

ISSUES & INSIGHTS
VOL. 22, SR8

OCTOBER 2022

PACIFIC FORUM
INTERNATIONAL

Next Steps for the US-China Strategic Nuclear Relationship

EDITED BY
DAVID SANTORO





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ISSUES & INSIGHTS

EDITED VOLUME

VOL. 22, SR 8 | OCTOBER 2022

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Introduction

David Santoro

In just a few years, the world witnessed “the expanding roots of [US-China] bilateral competition, which now covers security, economics, technology, and ideas about governance.” So wrote Evan Medeiros in the fall of 2019, reflecting on “The Changing Fundamentals of US-China Relations” in an article for *The Washington Quarterly*.¹

As US-China competition was both broadening and intensifying, however, there were still some hopes in Washington and Beijing that its roots would perhaps not expand into the nuclear domain. Significantly, around the time Medeiros published his article, several Chinese experts insisted during a US-China academic exchange that “insulating the strategic nuclear relationship from the broader, increasingly competitive bilateral relationship should be a joint Chinese-US goal.”² Others added that China and the United States have “numerous common interests [in this domain], including on nonproliferation and nuclear security.”³ Some US experts agreed.

That was in late 2019, and back then already, most experts (and officials) in the United States were skeptical that insulating the nuclear dimension of the US-China relationship was realistic. Despite Washington’s repeated invitations, Beijing continued to reject bilateral strategic nuclear dialogue even as major changes were underway in the Chinese military after Xi Jinping’s announcement two years earlier that China would begin major reforms to develop “world-class forces” by 2049.⁴ Beijing, of course, had assured that these reforms would not change its longstanding approach to nuclear weapons, which consisted of a retaliatory-only strategy (a no-first-use policy) and the minimum means of deterrence (a small arsenal). But evidence quickly piled up that China was close to possessing an effective nuclear triad, that it had adapted its posture to embrace nuclear warfighting more clearly (despite Beijing’s insistence to the contrary), and that it had gained considerable strength in and across

multiple domains—conventional, space, and cyber.⁵ China also continued to expand its nuclear arsenal, and if nuclear parity with (or superiority over) the United States or Russia was out of reach given their much larger forces, Beijing, at a minimum, appeared committed to reducing the gap or attaining “strategic equivalency,” all the while as it was rejecting arms control, which it considered to remain the responsibility of Washington and Moscow.⁶

Meanwhile, since the beginning of 2017, the United States had given up on the idea that it should wait for China to be ready to engage in nuclear dialogue and began making decisions to strengthen deterrence. The US decision in 2018 to, in the near term, modify a small number of existing submarine-launched ballistic missiles and, in the longer term, pursue a modern nuclear-armed sea-launched cruise missile, was made primarily with Russia in mind, especially given Moscow’s behavior since its annexation of Crimea in 2014. Yet China was an important driver as well.⁷ Similarly, the US decision in 2019 to withdraw from the Intermediate-Range Nuclear Forces (INF) Treaty was made in response to Russia’s violation of the treaty, but also because of China, which has an arsenal primarily composed of INF-range systems. Case in point: following its first flight test of an INF-range (conventional) missile shortly after the demise of the treaty, then US Secretary of Defense Mark Esper explained that “we want to make sure that we, as we need to, have the capability to deter Chinese bad behavior by having our own capability to strike at intermediate ranges.”⁸ China, of course, strongly criticized the US decisions to deploy new weapons and to withdraw from the INF treaty, adding that these decisions were motivated by the never-ending US quest for “absolute security.”⁹

In that context, insulating the nuclear dimension of the US-China relationship appeared well out of reach by late 2019, and the years that passed since have not created any more fertile ground to do so. The broader

¹ Evan S. Medeiros, “The Changing Fundamentals of US-China Relations,” *The Washington Quarterly*, vol. 42, no. 4, Fall 2019, p. 95.

² Discussions during the “China-US Academic Exchange on Strategic Nuclear Dynamics” run by the Pacific Forum and the China Foundation for International and Strategic Studies in Beijing on Oct. 29-30, 2019.

³ *Ibid.*

⁴ Xi initially announced his intentions to jumpstart military reforms at the 2013 Third Plenum of the Eighteenth Party Congress. Four years later, he said that the people’s armed forces should become “world-class forces” by mid-century. See Phillip C. Saunders, Arthur S. Ding, Andrew Scobell, N. D. Yang, and Joel Wuthnow (eds.), *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms* (Washington, DC: NDU Press, 2019).

⁵ Hans M. Kristensen and Matt Korda, “Chinese nuclear forces, 2019,” *Bulletin of the Atomic Scientists*, vol. 75, no. 4, pp. 171-178.

⁶ The terminology “strategic equivalency” was first used by Brad Roberts in his edited volume on *Major Power Rivalry and Nuclear Risk Reduction: Perspectives from Russia, China, and the United States* (Livermore, CA: CGSR, May 2020), p. 5. Chinese officials say that China will join the arms control process “when conditions are ripe,” i.e., when the United States and Russia reach nuclear levels close(r) to China’s.

⁷ Amy F. Woolf, “Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N),” Congressional Research Service, April 25, 2022.

⁸ US Secretary of Defense Mark Esper, as quoted in Michelle Nichols, “Russia, China Seek UN Security Council Meeting on US Missile Developments,” *Reuters*, Aug. 21, 2019.

⁹ This is a recurrent theme in US-China discussions. For background, see David Santoro and Robert Gromoll, “On the Value of Nuclear Dialogue with China – A Review and Assessment of the Track-1.5 ‘China-US Strategic Nuclear Dynamics Dialogue,’” *Issues & Insights*, vol. 20, no. 1, Nov. 2020.

relationship has deteriorated further in the aftermath of the COVID-19 pandemic and Russia's invasion of Ukraine, which began in early 2020 and early 2022, respectively.¹⁰ Meanwhile, the public revelation by independent organizations in 2021 of hundreds of missile silos in China suggests that Beijing is engaged in an extremely ambitious nuclear build-up, seemingly abandoning its longstanding minimum deterrence posture (and perhaps its retaliatory-only strategy as well).¹¹ To be sure, China is still, to this day, a long way from reaching nuclear parity with (or overtaking) the United States and Russia, but it has nonetheless apparently decided to "go big, fast" with its nuclear arsenal. These developments have had multiple negative spillover effects, including for US-China nonproliferation and nuclear security cooperation. That is why in the fall of 2022 pessimism is the order of the day when it comes to the US-China strategic nuclear relationship.

About the study

Conducted with the generous support of the Carnegie Corporation of New York, this study seeks to provide an in-depth analysis of strategic nuclear issues of significance to the bilateral relationship to pinpoint the challenges to, and opportunities for, improving the current state of affairs between Washington and Beijing. The study, in other words, aims to propose an assessment of key issues and, insofar as possible, solutions or mitigation measures to address US-China strategic nuclear problems, including those that are seemingly intractable. It is motivated by the idea that even (or perhaps especially) when stark pessimism dominates, it is essential to be clear about what is in "the realm of the possible" to improve the situation, and to act on it.

Written from a US perspective (and primarily by US authors) and intended to serve as a baseline for discussions at official or unofficial levels, the study consists of five papers.

Penned by David Logan, the first paper explores the evolution of US and Chinese nuclear strategies. Logan explains that going forward, and unlike in the past, "The nuclear dimension of the US-China relationship is likely to feature greater attention and competition in the coming years," adding that

"China's nuclear modernization and expansion may begin to drive US nuclear policy in new directions." He further highlights that there will be rising risks of both crisis escalation and arms racing before proposing ways the United States can try to "reduce the intensity of the competition, the scope of an arms race, and the likelihood of nuclear use."

The second paper, authored by Gerald Brown, discusses options to lay the groundwork for US-China arms control and risk reduction. Brown argues that arms control should not be seen through the typical prism of weapon numbers but as "one tool of many to reduce the risk of conflict, or mitigate destruction if conflict occurs"; the difference is important in the US-China context, given the disparity in nuclear forces. With this framework in mind, he explains that "US-Chinese arms control arrangements should focus primarily on qualitative components, behaviors, and norms to reduce first-strike incentives, promote common understandings of intentions and risks, improve predictability, and curb unintentional escalation pathways." Brown adds that the way forward in this area begins with confidence-building and risk reduction measures before getting to "Formal arms control arrangements," i.e., verifiable treaty-based agreements.

