear deterrent. Current U.S. intelligence assessments confirm the link between China's glide technology development and nuclear rather than conventional missions.[100]

Regarding China's missile defense ambitions, our interlocutors indicated that missile defense technology and its role in China's strategic posture are still under development.[101] One interlocutor suggested that Chinese missile defense could be useful against a limited conventional strike on Chinese nuclear facilities, a "warning shot," but not against a disarming first strike. Another suggested that it could be used to protect Chinese cities in a nuclear exchange with the United States. Li Bin has argued that Chinese missile defenses could be used for point defense of Chinese nuclear facilities,[102] a role that would be consistent with China's assured retaliation posture.[103] Interlocutors also claimed that Chinese missile defenses could only be used to defend stationary targets, so they would not be used to protect mobile missiles. The *Science of Military Strategy* does not mention Chinese missile defenses. Despite China's own research and development into strategic defenses, ensuring its nuclear retaliatory capability remains the primary means of preventing U.S. strategic primacy.

LAUNCH-ON-WARNING

One source of ambiguity in the implementation of China's no-first-use policy is the ongoing debate in China regarding the pursuit of a launch-on-warning posture. Recent doctrinal publications and Chinese interlocutors indicated that the debate has yet to be resolved.[104]

On one side, some members of China's strategic community argued that a launch-on-warning posture would ensure the survivability of its nuclear deterrent if its opponent has robust targeting intelligence. The *Science of Military Strategy* states that a launch-on-warning posture "is in accordance with China's long-standing no-first-use policy, and may effectively protect China's nuclear forces from sustaining even greater losses, improving the surviv-

(Washington, D.C.: Carnegie Endowment for International Peace, February 4, 2013), http://carnegieendowment.org/2013/02/04/what-china-s-missile-intercept-test-means/fa45.

100. See NASIC analyst Lee Fuell, testimony before the U.S.-China Economic and Security Review Commission, *Hearing on China's Military Modernization and Its Implications for the United States*, January 30, 2014, p. 38, http://www.uscc.gov/sites/default/files/USCC%20Hearing%20Transcript%20-%20January%2030%202014.pdf.

101. Authors' interviews, Beijing, 2014.

102. Li, "What China's Missile Intercept Test Means."

103. Michael S. Chase, "Missile Defense with Chinese Characteristics," *China Brief*, May 23, 2013, pp. 10–13.

104. Authors' interviews, Beijing, 2014.

able nuclear counterstrike capability of China's nuclear missile forces."[105] China's first priority should be to prevent its adversary from precisely locating its missile launch positions. If China is able to reliably ascertain that an adversary has already launched nuclear missiles at China, however, China could quickly launch its nuclear missiles for a counterstrike "before the enemy has been able to actually inflict nuclear destruction."[106] Launch-on-warning would therefore provide China with an option for nuclear retaliation if a nuclear adversary were able to overcome Chinese efforts at concealment, deception, and mobility to ensure that its forces survived a first strike.

On the other side, several Chinese interlocutors claimed that a launch-on-warning posture would violate China's no-first-use policy. In a recent China-U.S. strategic dialogue, one Chinese participant noted that there were "ongoing discussions" about launch-on-warning in China, but expressed the view that "China was unlikely to adopt such an approach."[107] One interlocutor commented that text from the *Science of Military Strategy* quoted above was not widely accepted in China.[108] In practical terms, another interlocutor argued that China would not adopt a launch-on-warning posture for two reasons. First, China's nuclear arsenal is too small to be expended in a launch-on-warning counterattack. Second, China would not know whether the target of the incoming attack was a nuclear or a conventional one until the missile had reached its target. Unlike the United States, which has a forward-deployed early warning system, any Chinese early warning system would be on Chinese territory, so the period of time from detection of an incoming missile to that missile hitting its target would be very short.[109]

Prospects for U.S.-China Crisis Stability

China's continued commitment to a nuclear strategy of assured retaliation with a small but robust nuclear force structure avoids the wastefulness of Cold War arms racing. To deter U.S. conventional attacks on its nuclear forces, however, China relies on limited ambiguity over its no-first-use policy, which could make a future U.S.-Chinese crisis more dangerous. China appears willing to accept this risk because its assessments of crisis stability in the U.S.-China relationship are relatively optimistic, as outlined below. Even if Chinese analysts

105. Shou, *Zhanlue xue*, p. 175.
106. Ibid.
107. Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase VIII Report," p. 10.
108. Authors' interviews, Beijing, 2014.
109. Ibid.

accurately assess the nuclear risks present in a U.S.-China contingency, their optimism is unwarranted because it is not shared by the United States and because China likely underestimates U.S. assessments of the stakes in a potential crisis. Although the discussion below identifies Chinese views of the incentives that would be present in a crisis, how China would actually behave in a crisis cannot be predicted.

current arguments about u.s.-china crisis stability

China and the United States face an increasing number of issues over which a serious crisis could occur. In addition to Taiwan, which could become a more prominent source of tensions than it has been since the election of Ma Ying-jeou in 2008, other potential flashpoints include maritime disputes in East Asia that involve U.S. treaty allies or security partners as well as frictions over the freedom of navigation of U.S. military vessels within what China views as waters under its jurisdiction. The odds of escalation are enhanced because both sides may underestimate the interests at stake for the other and, because the status quo is not clearly defined, they may believe that they are acting defensively while the other is acting offensively revisionist.[110] Although recent analyses of U.S.-China security dynamics highlight many of the same factors contributing to crisis instability, they reach somewhat different conclusions about the effect of China's secure second-strike capabilitiy and U.S.-China mutual vulnerability on the potential for escalation to the nuclear level in a crisis.