"This study seeks to provide an in-depth analysis of strategic nuclear issues of significance to the bilateral relationship to pinpoint the challenges to, and opportunities for, improving the current state of affairs between Washington and Beijing."

Written by Heather Williams, the third paper zooms in on the "P5 process," the diplomatic dialogue on nuclear affairs among the five permanent members of

¹⁰ The pandemic led to Washington and Beijing blaming each other over where (and how) the virus emerged as well as over the effectiveness and appropriateness of their response. Russia's invasion of Ukraine, meanwhile, further sank US-China relations because Beijing refused to condemn (or sanction) Moscow and, instead, blamed Washington for the war.

¹¹ The first batch of public evidence (there were several) suggesting that China may be engaged in a nuclear build-up emerged in June 2021. See Joby Warrick, "China is building more than 100 new missile silos in its western desert, analysts say," *Washington Post*, June 30, 2021.

the United Nations Security Council.¹² Williams contends that the future of the P5 will depend largely on developments in Ukraine and how each member responds to Russia's aggression. She sketches out five possible scenarios for the future—"collapse, pause and pivot, minimize, continue, and expand"—and makes recommendations for actions by Washington and Beijing. Williams argues that the United States and China "face difficult choices in how to engage the P5 process" because, on the one hand, they would both "benefit from continuing to lead within the process to demonstrate commitment" to disarmament, but, on the other, "there is diplomatic and political risk of engaging Russia because of potential political costs."

The fourth paper, authored by Duyeon Kim, stresses that the prospects for US-China cooperation to work toward bringing about denuclearization and peace on the Korean Peninsula are bleak because "North Korea is squarely focused inward" and "China...does not appear interested in cooperating with the United States..." Kim thus recommends that the United States "doubles down efforts with its allies and partners to deter future North Korean provocations while continuing to find opportunities to resume diplomatic talks with Pyongyang." She further argues that US-China strategic competition means that Washington and Beijing "will need to work separately to prevent a potential crisis on the Korean Peninsula," adding that this assessment does not "preclude the need for them to seek opportunities to work together..., even if, at present, that may be a bridge too far."

Penned by Miles Pomper and Sanjana Gogna, the final paper examines areas of US-China cooperation in nonproliferation and nuclear security. Characterizing cooperation in this domain "a bright spot in an increasingly dark power struggle between the two global giants and a looming civilian nuclear energy rivalry," Pomper and Gogna wonder whether these comparatively positive developments can endure in the foreseeable future. They admit that deepening and broadening such cooperation will likely prove "more challenging" going forward. Still, after detailing past US-China cooperation successes and ongoing challenges, they highlight several new, potentially promising areas for discussion, arguing

that Washington and Beijing "should recognize that they have shared interests" when it comes to nonproliferation and nuclear security.

The study's five papers, of course, do not cover the entire scope of the key strategic nuclear issues animating US-China relations now and in the future. They do cover much territory, however, and provide analytical clarity and practical solutions to difficult problems.

David Santoro,
October 10, 2022

¹² The P5 include China, France, Russia, the United Kingdom, and the United States, which are all recognized nuclear-armed states under the Nuclear Nonproliferation Treaty.

1

Intensifying US-China nuclear competition:

The evolution of US and Chinese nuclear strategies

David C. Logan

The deteriorating US-China bilateral relationship has been marked by a growing nuclear competition. Recent revelations about a major expansion and modernization of China's nuclear forces have fueled US concerns over China's intentions and goals in the nuclear domain. This paper reviews the evolution of US and Chinese nuclear strategies, examining their changes over time and the implications for the bilateral relationship.

The paper proceeds in three parts. First, it provides an overview of changes to US nuclear forces and strategy, including the development of ballistic missile defense capabilities, the ongoing modernization and recapitalization of the triad, and the pursuit of "flexible" nuclear options. It also identifies the role of security concerns, extended deterrence commitments, and Congressional politics in driving these developments. Second, it evaluates China's evolving nuclear forces and strategy, examining China's ongoing modernization and expansion of its nuclear arsenal. It also considers potential drivers of China's nuclear force development, including assuring a secure second strike capability, responding to the deteriorating US-China relationship, and promoting China's status as a great power. It concludes with a discussion of implications for the future and US policy.

US nuclear strategy

Throughout the Cold War, despite evolution in the precise size and composition of the US nuclear arsenal, the rough contours of US nuclear forces remained largely the same.¹ The United States deployed a large and diverse nuclear triad of advanced strategic systems. It accompanied these strategic forces with forward nuclear deployments, especially ground-based tactical nuclear weapons, which were not only intended to increase the combat capability of frontline troops, but also to enhance deterrence by linking these frontline troops to US strategic nuclear forces.²

Following the Cold War, the United States has gradually reduced the size of its nuclear forces and diminished the role they play in its national security strategy. The United States maintained a stockpile of more than 20,000 nuclear warheads from 1960 until 1990, but in four short years, from 1990 to 1994, it halved that stockpile size to 10,000. Over the next nearly two decades, the stockpile would continue to diminish, as would the number of deployed strategic forces, thanks in part to a series of bilateral arms reduction agreements with Russia.³ Successive administrations would further reduce the stockpile through unilateral reductions.⁴ Under the Presidential Nuclear Initiatives of 1991, the United States also withdrew all forward deployed ground-based nuclear weapons from abroad and ceased deployment of tactical nuclear weapons on surface ships and attack submarines. Under the Obama administration, the United States decided to "de-MIRV" all ground-based intercontinental ballistic missiles (ICBMs) and reduce the role of nuclear weapons in its national security strategy.⁵

US nuclear forces in the 21st century: Downsizing, but modernizing

Against this backdrop of de-emphasizing nuclear forces, the United States has nonetheless expanded and adjusted some of its strategic forces in ways that affect the US-China strategic relationship. Perhaps the most significant change was the US withdrawal in 2002 from the Anti-Ballistic Missile (ABM) Treaty and the subsequent development and deployment of strategic ballistic missile defense (BMD) capabilities. Signed in 1972, the ABM Treaty had for three decades prohibited Russia (Soviet Union) and the United States from deploying strategic ballistic missile defense systems, with the narrow exceptions of two BMD sites, one to defend the capital and one to defend ICBM silos. In 2002, the George W. Bush administration withdrew from the treaty, saying that "the ABM Treaty hinders our government's ability to

¹ For histories of (US) nuclear strategy, see Bernard Brodie, "The Development of Nuclear Strategy," *International Security*, Vol. 2, No. 4, Spring 1978, pp. 65-83; David Alan Rosenberg, "The Origins of Overkill: Nuclear Weapons and American Strategy, 1945-1960," *International Security*, Vol. 7, No. 4, Spring 1983, pp. 3-71; and Lawrence Freedman and Jeffrey Michaels, *The Evolution of Nuclear Strategy* (London, U.K.: Palgrave Macmillan, 2019).

² Richard Weitz, "The Historical Context," in Tom Nichols, Douglas Stuart, and Jeffrey D. McCausland, *Tactical Nuclear Weapons and NATO* (Carlisle, PA: US Army War College, 2012), pp. 3-12; and Paul Schulte, "Tactical Nuclear Weapons in NATO and Beyond: A Historical and Thematic Examination," in Tom Nichols, Douglas Stuart, and Jeffrey D. McCausland,

Tactical Nuclear Weapons and NATO (Carlisle, PA: U.S. Army War College, 2012), pp. 13-74.

³ Marc Trachtenberg, "The Past and Future of Arms Control," *Daedalus*, Vol. 120, No. 1, Arms Control: Thirty Years On, Winter 1991, pp. 203-216; and Amy F. Woolf, Mary Beth D. Nikitin, and Paul K. Kerr, "Arms Control and Nonproliferation: A Catalog of Treaties and Agreements," *Congressional Research Service*, 25 April 2022, pp. 6-25.

⁴ Hans M. Kristensen, "Obama Administration Announces Unilateral Nuclear Weapon Cuts," *Strategic Security* (blog), *Federation of American Scientists*, 11 January 2017, <https://fas.org/blogs/security/2017/01/obama-cuts/>.

⁵ Secretary of Defense Robert M. Gates, *Nuclear Posture Review Report* (Washington, D.C.: US Department of Defense, April 2010), p. 23.

develop ways to protect our people from future terrorist or rogue-state missile attacks.”⁶

The United States then formed the Missile Defense Agency (a successor to the earlier Strategic Defense Initiative and Ballistic Missile Defense Organization under previous administrations) and has since invested roughly \$200 billion in developing various BMD systems.⁷ The first layer of the homeland missile defense capabilities consists of the Ground-based Midcourse Defense (GMD) system.⁸ In addition to these US-based systems, the United States also developed and deployed a variety of interceptor and radar systems across East Asia, including Navy ships equipped with the Aegis ballistic missile defense system, Terminal High Altitude Area Defense (THAAD) batteries, and forward deployed early warning radar systems.⁹ The United States is also cooperating with Japan on the development of a next-generation missile defense interceptor.¹⁰

In addition to its investment in BMD systems, the United States has invested in new nuclear capabilities as part of its own ongoing modernization program. This program has included a significant recapitalization effort across the nuclear triad, which according to some analysts would cost over \$1 trillion over the program’s lifetime.¹¹ In addition, the United States has recently shown interest in more “flexible” nuclear options for regional contingencies, including a nuclear-capable submarine-launched cruise missile and new low-yield warheads for use on Trident submarine-launched ballistic missiles.¹²

Drivers: “Rogue” states, extended deterrence, Congressional politics

Over the last two decades, the US approach to nuclear weapons and other non-nuclear strategic

Next steps for the US-China strategic nuclear relationship

capabilities has been driven by several external and internal factors. This paper focuses on three especially relevant to the US-China strategic relationship.

The first driver is the requirement to deter and defend against nuclear strikes from emerging or possible nuclear-armed states such as North Korea or Iran.¹³ Although Chinese and Russian observers have frequently raised concerns about the impact of US BMD capabilities on their respective nuclear deterrents, US plans have explicitly stated that BMD capabilities are meant to protect against limited and emerging nuclear-armed states and not meant to target either Chinese or Russian strategic nuclear capabilities.¹⁴ However, uncertainty about the technical features and future scope of US BMD capabilities has generated serious concern in Beijing and Moscow.¹⁵

“In addition to its investment in BMD systems, the United States has invested in new nuclear capabilities as part of its own ongoing modernization program.”

The second driver is the need to maintain credible extended deterrence commitments. Although the end of the Cold War saw the removal of forward deployed ground-based nuclear weapons, US strategic nuclear forces have continued to play an important role in upholding US extended deterrence

⁶ “President Discusses National Missile Defense,” George W. Bush, President Remarks on National Missile Defense The Rose Garden, Washington, DC December 13, 2001, <https://2001-2009.state.gov/t/ac/rls/rm/2001/6847.htm>.

⁷ The Government Accountability Office reports that, from 2002 to 2018, the Missile Defense Agency (MDA) received \$152 billion to develop ballistic missile defense systems and that the MDA had requested an additional \$47 billion from fiscal year 2019 to fiscal year 2023. “Missile Defense: Assessment of Testing Approach Needed as Delays and Changes Persist,” Government Accountability Office, July 2020, p. 1.

⁸ “Layered Homeland Missile Defense,” US Department of Defense, June 22, 2020, <https://media.defense.gov/2020/Jun/22/2002319425/-1/-1/1/LAYERED-HOMELANDMISSILE-DEFENSE-FINAL.PDF>.

⁹ Kingston Reif, “US and Allied Ballistic Missile Defenses in the Asia-Pacific Region,” *Arms Control Association*, January 2019, <https://www.armscontrol.org/factsheets/us-allied-ballistic-missile-defenses-asia-pacific-region>.

¹⁰ Megan Eckstein, “MDA Director Says SM-3 Block IIA Ready for Production, Unrelated to Japan’s Decision to Back Out of Aegis Ashore,”

USNI News, 19 June 2020, <https://news.usni.org/2020/06/19/mda-director-says-sm-3-block-ii-a-ready-for-production-despite-safety-concerns-from-co-developer-japan>.

¹¹ *Approaches for Managing the Costs of U.S. Nuclear Forces, 2017 to 2046* (Washington, DC: Congressional Budget Office, October 2017).

¹² Thought, as of writing, the Navy’s FY2023 budget request eliminated funding for the nuclear submarine-launched cruise missile.

¹³ Charles L. Glaser and Steve Fetter, “National Missile Defense and the Future of US Nuclear Weapons Policy,” *International Security*, Vol. 26, No. 1, Summer 2001, pp. 40-92.

¹⁴ Regional ballistic missile defense capabilities, however, would play a significant role in intercepting theater missiles, regardless of their source. I thank David Santoro for this point.

¹⁵ For a discussion of Chinese concerns, see Tong Zhao, *Narrowing the US-China Gap on Missile Defense: How to Help Forestall a Nuclear Arms Race* (Washington, DC: Carnegie Endowment for International Peace, 2020), pp. 31-43.

commitments. In the 2018 *Nuclear Posture Review*, the United States said that it would both “[m]aintain integrated, flexible, and adaptable U.S. nuclear and non-nuclear capabilities” and “[c]ontinue to invest in missile defenses against North Korean missile threats.”¹⁶ Analysts sometimes raise concerns about “deterrence gaps” against potential adversaries and the need to develop new, more flexible nuclear capabilities.¹⁷ Concerns about the credibility of overseas commitments, among other considerations, have reportedly also stopped the United States from adopting a no-first-use policy.¹⁸

Finally, Congressional politics have encouraged investment in new nuclear weapons and related strategic capabilities. The nuclear modernization program initiated by the Obama administration and continued under Trump was initiated in part to secure Congressional support for the New Strategic Arms Reduction Treaty (New START).¹⁹ Members of Congress were explicit in connecting modernization to arms control. For example, Senator Bob Corker (R-TN) commented that, when the Senate voted to ratify New START, “there was no doubt [about the] tie between the two.” He stated that “the essence of this is that the modernization piece and the reduction in warheads piece go hand in hand.”²⁰ Congressional approval of New START was also tied to the development of BMD capabilities to satisfy important members of Congress.²¹ According to Nancy Gallagher, “Lack of true consensus and low public attention let members of Congress influence the shape, size, and speed of missile defense programs for reasons related as much to ideology and partisan politics as to national security.”²² Analysts have long recognized the influence of the “ICBM Caucus,” senators from states that host US nuclear weapons, in

promoting the expansion and modernization of the force.²³

China’s evolving nuclear forces and strategy

Chinese officials decided to pursue nuclear weapons at a January 15, 1955 meeting of the Chinese Communist Party’s Central Committee. That decision would culminate in the country’s first successful nuclear test on October 16, 1964.²⁴ China’s pursuit of nuclear weapons was driven largely by security concerns. In the 1950s, the United States had threatened China with nuclear strikes during the Korean War and the First Taiwan Strait Crisis.²⁵ Although the effect of those threats on the respective crises remains disputed, Chinese leaders resolved to pursue the bomb to prevent future attempts at “nuclear blackmail.”²⁶

Nuclear forces and strategy: From minimum deterrence to something more

For the first three decades following its first successful nuclear test, Beijing pursued a nuclear strategy of minimum deterrence, under which Chinese leaders believed that only a few nuclear weapons were sufficient for an effective deterrent. The country’s nuclear forces consisted of only a few dozen hulking, liquid-fueled ICBMs configured in silos or roll-out-to-launch modes. These missiles, based in fixed and known locations, required extensive and likely detectable launch preparations, making them particularly vulnerable to adversary disarming strikes. China’s nuclear forces were on very low levels of readiness, especially compared to those of the superpowers, and reportedly were only placed on alert once, in response to the roiling border

¹⁶ *Nuclear Posture Review*, 2018, US Department of Defense, Office of the Secretary of Defense, 2018, p. 37.

¹⁷ *Nuclear Posture Review*, 2018, US Department of Defense, Office of the Secretary of Defense, 2018, pp. x and 34; and Paul van Hooft, “The US and Extended Deterrence,” in Frans Osinga and Tim Sweijts, Eds., *Deterrence in the 21st Century—Insights from Theory and Practice* (Breda, The Netherlands: Netherlands Defence Academy, 2021), pp. 87-107.