In a recent article on the role of China's secure second-strike and coercive leverage, Thomas Christensen draws attention to the danger of inadvertent escalation in a crisis between the United States and China. In particular, Christensen challenges the optimistic view that China's secure second-strike capability will prevent escalation to the strategic nuclear level because each side would be able to impose unacceptable damage on the other after absorbing a first strike.[111] Drawing on the Cold War–era scholarship of Robert Jervis and Thomas Schelling, Christensen suggests that a conventionally weaker state with a secure second-strike capability could create a "threat that leaves something to chance," whereby any conventional conflict could ultimately

110. Christensen, "The Meaning of the Nuclear Evolution," pp. 463, 466, 472–474; and Goldstein, "First Things First," pp. 59–62.
111. Christensen, "The Meaning of the Nuclear Evolution," p. 449. See also Thomas J. Christensen, *The China Challenge: Shaping the Choices of a Rising Power* (New York: W.W. Norton, 2015), pp. 95–105.

escalate to strategic nuclear war.[112] The lack of a clear firebreak between conventional and nuclear operations enhances this risk of nuclear escalation. Conventionally weaker states may unintentionally increase the threat that leaves something to chance if their nuclear and conventional forces are integrated, and "fighting can become blurred between conventional and nuclear war."[113]

In a possible crisis between the United States and China, Christensen identifies how inadvertent escalation might occur. He suggests that China could be bolder in a conventional crisis with the United States because it believes it could counter U.S. threats of nuclear escalation.[114] Complicating matters, some of China's newly developed conventional systems overlap with its nuclear ones, especially land-based ballistic missiles and their attendant command and control infrastructure but also submarines and space-based assets. If a conflict between the United States and China occurred, Christensen notes that U.S. commanders could have strong incentives to attack China's mobile missiles and related assets to defend U.S. forces and ultimately prevail in a conflict.[115] If these strikes occurred, Beijing could mistakenly view them "as a conventional attack on its nuclear retaliatory capability or as a precursor to a nuclear first strike." As a result, "even a China that generally adheres to a No-First-Use posture might escalate to the nuclear level."[116] Christensen also highlights sections from the *Science of Second Artillery Campaigns* to show that "China's NFU [no-first-use] doctrine still allows for blurring of the firebreak between conventional and nuclear warfare."[117] The book, for example, indicates that China's nuclear forces create a means "by which to level the playing field with a stronger adversary" and suggests that China could lower its "nuclear deterrence threshold" under certain conditions, including "to compel the enemy to stop its war of invasion."[118]

Avery Goldstein analyzes the effects of asymmetric conventional capabilities

112. Christensen, "The Meaning of the Nuclear Evolution," pp. 450–451.
113. Ibid., p. 453.
114. Ibid., p. 481.
115. Christensen does not advocate for such strikes, but describes their possibility only to demonstrate how inadvertent escalation could occur, and how the risk of escalation increases China's coercive leverage, despite its conventional inferiority, by forcing the United States to think twice before launching major conventional strikes against China. Christensen also underscores the importance for China and the United States of better understanding the escalatory potential of conventional military operations against each other. See ibid., p. 483.
116. Ibid., p. 453.
117. Ibid., p. 475.
118. Ibid., pp. 475–478.

under the condition of mutual nuclear vulnerability on, among other factors, crisis stability. He identifies three incentives for states to use force first in a crisis: to gain a military advantage that could be translated into a coercive bargaining advantage, to signal resolve, or to preempt an attack.[119] Where both states have conventional and nuclear forces, nuclear weapons dampen the incentives for either state to use any kind of force in a crisis to gain bargaining leverage, even if one power has superior capabilities. Mutual possession of nuclear weapons does not, however, entirely eliminate incentives to use conventional force first in a competition in risk taking below the nuclear threshold, which could cross that threshold if miscalculation occurred.[120]

In the U.S.-China case, Goldstein suggests that crisis instability results from deliberate competition in risk taking for coercive bargaining, played out at the conventional level.[121] Each step in this competition is designed to bring the two states closer to nuclear conflict. For Goldstein, the stakes in a U.S.-China crisis would not be high enough for either side "to choose an unrestrained nuclear exchange." Nevertheless, he suggests that "some stakes might be high enough for either one to choose to initiate military actions that elevate the risk of escalation to such a disastrous outcome."[122] As the conventionally stronger power, the United States might use conventional force first to gain a bargaining advantage by eliminating China's ability to escalate using conventional weapons. China would then be required to move immediately to nuclear threats. As the conventionally weaker state, China could use conventional force first to preempt such a U.S. attack, or to signal its resolve over the issues at stake, but it could not improve its bargaining position by altering the balance of conventional forces.[123] Neither state would want to take actions that provoked certain nuclear retaliation, but such escalation could occur as the intensity of conventional bargaining escalated.[124]

current risks of intentional nuclear escalation

How does China actually assess the current risks of intentional nuclear escalation in a crisis or conflict with the United States? Chinese sources consulted for this article were more optimistic than Christensen and Goldstein about the current level of crisis stability in the U.S.-China relationship.

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119. Goldstein, "First Things First," pp. 74–76.
120. Ibid., pp. 84–87.
121. Ibid., p. 88.
122. Ibid.
123. Ibid., pp. 86–87.
124. Ibid., pp. 83–84, 87.

The most important factor in Chinese assessments of crisis stability is the stakes involved in the scenarios that could result in a crisis. Many interlocutors believe that mutual possession of nuclear weapons is sufficient to deter a high-intensity or protracted war and would therefore ensure that any U.S.-China crisis or conflict would be limited and controlled. For example, the *Science of Military Strategy* concludes that "in the present and long-term future, there is a miniscule (*shenwei*) possibility of an enemy initiating a large-scale ground invasion of China."[125] Some Chinese analysts also note that U.S.-China economic and political interdependence would further constrain the role of nuclear weapons in any future U.S.-China contingency.[126]

As a result, the most likely U.S.-China contingencies in which nuclear weapons could play a role would involve Taiwan or U.S. allies. In these conflicts, Chinese analysts believe that the stakes would not warrant the use of nuclear weapons by China (unless attacked first). They implicitly assume that the stakes would be too low for the United States, as well, and that Washington would either restrain or abandon its allies if defending them gave rise to a situation in which the United States would need to threaten to use nuclear weapons.[127] The general view was that the United States would not want to become entangled in a conflict with China on behalf of its allies or other states. One interlocutor suggested that Taiwan and North Korea were the only third-party contingencies over which the United States and China would be willing to risk a nuclear crisis. Nevertheless, this interlocutor maintained that China would not use nuclear weapons against the Taiwanese people and that the Chinese government had distanced itself from the remarks of a senior PLA officer who commented in 2005 that China would use nuclear weapons if it were defeated in a conventional war over Taiwan.[128] Another interlocutor was concerned about the possible spillover effect of a U.S. preemptive strike on North Korea's nuclear weapons. These Chinese views likely underestimate the strength of U.S. interests at stake in any conflict between a U.S. ally and China, as Christensen and Goldstein note.