¹⁸ David E. Sanger, and William J. Broad “Obama Unlikely to Vow No First Use of Nuclear Weapons,” *The New York Times*, September 5, 2016, <https://www.nytimes.com/2016/09/06/science/obama-unlikely-to-vow-no-first-use-of-nuclearweapons.html>; and Steve Fetter and Jon Wolfstahl, “No First Use and Credible Deterrence,” *Journal for Peace and Nuclear Disarmament*, Vol. 1, No. 1, 2018, pp. 102-114.

¹⁹ Jeffrey Mankoff, “The Politics of U.S. Missile Defence Cooperation with Europe and Russia,” *International Affairs*, Vol. 88, No. 2, March 2012, pp. 329-347.

²⁰ US Congress, Senate Committee on Foreign Relations, Status of U.S.-Russia Arms Control Efforts, Hearing, 115th Congress, 2nd Session, September 18, 2018, <https://www.govinfo.gov/content/pkg/CHRG-115shrg40370/html/CHRG-115shrg40370.htm>.

²¹ Jeffrey Mankoff, “The Politics of U.S. Missile Defence Cooperation with Europe and Russia,” *International Affairs*, Vol. 88, No. 2, March 2012, pp. 329-347.

²² Nancy W. Gallagher, “Congress and Missile Defense,” in Catherine McArdle Kelleher and Peter Dombrowski, Eds., *Regional Missile Defense from a Global Perspective* (Stanford, CA: Stanford University Press, 2015), p. 84.

²³ See, for example, Matt Korda, *Siloed Thinking: A Closer Look at the Ground-Based Strategic Deterrence* (Washington, DC: Federation of American Scientists, 2021), pp. 55-67; and William D. Hartung, “Inside the ICBM Lobby: Special Interests Or the National Interest?” *Arms Control Today*, Vol. 51, No. 4, May 2021.

²⁴ John W. Lewis and Litai Xue, *China Builds the Bomb* (Stanford, CA: Stanford University Press, 1991).

²⁵ Rosemary J. Foot, “Nuclear Coercion and the Ending of the Korean Conflict,” *International Security*, Vol. 13, No. 3, Winter 1988-1989, pp. 92-112; and M. H. Halperin, *The Taiwan Straits Crisis: An Analysis*, Memorandum RM-4803-ISA, January 1966.

²⁶ 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. 60-61.

conflict with the Soviet Union in 1969.²⁷ Although scholars have emphasized how the views of top leaders such as Mao Zedong helped to constrain China's nuclear forces and strategy, the country also faced several other institutional, technological, and resource limitations on its nuclear forces.²⁸ China did not develop the capability to strike the continental United States until the 1980s and some scholars have argued that Chinese strategists did not have confidence in the country's nuclear deterrent until the mid-1980s or later.²⁹

During these early years, the primary aims of China's nuclear strategy were to deter nuclear attacks and prevent nuclear coercion against China. Scholars have debated how precisely to characterize China's nuclear strategy, though they largely agree that China's perceived requirements for deterrence were much lower than those of the United States or the Soviet Union.³⁰ Bates Gill and others have characterized China's nuclear strategy as "minimum deterrence."³¹ Wu Riqiang and Avery Goldstein have discussed Beijing's strategy in terms of the "first strike uncertainty" confronting the adversary.³² Taylor Fravel and Evan Medeiros have described China's nuclear strategy as assured retaliation in which Beijing would develop a force sufficiently large, dispersed, hidden, and hardened that at least a few warheads could survive a disarming first strike.³³ Since acquiring nuclear weapons, the core elements of China's declaratory nuclear strategy have consisted of an unconditional no-first-use policy, under which China committed to not use nuclear weapons first under any circumstances; negative security assurances, according to which China promised not to use or threaten to use nuclear

weapons against non-nuclear weapon states; and a policy of not engaging in nuclear arms races.³⁴

In addition to these relatively narrow political and operational requirements, China confronted organizational, technological, and resource constraints, which further limited the scope of its nuclear forces and strategy for the first few decades. Shortly after the early successes of the first nuclear and hydrogen bomb tests, China's strategic weapons establishment plunged into the chaos of the Cultural Revolution.³⁵ The period was plagued by intense infighting, even leading to the murder and suicide of engineers and scientists who worked on China's nuclear and strategic missile programs.³⁶ The disruptions of the time also affected the pace and quality of missile production. According to Wu, "Plant 230, which is responsible for the production of the stabilizing platform for the DF-5s and CZ-2 space launch vehicles, had produced only seven platforms from 1971 to 1977. After the Cultural Revolution, they produced five platforms during the first half of 1978."³⁷ Even following the reform and opening-up programs, China's investment in its nuclear forces remained modest. According to one observer, "China has historically taken longer periods of time to develop, test, and deploy new nuclear weapons systems than the United States or Russia have on similar programs... [T]echnical experts attribute this to Chinese nuclear weapons procurement practices, which are characterized by small-batch manufacturing and modest, steady modification programs."³⁸

Over the past two decades, however, the size and capability of China's nuclear forces have grown

²⁷ Michael S. Gerson, *The Sino-Soviet Border Conflict Deterrence, Escalation, and the Threat of Nuclear War in 1969* (Alexandria, VA: Center for Naval Analyses, 2010), p. iv.

²⁸ 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.

²⁹ Wu Riqiang, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies*, Vol. 36, No. 4, 2013, pp. 606-610; and Thomas J. Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and U.S.-China Relations," *Journal of Strategic Studies*, Vol. 35, No. 4, 2012, pp. 452 and 461. Even far more recent nuclear exchange models involving China and the United States suggest low levels of survivability for China's strategic nuclear arsenal. See Wu Riqiang, "Living with Uncertainty: Modeling China's Nuclear Survivability," *International Security*, Vol. 44, No. 4, 2020, pp. 84-118; and Matthew Kroenig, *The Logic of American Nuclear Strategy: Why Strategic Superiority Matters* (Oxford: Oxford University Press, 2018), pp. 47-61.

³⁰ Jeffrey Lewis, *The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age* (Cambridge, MA: MIT Press, 2007).

³¹ Bates Gill, James C. Mulvenon, and Mark Stokes, "The Chinese Second Artillery Corps: Transition to Credible Deterrence," in James C. Mulvenon and Andrew N. D. Yang, Eds., *The People's Liberation Army as Organization* (Santa Monica, CA: RAND Corporation, 2002), pp. 510-586.

³² Wu Riqiang, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies*, Vol. 36, No. 4, 2013, pp. 579-614; Avery Goldstein, *Deterrence and Security in the 21st Century: China, Britain, France, and the Enduring Legacy of the Nuclear Revolution* (Stanford, CA: Stanford University Press, 2000), pp. 111-138.

³³ 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.

³⁴ Fiona S. Cunningham, M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2, 2015, pp. 7-50.

³⁵ Wu Riqiang, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies*, Vol. 36, No. 4, 2013, pp. 601-602.

³⁶ Gregory Kulacki and Jeffrey G. Lewis, *A Place for One's Mat: China's Space Program, 1956-2003* (Cambridge, MA: American Academy of Arts and Sciences, 2009), p. 12; and John Wilson Lewis and Xue Litai, *China's Strategic Seapower: The Politics of Force Modernization in the Nuclear Age* (Stanford, CA: Stanford University Press, 1994), pp. 147-149.

³⁷ Wu Riqiang, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies*, Vol. 36, No. 4, 2013, p. 602.

³⁸ Caroline S. Reilly, "Assessing the Prospect of China's Potential 'Sprint to Parity,'" in *Nuclear Scholars Initiative: A Collection of Papers from the 2011 Nuclear Scholars Initiative* (Washington, DC: Center for Strategic and International Studies, 2011), pp. 166-167.

significantly beyond those of the early era of minimum deterrence. Recent shifts in China's nuclear forces can be categorized into three types: qualitative, quantitative, and operational.

Qualitative shifts include China's emphasis on deploying more mobile, solid-fueled missiles, including some that can reportedly transit off-road and fire without pre-prepared launch sites. China has also equipped some of its ICBMs with MIRV-capability, increasing the penetrability and warhead-carrying capacity of these missiles.³⁹ China's latest missiles can also fire more accurately and more quickly, permitting them to strike mobile targets.⁴⁰ Crucially, the move to solid-fueled mobile missiles also coincided with the development and deployment of an extensive arsenal of conventional missiles. Though China has traditionally applied very different operational principles to its conventional and its nuclear forces, these new conventional missiles were grafted onto the Second Artillery, the military organization that operated its nuclear forces.⁴¹ Since then, China's missile forces have operated both nuclear and conventional systems and, more recently, truly dual-capable ones, such as the DF-26.

China is also expanding the size of its nuclear forces, though the pace and ultimate size of this expansion remain uncertain. With the development of a true triad alongside the expansion of the traditional ground-based force, China's nuclear forces will necessarily grow in number. The PLA's ground-based nuclear forces, traditionally the core of its nuclear deterrent, have grown from 33 to 40 missile brigades in just a few years, in the process likely increasing the number of nuclear-armed brigades by four.⁴² China has launched six nuclear powered

ballistic missile submarines (SSBNs), each of which can carry 12 submarine-launched ballistic missiles.⁴³ China has also re-assigned a nuclear role to its Air Force and is developing a next generation nuclear-capable strategic bomber. Most dramatically, China began construction sometime in 2020 and 2021 of three new silo fields which, together, may have as many as 360 new silos suitable for ICBMs.⁴⁴ These new silos potentially represent the single largest expansion in China's nuclear forces in history and even exceed the total number of ICBM silos operated by Russia.

More recently, there have also been hints of potential operational shifts, though credible and detailed open source information on this remains sparse. The 2021 Department of Defense (DOD) report on the Chinese military described China as increasing the alert status of its forces and possibly moving toward a launch-on-warning posture. As the latest DOD report on the Chinese military has assessed, "since 2017, the PLARF has conducted exercises involving early warning of a nuclear strike and launch on warning responses."⁴⁵ The move to a more permanent higher alert status might require greater decentralization of China's nuclear warheads handling infrastructure and practices.⁴⁶ The available evidence does not suggest that China has decentralized these systems, however, and what little information exists suggests a possible further centralization of warhead handling. For instance, changes to internal unit designators suggest that the reporting lines for warhead handling units may have been reassigned from the six missile bases to the centralized warhead storage and handling depot designated Base 67—though this greater bureaucratic centralization could also be the result of a greater dispersal of warheads to facilitate higher readiness levels.⁴⁷ Further, despite the

³⁹ For a review of China's nuclear systems, including some recent shifts, see *Annual Report to Congress: The Military Power of the People's Republic of China 2021*, Office of the Secretary of Defense (2021), pp. 60-63 and 90-94; and Phillip C. Saunders and David C. Logan, "China's Regional Nuclear Capability, Nonnuclear Strategic Systems, and Integration of Concepts and Operations," in James M. Smith and Paul J. Bolt, eds., *China's Strategic Arsenal: Worldview, Doctrine, and Systems* (Washington, DC: Georgetown University Press, 2021), pp. 125-158.

⁴⁰ *Chinese Tactics* (Washington, DC: Department of the Army, 2021), pp. B-4-B-5.

⁴¹ David C. Logan, "Are They Reading Schelling in Beijing? The Dimensions, Drivers, and Risks of Nuclear-Conventional Entanglement in China," *Journal of Strategic Studies*, 2020.

⁴² P. W. Singer and Ma Xiu, "China's Missile Force Is Growing at an Unprecedented Rate," *Popular Science*, February 25, 2020, <https://www.popsci.com/story/blog-eastern-arsenal/china-missile-force-growing/>; and Hans Kristensen, "China's Expanding Missile Training Area: More Silos, Tunnels, and Support Facilities," *Strategic Security* (blog), Federation of American Scientists, February 24, 2021, <https://fas.org/blogs/security/2021/02/plarf-jilantai-expansion/>.

⁴³ Tong Zhao, *Tides of Change: China's Nuclear Ballistic Missile Submarines and Strategic Stability* (Washington, DC: Carnegie Endowment for International Peace, 2018).

⁴⁴ Charles A. Richard, Statement before the House Appropriations Subcommittee on Defense, April 5, 2022, p. 5.

⁴⁵ *Annual Report to Congress: The Military Power of the People's Republic of China 2021*, Office of the Secretary of Defense (2021), p. 93; and 李忠 [Li Zhong] and 张帆 [Zhang Fan], "雪域战场演兵忙: 某旅冬训场营对抗演练目击记 [Snowy Battlefield Military Exercises Are Busy: Account of a Brigade's Winter Training Camp Confrontation Exercise]," 火箭兵报 [*Rocket Force News*], January 7, 2017, p. 1.

⁴⁶ In particular, this might require a greater decentralization of where warheads are stored and a greater centralization of the authority to equip them onto missiles. I thank Phillip C. Saunders for this point.

⁴⁷ For more on China's historic approach to warhead handling, see Mark Stokes, "China's Nuclear Warhead Storage and Handling System," *Project 2049 Institute*, March 12, 2010, https://project2049.net/documents/chinas_nuclear_warhead_storage_and_handling_system.pdf. For more on military unit cover designators (MUCDs), see "Cover Designation System for Military Units Explained," *PLA Corner* (blog), August 17, 2017,

development of the air- and sea-based legs of the triad, there is yet no indication that the educational institutions of the Air Force and Navy have developed training for their own service-specific warhead handling units.

The ultimate goals of China's ongoing expansion and modernization remain unclear. While China has been consistent and explicit about some of the principles of its nuclear strategy, including its no-first-use policy, negative security assurances, and commitment not to engage in arms races, the country nonetheless remains remarkably opaque in the nuclear domain. China provides no official information about the size, composition, capabilities, or location of its nuclear forces. Chinese officials and analysts have been largely silent about recent developments, occasionally dismissing the reports on new Chinese nuclear capabilities as "groundless allegation and vilification from the U.S. side," despite photographic evidence.⁴⁸ This lack of transparency has fueled speculation about the drivers and goals of China's ongoing nuclear expansion and modernization. The meaning behind many of the recent developments in China's nuclear forces are ambiguous as they could be consistent with several alternative explanations.⁴⁹ Recent changes to its nuclear forces might be an attempt to maintain a survivable second strike capability in the face of expanding US capabilities or might signal a significant departure from China's historically restrained approach to nuclear weapons and the adoption of a substantially more assertive nuclear strategy.⁵⁰ China's official silence invites outside observers to adopt worst-case assumptions about Beijing's nuclear goals.

Drivers: Survivability, geopolitics, and bureaucracy

<https://placornblog.wordpress.com/2017/08/17/designators-of-military-units-explained>. I thank Phil Saunders for the observation about the potential inverse relationship between administrative control and operational needs.

⁴⁸ See, for example, "US Predicts China Could Have 1,000 Nuclear Warheads by 2030," *Al Jazeera*, November 4, 2021, <https://www.aljazeera.com/news/2021/11/4/china-expanding-its-nuclear-arsenal-faster-than-anticipated-pentagon>; Joseph Trevithick, "China's Claim That Its Fractional Orbital Bombardment System Was A Spaceplane Test Doesn't Add Up," *The Drive*, October 18, 2021, <https://www.thedrive.com/the-war-zone/42779/chinas-claim-that-its-fractional-orbital-bombardment-system-was-a-spaceplane-test-doesnt-add-up>; and Foreign Ministry Spokesperson Wang Wenbin's Regular Press Conference on February 5, 2021, Ministry of Foreign Affairs of the People's Republic of China, February 5, 2021, https://www.fmprc.gov.cn/mfa_eng/xwfw_665399/s2510_665401/2511_665403/202102/t20210206_693611.html.

⁴⁹ James Cameron, "China's Silos: New Intelligence, Old Problems," *War On the Rocks*, August 12, 2021, <https://warontherocks.com/2021/08/beijings-silos-new-intelligence-old-problems/>.

China's more recent nuclear modernization and expansion appears to be influenced by at least three drivers.

The first, and most consistent with China's historical nuclear practices, is the desire to maintain the survivability of China's nuclear deterrent against what Beijing perceives as increasing external threats. Chief among these threats, according to Chinese experts, is US BMD capabilities. Chinese strategists and official sources consistently raise concerns that such capabilities might sufficiently improve and expand to credibly threaten China's deterrent.⁵¹ Recent nuclear exchange modeling suggests that China's nuclear forces may be unable to withstand a disarming first strike from the United States, especially if China's forces are at low levels of readiness.⁵² There are also concerns that US regional BMD deployments to partners and allies such as Japan, South Korea, and Taiwan could foster greater strategic cooperation between them, resulting in an "encirclement" and "containment" of China.