Although tensions have eased across the Taiwan Strait in recent years, the possibility of U.S. involvement in a conflict over Taiwan remains a real concern

125. Shou, *Zhanlue xue*, p. 100.
126. Thomas Fingar and Fan Jishe, "Ties That Bind: Strategic Stability in the U.S.-China Relationship," *Washington Quarterly*, Vol. 36, No. 4 (Fall 2013), pp. 125–138.
127. Authors' interviews, Beijing, 2014.
128. These remarks were made at a time when China was debating the future of its no-first-use policy. See Joseph Kahn, "Chinese General Threatens Use of A-Bombs If U.S. Intrudes," *New York Times*, July 15, 2005.

for the PLA. The *Science of Military Strategy* acknowledges that cross-strait relations have improved, "but the key factors obstructing a solution to the Taiwan problem have not fundamentally disappeared."[129] As a result, the risk of a war over Taiwan's unification is "relatively high." The book states that such a war would be a relatively large-scale and relatively high-intensity conflict in which China would need to "guard against foreign military intervention" and that such a conflict would occur "against the background of nuclear deterrence."[130] Nevertheless, for the second reason below, most interlocutors did not believe that China would threaten or use nuclear weapons without being threatened or attacked first.

A second reason for a relatively optimistic view of crisis stability is the Chinese view that China's limited ambiguity over its no-first-use policy remains consistent with a clear firebreak between the use of conventional and nuclear weapons. China's strategic community maintains that China would not use nuclear weapons first in a crisis or conflict. A recent textbook from AMS, for example, describes one of the Second Artillery's main missions as "preventing (*ezhi*) an enemy from escalating a conventional war to a nuclear war."[131] In the context of a Taiwan contingency, Maj. Gen. Yao Yunzhu explains that "it would be useless for China to deter U.S. conventional intervention by using China's nuclear weapons. It is the United States, not China, which has the nuclear capabilities to control and even dominate conflict escalation."[132] Some Chinese interlocutors also claimed that U.S. conventional superiority contributes to a clear conventional-nuclear firebreak, as the United States would always have conventional options to escalate a conflict and would therefore not need to resort to nuclear threats or use.[133] Most interlocutors expressed confidence that the United States would have no reason to attack China's nuclear arsenal with conventional weapons, but some interlocutors recognized that nuclear escalation control was a part of U.S. war planning, despite the United States' conventional superiority.[134] If China views a conventional attack on its nuclear weapons or infrastructure as a first strike that

129. Shou, *Zhanlue xue*, p. 80.
130. Ibid., pp. 99–100.
131. Zhou Xinsheng, ed., *Junzhong zhanlue jiaocheng* [A course on military service strategies] (Beijing: Junshi kexue chubanshe, 2013), p. 204.
132. Yao Yunzhu, "Chinese Nuclear Policy and the Future of Minimum Deterrence," in Christopher P. Twomey, ed., *Perspectives on Sino-American Strategic Nuclear Issues* (New York: Palgrave Macmillan, 2008), pp. 111–124, at p. 119.
133. Authors' interviews, Beijing, 2014.
134. Ibid. The belief in a clear firebreak could produce overconfidence. This would lead to more risk-acceptant behavior with conventional forces, which could in turn result in nuclear escalation. See Goldstein, "First Things First."

would justify nuclear retaliation, its belief about a clear firebreak rests more on a belief that the United States will be deterred from initiating such an attack than it does on a principled constraint.

A third factor in China's optimistic assessment of crisis stability is the perceived deterrent effectiveness of the limited ambiguity that China has allowed regarding its no-first-use policy. Some strategists saw a greater temptation for the United States to attack China's nuclear capabilities with conventional weapons as U.S. conventional precision strike capabilities improved. All interlocutors indicated that China has carefully considered the possibility that the United States might use conventional force against China's nuclear capabilities. As discussed earlier, China's response has been to allow limited ambiguity over its no-first-use posture to deter such an attack. One interlocutor maintained that the United States did not believe that China would view an attack on China's command and control facilities as an attack on its nuclear facilities and that China could do little to deter such an attack. Chinese strategists have noted that identifying what constitutes a nuclear command and control facility is challenging given the different levels of command and control.[135] As a result, China is allowing the ambiguity surrounding its no-first-use policy in the hope that this will undermine U.S. confidence that China would not escalate a conflict if its nuclear capabilities were targeted.

current risks of unintentional escalation

Overall, Chinese strategists do not see a high risk of unintentional escalation, believing instead that the United States and China would tightly control any crisis or conflict to prevent escalation. Chinese interlocutors did not identify a risk of unintentional escalation if China acts on the assumption that nuclear escalation would only result from the deliberate decisions of either Chinese or American leaders to cross the nuclear threshold. Although interlocutors claimed that U.S. conventional superiority over China reduces the need for U.S. nuclear signaling toward China, they did suggest that China's reaction to any U.S. nuclear signaling or threats to China's nuclear capabilities could be unpredictable. For example, some Chinese interlocutors considered the March 2013 B-2 flight over South Korea as a signal of U.S. resolve to attack North Korea with nuclear weapons. One interlocutor indicated that if the United States were to engage in similar nuclear signaling against China, the signal might deter China but it could just as easily prompt China to escalate with

135. Authors' interviews, Beijing, 2014; and Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase VIII Report," pp. 16–17.

its own nuclear signaling to deter the United States from using nuclear weapons.[136] For example, some interlocutors suggested that China could take some of the signaling actions outlined in the *Science of Second Artillery Campaigns*, which are designed to respond to both conventional and nuclear threats to Chinese nuclear capabilities. Actions suggested by interlocutors included conducting missile tests, deploying SSBNs, placing road-mobile ICBMs on patrol, and raising the alert status of Chinese forces.[137]

At the same time, some awareness exists that China's own intentional nuclear signaling could unintentionally increase the risk of U.S. escalation as a result of misperceptions of China's intent. These Chinese concerns acknowledge the risk of unintentional nuclear escalation where "the reciprocal fear of surprise attack" creates incentives for states to use force first.[138] Those incentives are intensified where preparations for war, on the one hand, and steps to make an enemy attack less attractive or to protect oneself, on the other, are indistinguishable.[139] The *Science of Military Strategy*, for example, recognizes that signaling "to increase the effectiveness of nuclear deterrence and to carry out the actions of preparing for nuclear combat" could "push the nuclear adversary to escalate the conflict and ultimately give rise to a nuclear crisis."[140] The book acknowledges that an adversary would be sensitive to the activities and readiness of China's nuclear forces, even if they were intended to deter the adversary by "displaying China's firm resolve to implement a nuclear counterstrike."[141] The *Science of Second Artillery Campaigns* also recognizes the escalation risks of mistakes in nuclear signaling and signals that are too bellicose.[142]