Second, and related to the first driver, is the general downturn in the bilateral US-China relationship. The bilateral relationship worsened due to several causes, including new US tariffs and the resulting trade war, brutal Chinese oppression in Hong Kong and Xinjiang, and the handling of the COVID-19 pandemic, among others. Increasingly, the relationship is characterized by stronger strategic competition and a greater "securitization" of the relationship.⁵³ This deterioration is seen not only in the diplomatic clashes and sharp language between US and Chinese officials, but also in more academic assessments. The Tsinghua University Institute of International Relations has constructed a Database of China-Great Power Relations which attempts to

⁵⁰ For some competing interpretations, see Lyle Goldstein, "Raising the Minimum: Explaining China's Nuclear Buildup," *Defense Priorities*, April 5, 2022, <https://www.defensepriorities.org/explainers/raising-the-minimum-explaining-chinas-nuclear-buildup>; and Matthew Kroenig, "Deterring Chinese Strategic Attack: Grappling with the Implications of China's Strategic Forces Buildup," *Atlantic Council*, November 2021.

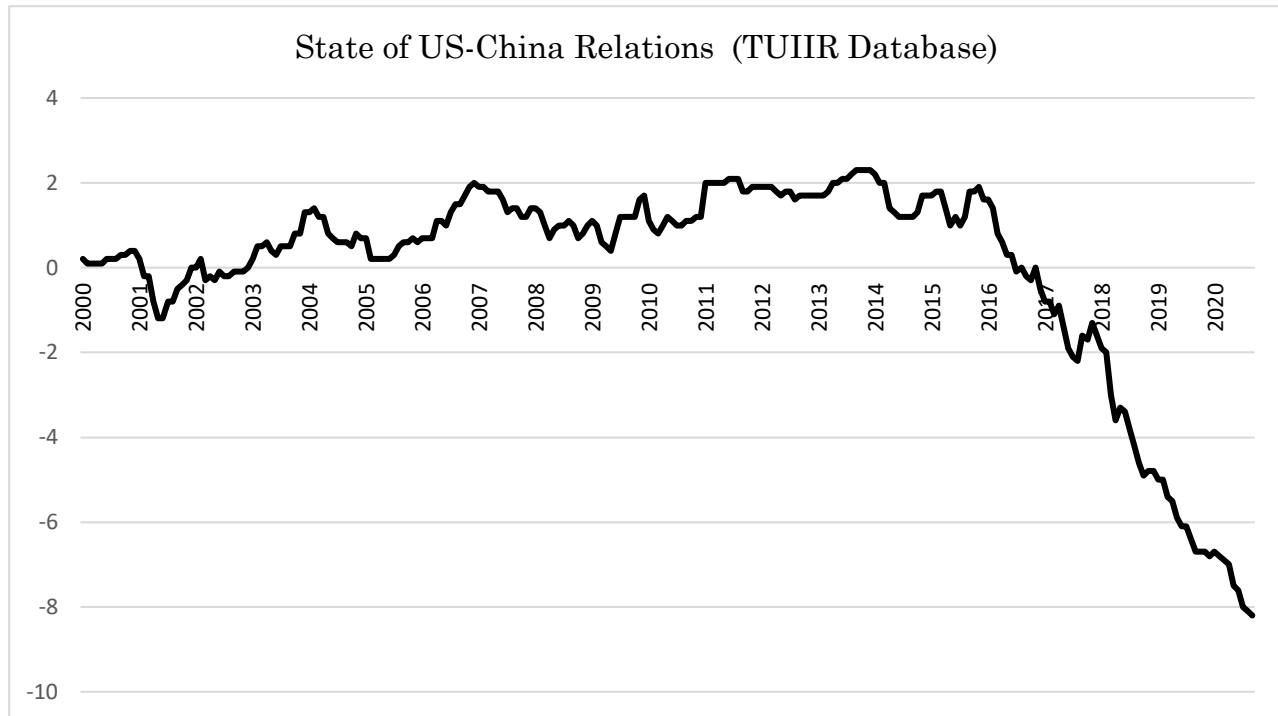
⁵¹ Tong Zhao, *Narrowing the U.S.-China Gap on Missile Defense: How to Help Forestall a Nuclear Arms Race* (Washington, DC: Carnegie Endowment for International Peace, 2020); and private communications with Chinese strategists, 2021 and 2022.

⁵² Wu Riqiang, "Living with Uncertainty: Modeling China's Nuclear Survivability," *International Security*, Vol. 44, No. 4, 2020, pp. 84-118.

⁵³ Phillip C. Saunders, "The Military Factor in U.S.-China Strategic Competition," in Evan S. Medeiros, ed., *Managing Strategic Competition: Rethinking US-China Relations in the 21st Century* (Washington, DC: Georgetown University Press, forthcoming); and Jessica Chen Weiss, "The China Trap: U.S. Foreign Policy and the Perilous Logic of Zero-Sum Competition," *Foreign Affairs*, Vol. 101, No. 5, September/October 2022.

quantify the state of relations between China and the world's other major powers.⁵⁴ The data from this initiative show that US-China relations have deteriorated rapidly since mid-2016 and are at the lowest level since the Korean War (see figure below). Worsening relations have raised the prospect of a conflict between China and the United States, sharpening concerns about nuclear weapons and perhaps providing political support to Chinese bureaucratic constituencies in favor of expanding the role of nuclear weapons.⁵⁵

Commissar of the Second Artillery wrote an article advocating that China “strive to build a capable and effective nuclear force commensurate with our country’s status as a major power” and that doing so would allow China to “enjoy a higher status and greater voice” in global affairs.⁵⁷ However, although past Chinese statements have sometimes associated the country’s nuclear weapons with its international standing, these associations appear to have accelerated in recent years. Since the Rocket Force’s founding in 2016, discussions of the country’s missile



Finally, there is growing evidence that China’s modernization and expansion of its nuclear arsenal is driven by considerations of status and prestige. Senior Chinese civilian and military leaders increasingly connect China’s nuclear forces to its status as a great power and authoritative Chinese sources frequently discuss the need to develop a nuclear force commensurate with the country’s growing international position.⁵⁶ These developments are not entirely new. For instance, in 2009, both the Commander and the Political

forces regularly include language connecting the force to the country’s status: “The Rocket Force is the core force of our country’s strategic deterrent, the strategic support for *our country’s great power status*, and an important cornerstone for safeguarding national security (火箭军是我国战略威慑的核心力量, 是我国大国地位的战略支撑, 是维护国家安全的重要基石)” [italics added].⁵⁸ Similarly, the 2020 edition of the People’s Liberation Army National Defense University’s *Science of Military Strategy* states that

⁵⁴ 中外关系数据 [Sino-Foreign Relations Data], 清华大学国际关系研究院 [Tsinghua University Institute of International Relations], <http://www.tuiir.tsinghua.edu.cn/kycg/zwxjsj.htm>.

⁵⁵ Tong Zhao, “What’s Driving China’s Nuclear Buildup?” *Carnegie Endowment for International Peace*, August 5, 2021, <https://carnegieendowment.org/2021/08/05/what-s-driving-china-s-nuclear-buildup-pub-85106>; Alastair Gale, “China Is Accelerating Its Nuclear Buildup Over Rising Fears of U.S. Conflict,” *The Wall Street Journal*, April 9, 2022, <https://www.wsj.com/articles/china-is-accelerating-its-nuclear-buildup-over-rising-fears-of-u-s-conflict-11649509201>; and Eric Heginbotham, Jacob L. Heim, and Christopher P. Twomey, “Of Bombs and Bureaucrats: Internal Drivers of Nuclear Force Building in China and the United States,” *Journal of Contemporary China*, Vol. 28, No. 118, 2019, pp. 538-557.

⁵⁶ For some discussion of these dynamics, see Susan Turner Haynes, “The Power of Prestige: Explaining China’s Nuclear Weapons Decisions,” *Asian Security*, Vol. 16, No. 1, 2020, pp. 35-52; and Nicola Leveringhaus, “The Politics of Nuclear Commemoration in Asia: The China Case,” presentation to the Australian National University, August 5, 2021, <https://www.youtube.com/watch?v=B6o-TM-exUM>.

⁵⁷ 二炮已初步形成核常兼备军事力量体系 [The Second Artillery Corps Has Formed a System of Nuclear-Conventional Dual Capable Military Forces], February 1, 2009, <http://mil.news.sina.com.cn/2009-02-01/1544540399.html>.