Future risks of intentional escalation

How could the development of U.S. missile defense, conventional long-range strike, and ISR capabilities affect crisis stability in the future? Such develop-

136. Authors' interviews, Beijing, 2014.
137. Ibid. The interlocutors referred to Yu, *Di'er pao bing zhanyi xue*. One Chinese participant in a recent U.S.-China strategic dialogue made similar comments. See Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase VIII Report," p. 12. The steps outlined in *Di'er pao bing zhanyi xue* are similar to those listed by interlocutors, with the exception of "reducing the nuclear deterrence threshold (adjusting nuclear policy)," peacetime revelations of capabilities, and test launches close to enemy territory. See Yu, *Di'er pao bing zhanyi xue*, pp. 282–296.
138. See Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, Mass.: Harvard University Press, 1960) pp. 207–229. See also Chu Shuling, "He shidai Meiguo youxian zhanzheng sixiang lunzheng" [U.S. debates on limited warfare in the nuclear age], *Waiguo junshi xueshu*, No. 10 (2010), pp. 56–60, at p. 60.
139. Thomas C. Schelling, *Arms and Influence* (New Haven, Conn.: Yale University Press, 1966), pp. 225–227.
140. Shou, *Zhanlue xue*, p. 176.
141. Ibid.
142. Yu, *Di'er pao bing zhanyi xue*, pp. 280, 292.

ments could weaken China's deterrent and create doubts for China that it could retaliate against the United States with nuclear weapons in a crisis. If China's nuclear deterrent could be weakened or eliminated in a future crisis, China would face much stronger pressure to use its capabilities before they were destroyed, while the United States might be tempted to try to eliminate China's nuclear force with conventional weapons.

None of our interlocutors believed that U.S. pursuit of missile defenses, CPGS, or improved ISR capabilities would increase China's incentives to use nuclear weapons first. This belief is likely premised on the assumption that U.S. missile defenses will remain imperfect, such that China will be able to defeat them without abandoning its current posture of assured retaliation. Given their relative optimism about the scope and likelihood of future U.S.-China conflicts, Chinese strategists did not specifically articulate their concerns about the impact of U.S. missile defense, and the strategic primacy it may confer, on the role of nuclear weapons in a crisis.

Chinese views of whether China needs a launch-on-warning capability offer some clues as to the perceived effects of missile defense on crisis stability. If the United States deployed missile defenses sophisticated enough to overcome Chinese countermeasures to improve penetrability, China would then need to ensure that enough missiles to overwhelm U.S. missile defenses would survive a U.S. counterforce attack. Unless China substantially increases the size of its nuclear arsenal, sophisticated missile defenses could leave Chinese leaders with few options other than to move toward a launch-on-warning posture. Some PLA strategists have been advocating a shift to a launch-on-warning posture since the late 1980s.[143] As discussed earlier, however, Chinese interlocutors indicated that an internal debate exists regarding whether to adopt such a posture. A launch-on-warning posture would require the Central Military Commission to predelegate launch authority to Second Artillery brigades, which would loosen China's current centralized political control over the release of nuclear weapons.[144]

Views on the effectiveness of nuclear coercion enabled by U.S. missile defenses were also mixed. Chinese interlocutors implied that missile defense could return China to its 1950s position of vulnerability to U.S. nuclear threats, although they did not agree on the coercive impact of those threats.[145] One interlocutor argued that the only coercive leverage the United States has

143. Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security*, Vol. 20, No. 3 (Winter 1995/96), pp. 21–22.
144. This is, however, unlikely to be an insoluble problem, given that the PLA Navy likely faces similar command and control challenges in formulating an operational doctrine for its SSBNs.
145. Authors' interviews, Beijing, 2014.

over China comes from its conventional superiority rather than nuclear superiority.[146] By contrast, the *Science of Military Strategy* suggests that U.S. behavior toward China could be less constrained, and China would be less able to protect its national interests, if missile defenses were able to completely eliminate China's retaliatory capability. The authors explain that having a "fundamental nuclear counterattack capability" allows a state to "safeguard national interests," because nuclear weapons "have a latent influence and restriction on other countries' military activities."[147] Given China's long-standing view that assured retaliation is necessary to deter nuclear coercion or attack, China's current forces would no longer deter the United States if it achieved strategic primacy through the new triad.

Future risks of unintentional escalation

U.S. pursuit of strategic primacy is not the only current trend that could affect U.S.-China crisis stability in the future. The U.S. policy community is concerned that the AirSea Battle Concept will increase the likelihood of nuclear escalation. The AirSea Battle Concept reportedly includes a "blinding" phase during which U.S. conventional strikes would disable or destroy the ISR capabilities that China would use to direct its conventional missile and space capabilities against U.S. forces in the region.[148] Some analysts fear that such U.S. strikes could also damage nuclear missiles or infrastructure associated with Chinese nuclear forces that are colocated with Chinese conventional missiles and offensive space capabilities. China would then mistake the efforts to defeat its offensive conventional capabilities for a preemptive strike on its nuclear forces.[149]

China's strategic community does not share U.S. concerns about nuclear escalation from the implementation of the AirSea Battle Concept. Its members understand that the aim of the AirSea Battle Concept is to defeat Chinese "antiaccess" capabilities and involves a blinding campaign.[150] Nevertheless,

146. Ibid.
147. Shou, *Zhanlue xue*, pp. 172–173.
148. See Jan Van Tol et al., *AirSea Battle: A Point-of-Departure Operational Concept* (Washington, D.C.: Center for Strategic and Budgetary Assessments, May 18, 2010).
149. See, for example, T.X. Hammes, "Offshore Control: A Proposed Strategy for an Unlikely Conflict," INSS Strategic Forum (Washington, D.C.: National Defense University, June 2012); Douglas C. Peifer, "China, the German Analogy, and the New AirSea Operational Concept," *Orbis*, Vol. 55, No. 1 (Winter 2011), pp. 114–131; and Aaron L. Friedberg, *Beyond Air-Sea Battle: The Debate over U.S. Military Strategy in Asia*, Adelphi Book No. 444 (London: International Institute for Strategic Studies, 2014), p. 87.
150. Authors' interviews, Beijing, 2014. See also Zhang Junshe, "Dui Meijun 'Konghai Yiti Zhan' lilun de jidian kanfa" [Perspectives on the U.S. military's "AirSea Battle" concept], *Waiguo junshi*

most sources consulted for this article did not believe that AirSea Battle was relevant to Chinese nuclear weapons even though China's strategic community is aware of the U.S. debate over its escalation risks.[151] Curiously, the same CPGS capabilities that caused these experts to worry about the robustness of China's nuclear arsenal did not elicit the same concern over its nuclear arsenal in the context of an AirSea Battle Concept blinding campaign.[152] This view mirrors the apparent disconnect between China's concern about the U.S. new triad and relative optimism about crisis stability.

China's strategic community generally believes that if the United States implemented the AirSea Battle Concept in a conflict with China, the risk of escalation to the nuclear level would be low.[153] Our interlocutors' assessments indicated that Chinese analysts generally do not connect the AirSea Battle Concept with nuclear weapons, Chinese or American.[154] One AMS scholar acknowledged that the United States intended to use "new type[s] of forces," such as unmanned aerial vehicles, CPGS, and space and cyber capabilities, to reduce the firepower it would need to conduct deep strikes to implement AirSea Battle. The United States intends to use these capabilities to reduce the firepower required to execute deep strikes and thereby prevent escalation.[155] China's response to a U.S. campaign implementing AirSea Battle would depend on the nature of the conflict, but it is likely that China would have military options other than nuclear use. Interlocutors worried that the AirSea Battle Concept could trigger a conventional arms race, which accords with passages in the *Science of Military Strategy* implying that China's response to

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xueshu, No. 11 (2010), pp. 58–59; Fan Gaoyue, "Meiguo 'fangwu zhanlue zhinan' qianxi" [Analysis of the U.S. "defense strategic guidance"], *Waiguo junshi xueshu*, No. 2 (2012), pp. 1–4; Lin Zhiyuan, "'Li'an zhiheng': Meiguo jianqu caiqu de yizhong xin de da zhanlue" ["Offshore balancing": The U.S. is gradually adopting a new type of grand strategy], *Waiguo junshi xueshu*, No. 1 (2013), pp. 1–4; and Fang, "Meiguo weilai yuancheng daji xitong fazhan dongxiang."

151. Yu Xiaopeng, "Meijun 'Konghai Yiti Zhan' jinru zuzhi shishi xin jieduan" [U.S. "AirSea Battle" enters a new phase of organization and implementation], *Waiguo junshi xueshu*, No. 10 (2013), pp. 1–7; Yang Yujie, Guo Yilun, and Pang Xu, "Cong 'Kongdi Yiti Zhan' dao 'Konghai Yiti Zhan'—Meiguo Kongjun de lianhe zhilu" [From "AirLand Battle Concept" to "AirSea Battle Concept"—the path toward jointness for the U.S. Air Force], *Waiguo junshi xueshu*, No. 11 (2010), pp. 63–64; and Luo Xi, "Meiguo zhuanjia tichu 'li'an kongzhi' duihua xin gainian" [U.S. experts put forward the new concept of "offshore control" to defeat China], *Waiguo junshi xueshu*, No. 1 (2013), pp. 5–7.

152. At least one scholar recognizes that CPGS capabilities would be used to implement the AirSea Battle Concept: Fang, "Meiguo weilai yuancheng daji xitong fazhan dongxiang," p. 48.

153. Authors' interviews, Beijing, 2014.

154. Only one interlocutor was concerned that the AirSea Battle Concept could result in unintentional escalation because it involves attacks on command and control infrastructure. See authors' interviews, Beijing, 2014.

155. Yu, "Meijun 'konghai yiti zhan' jinru zuzhi shishi xin jieduan," p. 6.

many of the Concept's capabilities would be new nonnuclear capabilities and tactics.[156]

The most serious risk of escalation under the AirSea Battle Concept would be strikes on China's conventional missiles that are believed to be colocated with nuclear ones or that share the same command and control infrastructure. Many Western scholars claim that Chinese nuclear and conventional missiles, and command and control infrastructure, are indeed colocated.[157] By contrast, most Chinese experts believe that China's nuclear command and control infrastructure is separate from its conventional missile command and control facilities.[158] As a recent dialogue report notes, "The co-mingling of C2 [command and control] for nuclear and conventional forces was . . . denied."[159] These differences of opinion on the question of colocation may account for the different assessments of the nuclear escalation risks of the AirSea Battle Concept, although such assessments are inherently uncertain.

Open-source materials indicate that the majority of China's nuclear missiles are not colocated with conventional ones. As shown in map 1, missiles in the Second Artillery are organized into launch brigades under the control of six bases within China. Base 54 in Luoyang is exclusively nuclear, and Base 55 in Huaihua has one conventional cruise missile brigade, but all ballistic missile brigades are nuclear. Base 51 in Shenyang, Base 52 in Anhui, Base 53 in Kunming, and Base 56 in Xining have both nuclear missile launch brigades and conventional missile launch brigades of short and medium ranges.[160] As best we can tell, apart from one launch brigade in Xinjiang under the control of Base 56, where sources are indeterminate, no launch brigade contains both nu-

156. Authors' interviews, Beijing, 2014. According to the *Science of Military Strategy*, "[China needs to] continue to innovate a series of tactics to attack unmanned aerial vehicles, stealth technology, cruise missiles, carrier strike groups, and space platforms, and to defend against ISR, precision strike, cyberattacks, space attacks, and other new attack mechanisms," and "develop its special asymmetrical, contactless, and nonlinear warfare style (*fei duicheng, fei jiechu, fei xianshi zuozhan yangshi*)." See also Shou, *Zhanlue xue*, p. 101.