⁵⁸ “火箭军司令政委：增强可信可靠的核威慑和核反击能力 [Commander and Political Commissar of the Rocket Force: Enhance Credible and Reliable Nuclear Deterrence and Nuclear Counterattack Capabilities],” 新华网 [Xinhua News], January 31, 2016, http://www.xinhuanet.com/mil/2016-01/31/c_128688644.htm.

"We will strive to build a lean and effective strategic nuclear force *commensurate with China's international status* and commensurate with national security and development interests" [italics added].⁵⁹

Related to the increasing association of China's nuclear weapons with the country's status and prestige, there are also indications that some Chinese strategists might be attaching greater political and military utility to China's nuclear forces, expecting them to deter conflict generally, boost China's international status, and control the scope and intensity of war.⁶⁰ These roles expand beyond simply deterring and responding to a nuclear strike. Despite a possible expansion in the perceived value of nuclear weapons, there is no evidence that these views have yet translated into a greater willingness to *use* nuclear weapons.⁶¹ In fact, recent Chinese writings largely highlight the limits of nuclear forces, especially in comparison to their conventional counterparts. For example, the 2013 *Science of Military Strategy* published by the PLA Academy of Military Science stated that "China's nuclear deterrence may not be used for deterring nonnuclear hostile military activities, and its role in other nonnuclear military fields is similarly not distinct. Limiting the functional scope of nuclear deterrence to the hostile nuclear activities of other nuclear-armed states will result in further focusing of China's nuclear deterrence goals and functional scope."⁶² Similarly, in a section describing the concept and operation of deterrence, the 2020 edition of *Science of Military Strategy* published by the PLA National Defense University notes:

With the development of the times, the limitations of nuclear deterrence are increasingly exposed, and the role of conventional deterrence is being valued again. In particular, the development of high-tech conventional weapons has not only narrowed the gap between combat effectiveness and nuclear weapons, but also has higher accuracy and greater controllability. Conventional deterrence is highly controllable and less risky, and generally does not

lead to devastating disasters like nuclear war. It is convenient to achieve political goals and becomes a credible deterrence method.⁶³

Some of this residual skepticism about the ability of nuclear weapons to generate usable political effects is reflected in the recent growth of the force's conventional systems, which continues to significantly outpace the growth in nuclear systems. According to open sources, China in 2003 deployed approximately 120 conventional launchers, compared to 60 for nuclear ones.⁶⁴ In 2021, China was estimated to deploy 560 conventional launchers and 190 nuclear ones, indicating the rapid relative growth of the service's conventional units. As detailed elsewhere, historically, missile personnel that reach the ranks of senior leadership within the force are more likely to have served in billets associated with conventional than with nuclear mission sets.⁶⁵

Implications: Technical constraints, nuclear communities, operational imperatives

China's nuclear modernization and expansion are easing many of the longstanding constraints on the country's nuclear forces and may create additional drivers for the further expansion and modernization of the force and the adjustment of nuclear strategy.

First, China's recent force developments ease the technical constraints that previously inhibited China from adopting a more expansive nuclear posture. The development and deployment of more accurate missile systems could, especially if paired with lower-yield warhead designs, support strikes against battlefield targets, enabling nuclear warfighting strategies.

Second, the creation of new capabilities might spur the development of new operational concepts. The entangling of conventional and nuclear forces, along with the development of truly dual-capable systems such as the DF-26 might further blur the lines between the conventional and nuclear domains,

⁵⁹ 肖天亮 [Xiao Tianliang], ed., 战略学 [Science of Military Strategy] (Beijing: 国防大学出版社 [National Defence University Press], 2020), p. 387. Quote in English taken from translation of the China Aerospace Studies Institute.

⁶⁰ Christopher P. Twomey, "China's Nuclear Doctrine and Deterrence Concept," in James M. Smith and Paul J. Bolt, Eds., *China's Strategic Arsenal: Worldview, Doctrine, and Systems* (Washington, DC: Georgetown University Press, 2021), pp. 53-57.

⁶¹ Marcus Clay and Roderick Lee, "Unmasking the Devil in the Chinese Details: A Study Note on the Science of Military Strategy 2020," *China Aerospace Studies Institute*, January 24, 2022, pp. 4 and 5.

⁶² 寿晓松 [Shou Xiaosong], 战略学 [The Science of Military Strategy] (Beijing: 军事科学出版社 [Academy of Military Science] 2013), pp. 216-217.

⁶³ 肖天亮 [Xiao Tianliang], ed., 战略学 [Science of Military Strategy] (Beijing: 国防大学出版社 [National Defence University Press], 2020), p. 129. Quote in English taken from translation of the China Aerospace Studies Institute.

⁶⁴ Estimates come from comparing the total SRBM, MRBM, IRBM, and ICBM estimates provided in the China Military Power Reports issued by the US Defense Department to the estimates of nuclear missiles provided in the Nuclear Notebooks prepared by the Federation of American Scientists.

⁶⁵ David C. Logan, "Career Paths in the PLA Rocket Force: What They Tell Us," *Asian Security*, Vol. 15, No. 2, 2019, pp. 103-121; and David C. Logan, "Rocket Force Personnel in the Age of Xi Jinping," in Roy Kamphausen, ed., *The People in the PLA 2.0* (Carlisle, PA: U.S. Army War College Press, 2021), pp. 84-88.

perhaps leading nuclear units to adopt operational concepts previously only applied to conventional units. Although experts believe that most of the deployed dual-use DF-26 missiles are configured for conventional missions, they are capable of quickly being equipped with nuclear warheads.⁶⁶ Brigade commanders have spoken publicly about the need to train their personnel to conduct both nuclear and conventional missions, indicating that the Rocket Force plans on developing the operational capabilities necessary to exploit the system's dual-use features.⁶⁷ If the Rocket Force practices greater rotation of crews between nuclear, conventional, and dual-use systems, some operational concepts previously only applied to conventional systems could be introduced to nuclear and dual-capable ones as well.

Third, the creation and elevation of nuclear units across the PLA creates new constituencies with a vested interest in bolstering the prestige, resources, and autonomy of nuclear forces. Similarly, the creation of a full nuclear triad may spur the development of coordinating mechanisms, which could empower nuclear communities. As the Navy and Air Force develop and consolidate their own nuclear forces, the PLA may require new mechanisms for coordinating both between nuclear forces and Theater Commands and among the various legs of the triad for the purposes of targeting coordination and deconfliction. These mechanisms could give nuclear units a greater platform for influencing higher-level military policy and strategy, especially given the relative lack of nuclear expertise among China's civilian leadership.

Conclusions and implications

The nuclear dimension of the US-China relationship is likely to feature greater attention and competition in the coming years. In the past, commentators highlighted the influence of US policy on China's

nuclear development, including Chinese concerns that US BMD and advanced conventional strike capabilities might neutralize China's nuclear deterrent. These dynamics undoubtedly continue to influence Chinese nuclear decision-making. When discussing China's own nuclear requirements, Chinese nuclear experts most frequently highlight the need to maintain a survivable deterrent in the face of advancing US capabilities.⁶⁸ In addition, US developments in nuclear weapons and, in particular, non-nuclear strategic capabilities provide ready evidence for Chinese nuclear constituencies to push for expanding the country's nuclear forces for more parochial reasons. However, if China's nuclear forces and strategy are increasingly driven by more domestic or ideational factors, it may become more difficult for US policy to influence Chinese nuclear behavior. The United States has limited ability to influence domestic dynamics in China, especially in light of the historic division between the Chinese strategists, who study nuclear weapons issues (and who are more likely to engage with foreign counterparts) and the operators in the Chinese military, who have more sway over policy matters.⁶⁹

Similarly, China's nuclear modernization and expansion may begin to drive US nuclear policy in new directions. Revelations about China's new missile silos, a fractional orbital bombardment system, and hypersonic deployments have intensified US anxieties. In late 2021, Chairman of the Joint Chiefs of Staff Gen. Mark Milley described a Chinese hypersonic missile test as "very close [to a] Sputnik moment."⁷⁰ During a March 2022 hearing before the Senate Armed Services Committee, STRATCOM Commander Adm. Charles Richard stated that "We are facing a crisis deterrence dynamic right now that we have only seen a few times in our nation's history."⁷¹ Concerns that China's advancing capabilities could erode US superiority or threaten US interests abroad has provided additional justification for continuing or expanding the United

⁶⁶ Joshua H. Pollack and Scott LaFoy, "China's DF-26: A Hot-Swappable Missile?" *Arms Control Wonk* (blog), May 17, 2020, <https://www.armscontrolwonk.com/archive/1209405/chinas-df-26-a-hot-swappable-missile/>; and P.W. Singer and Ma Xiu, "China's Ambiguous Missile Strategy Is Risky," *Eastern Arsenal* (blog), *Popular Science*, May 11, 2020, <https://www.popsci.com/story/blog-network/eastern-arsenal/china-nuclear-conventional-missiles/>.