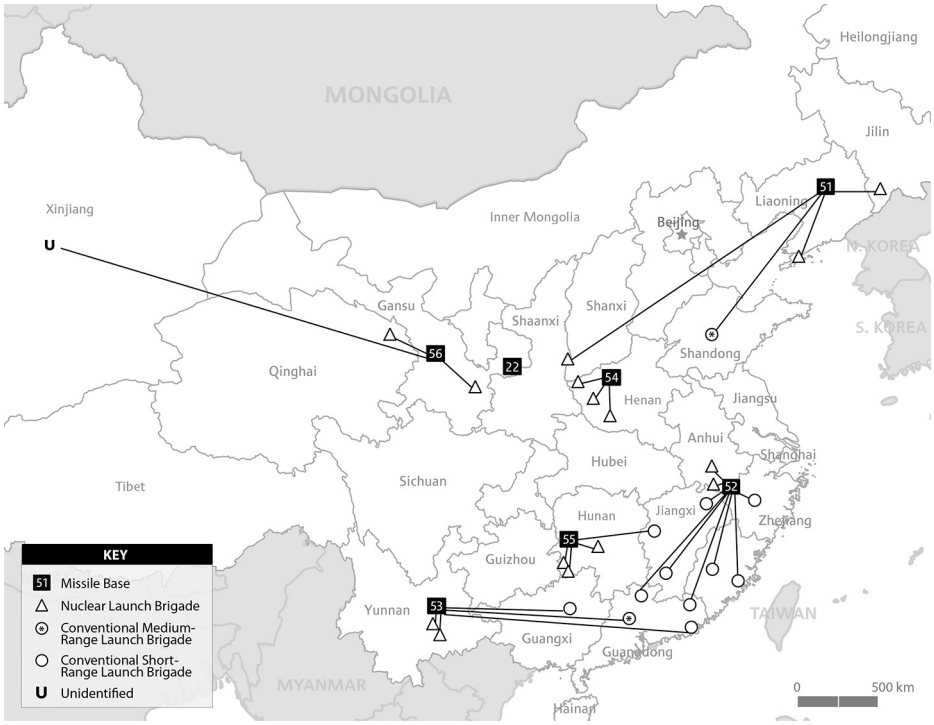
157. John Lewis and Xue Litai, "Making China's Nuclear War Plan," *Bulletin of the Atomic Scientists*, Vol. 68, No. 5 (2012), pp. 45–65, at p. 61. See also Christensen, "The Meaning of the Nuclear Evolution," p. 468; and Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase VIII Report," p. 10.

158. Authors' interviews, Beijing, 2014. See also Wu Riqiang, "Issues in Sino-U.S. Nuclear Relations: Survivability, Coercion, and Escalation," U.K.-China Strategic Communication Initiative paper (London: U.K. Foreign and Commonwealth Office, March 2013), p. 3.

159. Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase VIII Report," p. 10.

160. Mark A. Stokes, "The Second Artillery Force and the Future of Long-Range Precision Strike," in Ashley J. Tellis and Travis Tanner, eds., *Strategic Asia, 2012–13: China's Military Challenge* (Washington, D.C.: National Bureau of Asian Research, 2012), pp. 127–162, at pp. 136–138; and Jeffrey Lewis, *Paper Tigers: China's Nuclear Posture*, Adelphi Book No. 446 (London: International Institute for Strategic Studies, 2014), p. 116.

Map 1. China's Nuclear and Conventional Missile Bases and Launch Brigades



SOURCES: Ron Christman, "China's Second Artillery Force: Capabilities and Missions for the Near Seas," in Peter Dutton, Andrew S. Erickson, and Ryan Martinson, eds., *China's Near Seas Combat Capabilities* (Newport, R.I.: China Maritime Studies Institute, U.S. Naval War College, 2014); Department of Defense, *Directory of PRC Military Personalities, 2014* (Washington, D.C.: Defense Intelligence Agency, 2014); Jeffrey Lewis, *Paper Tigers: China's Nuclear Posture*, Adelphi Book No. 446 (London: International Institute for Strategic Studies, 2014), p. 116; Mark A. Stokes and Ian Easton, *Evolving Aerospace Trends in the Asia-Pacific Region: Implications for Stability in the Taiwan Strait and Beyond* (Washington, D.C.: Project 2049 Institute, May 17, 2010); Mark A. Stokes, "The Second Artillery Force and the Future of Long-Range Precision Strike," in Ashley J. Tellis and Travis Tanner, eds., *Strategic Asia 2012–13: China's Military Challenge* (Washington, D.C.: National Bureau of Asian Research, 2012), pp. 127–162; Mark A. Stokes, testimony before the U.S.-China Economic and Security Review Commission, *Hearing on China's Offensive Missile Forces*, April 2, 2015, http://www.uscc.gov/sites/default/files/Stokes%20USCC%20 Testimony%201%20Apr%202015.pdf; and various English and Chinese-language online open sources.

NOTES: No launch triggers are attached to Base 22, which is the Second Artillery's central warhead storage base. Nuclear launch brigades include either intercontinental or medium-range missiles.

clear and conventional missiles and no conventional and nuclear launch brigades are positioned in the same location. Earlier research also concluded that in Bases 51, 52, 53, and 55, "operational brigades are equipped exclusively with either nuclear or conventional missiles."[161]

Although conventional and nuclear launch brigades may share some support regiments at the base level, including warhead transportation and communications regiments, and may use some of the same physical infrastructure for command and control, they use different command and control chains. China's nuclear forces are commanded directly by the Chinese Military Commission through the Second Artillery headquarters in Beijing to each operational base command (*zuozhan jidi zhihui jigou*) and then the nuclear missile launch brigade commands. Conventional missile brigades are usually commanded via joint campaign commands located at the regional military commands responsible for conventional forces, and, under special circumstances, directly by the Commission to conventional missile brigade command.[162]

Doctrinal publications predating the AirSea Battle Concept indicate that China has been aware that its nuclear command and control facilities could be targeted and has outlined measures to protect them.[163] An NDU command and control textbook describes these measures to increase the survivability of Second Artillery campaign command and control posts. The authors note that to "ensure command and control is stable and uninterrupted," China generally takes the following measures: constructing hardened underground facilities "to resist a high-intensity firepower attack," establishing mobile command bases, and improving its warning systems to "increase the survivability of the campaign command and control post."[164]

China has also built redundancy into its nuclear command and control arrangements. In peacetime, the Second Artillery's coordination of multiple missile bases for the nuclear counterstrike campaign contains basic (*jiben*), reserve (*yubei*), and rear (*houfang*) command posts.[165] At the lowest level of alert, Level 3, only the basic command post is staffed. At Level 2, teams prepare to

161. Ron Christman, "China's Second Artillery Force: Capabilities and Missions for the Near Seas," in Peter Dutton, Andrew S. Erickson, and Ryan Martinson, eds., *China's Near Seas Combat Capabilities* (Newport, R.I.: China Maritime Studies Institute, U.S. Naval War College, 2014), p. 35.
162. Yu, *Di'er pao bing zhanyi xue*, p. 161; Glosny, Twomey, and Jacobs, "U.S.-China Strategic Dialogue, Phase VIII Report," p. 10; and authors' interviews, Beijing, 2014. Only the Central Committee and Central Military Commission can order the use of nuclear weapons. See Shou, *Zhanlue xue*, p. 228.
163. Lu, *Jundui zhihui lilun xuexi zhinan*, pp. 280–281. See also Yu, *Di'er pao bing zhanyi xue*, pp. 361–362.
164. Lu, *Jundui zhihui lilun xuexi zhinan*, pp. 280–281.
165. Yu, *Di'er pao bing zhanyi xue*, pp. 163–165.

enter the reserve and rear command posts, whereas at Level 1, all three command posts are manned and ready to receive orders.[166] When necessary, forward (*qianjin*) and direction (*fangxiang*) command posts may also be established.[167] The *Science of Second Artillery Campaigns* contains repeated references to establishing a reliable and redundant communications system using radio, relay, cable, fiber-optic, and satellite means.[168] In addition, the Second Artillery command and control infrastructure would respond in the same way to warnings of an incoming conventional or nuclear missile attack. According to the NDU textbook, "[Commands will be given for] wireless communication units to implement radio silence, units with tunnels or launch silos to quickly implement sealed, protected status; mobile combat units to quickly enter concealed territory to await an opportunity; and for command and other related units to quickly implement defensive combat plans and commence dispersion and concealment."[169] In the event that communications links are severed, the *Science of Second Artillery Campaigns* indicates that officer liaison groups (*junguan lianluo xiaozu*) would personally dispatch orders to missile units.[170]

The degree of Chinese nuclear and conventional commingling in practice is very difficult to assess using open-source materials. Although nuclear and conventional missile launch brigades may share some command and control infrastructure at the national or missile base level, the redundant nuclear command and control systems described above make it less likely that an attack on a conventional missile brigade would substantially degrade a nuclear missile brigade attached to the same base. Even so, a conventional attack on a Chinese conventional missile brigade would send a very strong signal to China of an adversary's ability to threaten Chinese nuclear forces. It would likely prompt China to take some of the actions listed above to demonstrate its resolve and ability to retaliate if its nuclear weapons are attacked. An increase in the degree of commingling of China's nuclear and conventional forces in the future may indicate China's efforts to intentionally increase the risk of nuclear escalation in the event of a U.S. conventional strike on its missile bases, whereas a decrease would indicate the priority China places on ensuring the survivability of its arsenal.

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166. Ibid., pp. 165–166.
167. Lu, *Jundui zhihui lilun xuexi zhinan*, pp. 279–280.
168. Yu, *Di'er pao bing zhanyi xue*, p. 349.
169. Lu, *Jundui zhihui lilun xuexi zhinan*, p. 289. For descriptions of defensive operations to protect Chinese nuclear weapons from enemy missiles, air strikes, airborne assault, or special operations attacks, see also Yu, *Di'er pao bing zhanyi xue*, pp. 355–372.
170. Yu, *Di'er pao bing zhanyi xue*, p. 312.

CHINESE BELIEFS AND THE REALITY OF CRISIS STABILITY

China's relative optimism about crisis stability, warranted or not, will not necessarily result in actual crisis stability, because the United States does not share this optimism. The key factor in differing U.S. and Chinese views of crisis stability is the degree to which each state believes that China will adhere to its no-first-use policy. China's views about crisis stability stem from its belief that neither China nor the United States will escalate to the nuclear level despite their different approaches to the usefulness of nuclear weapons in conflict. Nevertheless, China's embrace of limited ambiguity over its no-first-use policy to deter U.S. conventional attacks on its arsenal exploits U.S. suspicions that the policy would not be an effective constraint on first use more generally. Chinese strategists believe that limited ambiguity is an effective deterrent, a belief that contrasts with Western beliefs that clear nuclear thresholds are more effective because they reduce the risk of misperception of resolve and incentives for preemptive strikes.[171] In addition, Chinese analysts focus their assessments of crisis stability almost exclusively on the prospects for the intentional escalation to nuclear use in an existing conventional conflict, rather than unintentional escalation, in particular U.S. misperceptions of Chinese signaling during a crisis, which could be viewed as preparations for a Chinese first strike.

China's reliance on limited ambiguity regarding no-first-use has two important consequences, both of which confirm the strength of its commitment to maintaining an assured retaliation posture. First, China's reliance on limited ambiguity suggests that China is either ignoring or is prepared to accept a greater risk of crisis instability to avoid building a larger nuclear arsenal, which would be the other most likely alternative option for deterring U.S. offensive strikes on its nuclear forces. As Yao Yunzhu explains, "For a state adopting a no-first-use policy and intending not to waste too much money on unusable weapons, dependence on opaqueness to bring about greater deterrent value is a wise choice."[172] The United States, however, might be tempted to attack Chinese nuclear forces sooner or more decisively if it is unsure whether China will adhere to its no-first-use policy. For example, some U.S. analysts worry that the United States might mistake one of China's conventional DF-21 ballistic missile for its nuclear-tipped variant. Some Western analysts, such as Aaron Friedberg, conclude, for example, that such ambiguity

171. Schelling, *Arms and Influence*, pp. 47–48.
172. Yao Yunzhu, "China's Perspective on Nuclear Deterrence," *Air and Space Power Journal*, Vol. 24, No. 1 (Spring 2010), pp. 27–30.

means that China might even conduct limited nuclear warning strikes in the Pacific theater, escalating the conflict to de-escalate it.[173]

The United States would have much less reason to worry about and prepare for such contingencies if China had an unambiguous no-first-use policy. Moreover, Chinese strategists appear to be aware of this trade-off. As one AMS scholar notes, the United States is seeking "to enrich and improve its nuclear policy in order to effectively counter China's so-called 'nuclear ambiguity policy,' while at the same time preventing China's 'unintentional use of nuclear weapons,' ensuring the confrontation remains limited."[174] Thus, even though China is relatively optimistic about crisis stability, its desire to deter conventional strikes on nuclear forces through limited ambiguity about no-first-use could backfire. In particular, if the United States believes that China has expanded the roles its nuclear weapons are intended to play beyond deterring nuclear attacks or coercion, then the United States would have a greater incentive to pursue strategic primacy and even a more offensive conventional doctrine to counter Chinese nuclear forces.

Second, China's reliance on limited ambiguity about no-first-use may explain why China is particularly concerned about the long-term strategic impact of U.S. missile defenses. If U.S. missile defense is effective without a counterforce offensive strike on Chinese nuclear forces, missile defense could remove the option of strategic ambiguity for China's nuclear deterrent, leaving China with few options other than larger nuclear forces to ensure its retaliatory capability. This could draw China into the arms race it is trying so hard to avoid.

SUMMARY

Limited ambiguity is a potentially dangerous but not wasteful response to concerns about U.S. counterforce capabilities. Ambiguity strengthens deterrence by increasing the risk of crisis instability but not arsenal size. A larger arsenal would be a wasteful but not necessarily dangerous response to concerns about effective U.S. missile defenses. This approach strengthens deterrence by increasing arsenal size in a way that could initiate a costly arms race, but it does not affect fears of surprise attack and therefore the temptation to use force in a crisis. China's preferred approach of strategic ambiguity and concern about more effective future U.S. missile defenses implies that China sees the

173. See, for example, Friedberg, *Beyond Air-Sea Battle*, p. 86.
174. Yu, "Meijun 'Konghai Yiti Zhan' jinru zuzhi shishi xin jieduan," p. 5.

economic burden of arms racing as a bigger threat to its national security than the risk of nuclear use in a crisis with the United States.

Conclusion

Whether China will abandon its long-standing nuclear strategy of assured retaliation for a more offensive posture will be a critical factor in U.S.-China strategic stability. The continued development of a new triad in the U.S. strategic posture that emphasizes missile defenses and conventional counterforce capabilities, in addition to nuclear weapons, could create strong pressures for China to abandon its current nuclear strategy and relatively small nuclear force. Developments in the U.S. strategic posture have altered how China will implement its strategy of assured retaliation but not the strategy itself.

Although China's strategic community remains relatively optimistic that nuclear threats will not play a part in future U.S.-China crises or conflicts, China will not allow the United States to achieve strategic primacy and is therefore increasing the size and sophistication of its ICBM force. This combination of optimism and pessimism in China's reaction to U.S. capabilities is mirrored in the combination of China's relaxed assessment of the threat posed by the AirSea Battle Concept and anxiety over missile defense, long-range strike, and ISR capabilities. For the moment, China is more concerned about U.S. possession of capabilities that reduce its nuclear deterrent than it is about U.S. doctrinal developments such as the AirSea Battle Concept that might increase the odds of a U.S. attack on its nuclear forces. These strategic developments confirm Chinese fears that the United States seeks to neutralize China's deterrent and increase suspicion about U.S. intentions to contain militarily China's rise. Still, China's strategic community appears willing to depend on limited ambiguity to deter a U.S. conventional attack on its nuclear facilities, trusting that there is no U.S. interest in any foreseeable crisis with China that is sufficiently strong for it to risk possible nuclear retaliation. To avoid ending up in a costly nuclear arms race reminiscent of the Cold War, China is betting that the U.S. desire to avoid nuclear escalation is more important than U.S. interests in the region.

Several implications follow from this analysis. First, a diversity of views now exists within China's strategic community regarding the U.S. threat and how China should respond. The uncertainty about the future of the U.S.-China nuclear relationship, noted at the beginning of this article, extends to China's strategic community. Future research should monitor the divergence of Chinese views of the United States' intentions and the intentions communi-

cated by its capabilities. A consensus in China's strategic community that the United States has rejected mutual vulnerability with China may place additional pressure on China's efforts to keep its arsenal lean and avoid an arms race with the United States. Future research should also monitor Chinese ISR developments that could enable a launch-on-warning posture and changes in the degree of commingling of conventional and nuclear land-based missiles and infrastructure. Another topic for future research is the likely effect of U.S. strategic developments on the PLA's operational doctrine for its nuclear counterattack campaign. China's SSBNs will require their own operational doctrine, which poses new challenges for command and control and the interservice coordination of nuclear deterrence campaigns.

Second, even if China manages to prevent the United States from achieving strategic primacy, Chinese relative optimism that a future U.S.-China crisis would remain conventional may be misplaced. Chinese strategists are likely underestimating the strength of U.S. interests in possible crisis scenarios. To the extent that China's optimism depends on a perception that the stakes involved in any conflict are relatively low, and not worth risking nuclear conflict, U.S.-China interdependence may increase the likelihood of miscalculation by reducing incentives to strengthen crisis management.[175] In addition, Chinese strategists may overestimate the degree of control that Chinese and U.S. decisionmakers have over escalation. Chinese optimism is also premised on assessments that any escalation to nuclear threats or use would be intentional.[176] In their assessments of how China would respond to a signal of a U.S. threat to its nuclear arsenal, Chinese interlocutors assumed that China could distinguish between an intentional U.S. signal and an unintentional one. Although China may have internalized the Cold War lesson to avoid an arms race, it may not have internalized the lessons both superpowers learned of the dangers of Cold War nuclear crises. These findings should prompt more emphasis on the risks of unintentional nuclear escalation in future U.S.-China dialogues.

Third, the limited ambiguity that China has created over its no-first-use policy may backfire. It may deter the United States from attacking China's nuclear forces or infrastructure with conventional forces, but it could encourage the United States to assume the worst about how China might actually use its nuclear weapons in a crisis. What may appear to China as leveraging a threat

175. Goldstein, "First Things First," p. 58. On the need for improved crisis management, see Christensen, "The Meaning of the Nuclear Evolution," pp. 482–483.
176. See Goldstein, "First Things First," pp. 65–66.

of Chinese retaliation to deter the United States without increasing the actual risk China faces of nuclear conflict, because of its no-first-use policy, may in fact encourage U.S. preemptive strikes or serve to accelerate U.S. development of the new triad.

Put differently, China seeks to enhance deterrence against conventional strikes on its nuclear weapons without abandoning the restraint of no-first-use and assured retaliation more broadly. The combination of limited ambiguity and restraint may neither deter nor reassure. If China's limited ambiguity is perceived as a bluff because China still adheres to no-first-use under other conditions, then it will fail to deter. If China is perceived as abandoning or eviscerating its no-first-use policy, it will not reassure potential adversaries. In fact, no nuclear power with an assured retaliation posture to date has attempted to carve out such an exception. If nothing else, China's effort to add limited ambiguity to its nuclear strategy of assured retaliation indicates that China will not replicate the Soviet response to U.S. strategic pressure early in the Cold War.

Finally, China's reaction to the U.S. pursuit of strategic primacy should give policymakers cause for both optimism and concern. On the one hand, a qualitative and modest quantitative increase in a survivable, penetrable ICBM force to maintain assured retaliation is a reason for optimism about the future of U.S.-China relations because an arms race appears unlikely. The limited ambiguity regarding no-first-use is an exception, but a necessary one if China is to retain a strategy of assured retaliation in light of the conventional counterforce threat to its arsenal. It is not a first step toward abandonment of that posture. On the other hand, the limited ambiguity over no-first-use could allow the United States to conclude that China might be willing to abandon such a posture altogether. The United States may respond by increasing efforts to achieve strategic primacy in peacetime, effectively confirming China's suspicions about U.S. pursuit of absolute security at its expense.