⁶⁷ "China's Military: Both Nuclear and Conventional-Armed Missile Troops [中国军队·核常兼备导弹部队]," *China Daily* [中国日报], July 22, 2017, http://china.chinadaily.com.cn/2017-07/22/content_30212137.htm.

⁶⁸ See, for example, Fiona S. Cunningham, M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2, 2015, pp. 7-50; and Fiona S. Cunningham and M. Taylor Fravel, "China's nuclear arsenal is growing.

What does that mean for U.S.-China relations?" *Monkey Cage* (blog), *The Washington Post*, November 11, 2021, <https://www.washingtonpost.com/politics/2021/11/11/chinas-nuclear-arsenal-is-growing-what-does-that-mean-us-china-relations/>.

⁶⁹ Gregory Kulacki, "Chickens Talking With Ducks: The US-Chinese Nuclear Dialogue," *Arms Control Today*, October 2011.

⁷⁰ David E. Sanger and William J. Broad, "China's Weapon Tests Close to a 'Sputnik Moment,' U.S. General Says," *The New York Times*, October 27, 2021, <https://www.nytimes.com/2021/10/27/us/politics/china-hypersonic-missile.html>.

⁷¹ Bryant Harris, "U.S. Nuclear Commander Warns of Deterrence 'Crisis' Against Russia and China," *Defense News*, May 4, 2022, <https://www.defensenews.com/pentagon/2022/05/04/us-nuclear-commander-warns-of-deterrence-crisis-against-russia-and-china/>.

States' own nuclear investments and avoiding any significant changes in the Biden administration's completed but not yet released nuclear posture review.⁷²

Increased US-China nuclear competition raises the risks of both crisis escalation and arms racing. For instance, analysts have demonstrated how US and Chinese strategists hold systematically different views about the likelihood of nuclear escalation in a crisis or conflict.⁷³ It is also unclear what types of signaling or coercive actions—including, for instance, a demonstration strike on Chinese territory—Chinese officials might interpret as being allowed under the country's no-first-use policy.⁷⁴ Greater mutual suspicion, both in the nuclear domain and generally, may increase the chances of misinterpreting ambiguous signals as preparations for an actual nuclear strike.⁷⁵ Arms racing dynamics are also beginning to materialize as each side may perceive larger and more sophisticated nuclear arsenals as necessary to deter and defend against the other's weapons. In a context of heightened US-China strategic competition, nuclear forces and policy are likely to reflect increased competitive pressures.

Managing the nuclear dimension of the US-China relationship will become increasingly important and difficult due to the general deterioration of the bilateral relationship and the lack of institutionalized communication mechanisms. But there are ways US policy can help reduce the intensity of the competition, the scope of an arms race, and the likelihood of nuclear use.

“Increased US-China nuclear competition raises the risks of both crisis escalation and arms racing.”

First, the United States should continue to call for, and invest in, formal bilateral communication mechanisms with China focused on nuclear risks. These dialogues should be modest in scope given the political challenges. Russia's invasion of Ukraine and the deterioration of the US-Russia arms control partnership make it unlikely to enlist the support of Russian officials in furthering US-China nuclear dialogue. But US experts might recruit Russian non-governmental experts who have participated in past track-2 dialogues to emphasize to Chinese counterparts the value of strategic dialogue. The US government can also support the dialogues by, for instance, providing funding through the Defense Threat Reduction Agency or by reexamining current legal restrictions on US-China military-to-military exchanges.⁷⁶

Second, the United States should be careful not to overreact to China's nuclear modernization and expansion in ways that might either exacerbate nuclear risks or hobble US competitiveness in other domains.⁷⁷ The United States should remain vigilant for signs of greater shifts in Chinese nuclear thinking.⁷⁸ But to the extent that China's nuclear evolution is partly driven by concerns about US strategy, shifts in US nuclear forces and strategy may either promote or discourage further changes in China's nuclear forces and strategy. Recent revelations about China's construction of new missile silos and testing of exotic systems have fueled calls for new competing US systems; some analysts have warned that “threat inflation” could encourage costly overspending or resource misallocation.⁷⁹ Spending on unnecessary nuclear or other strategic capabilities

⁷² “Blinken's Warning on China's Nukes,” *The Wall Street Journal*, August 9, 2021, <https://www.wsj.com/articles/antony-blinken-warning-on-china-nuclear-missiles-11628283652>; and Natasha Bertrand, “China's Latest Missile Test Raises the Stakes for Biden's Nuclear Weapons Review,” *CNN*, November 3, 2021, <https://www.cnn.com/2021/10/22/politics/china-hypersonic-missile-joe-biden-nuclear-policy/index.html>.

⁷³ Fiona S. Cunningham and M. Taylor Fravel, “Dangerous Confidence? Chinese Views on Nuclear Escalation,” *International Security*, Vol. 44, No. 2, 2019, pp. 61-109.

⁷⁴ Christopher P. Twomey, “China's Nuclear Doctrine and Deterrence Concept,” in James M. Smith and Paul J. Bolt, Eds., *China's Strategic Arsenal: Worldview, Doctrine, and Systems* (Washington, DC: Georgetown University Press, 2021), pp. 53-57.

⁷⁵ Gregory Kulacki, “Would China Use Nuclear Weapons First in a War With the United States?” *The Diplomat*, April 27, 2020, <https://thediplomat.com/2020/04/would-china-use-nuclear-weapons-first-in-a-war-with-the-united-states/>; and David C. Logan, “Are They Reading Schelling in Beijing? The Dimensions, Drivers, and Risks of Nuclear-

Conventional Entanglement in China,” *Journal of Strategic Studies*, 2020, pp. 38-40.

⁷⁶ For some discussion, see David C. Logan, Testimony before the US-China Economic and Security Review Commission Hearing on “China's Nuclear Forces,” June 10, 2021, pp. 13-16.

⁷⁷ Natasha Bertrand, “China's Latest Missile Test Raises the Stakes for Biden's Nuclear Weapons Review,” *CNN*, November 3, 2021, <https://www.cnn.com/2021/10/22/politics/china-hypersonic-missile-joe-biden-nuclear-policy/index.html>.

⁷⁸ David C. Logan, “Hard Constraints on a Chinese Nuclear Breakout,” *The Nonproliferation Review*, Vol. 24, No. 1-2, 2017, p. 28; and Nicola Leveringhaus, “Chinese Nuclear Force Modernization and Doctrinal Change,” *IFRI Security Studies Center*, August 19, 2022, p. 11.

⁷⁹ Dan Grazier, “Inflating China Threat to Balloon Pentagon Budget,” *Project on Government Oversight*, June 17, 2021, <https://www.pogo.org/analysis/2021/06/inflating-china-threat-to-balloon-pentagon-budget>; and Michael D. Swaine, *Threat Inflation and the Chinese Military* (Washington, D.C.: Quincy Institute on Responsible Statecraft, 2022), Paper No. 7.

could not only exacerbate arms race dynamics, but also detract from either the development of more important conventional military systems or badly needed domestic investments.

Third, the United States can reduce the likelihood of nuclear escalation in a prospective US-China conflict by working now to reduce the salience of nuclear weapons and nuclear threats generally. Given the dearth of formal communication mechanisms on strategic issues, US officials can signal indirectly in other contexts such as US policy documents. Similarly, the United States should indicate that Russian nuclear signaling over the Ukraine conflict will fail. The United States should continue to condemn Russian nuclear threats, maintain resolve in the face of Russian nuclear saber-rattling, and refrain from issuing its own nuclear threats.⁸⁰ Such signaling would help strengthen the norm against nuclear use and demonstrate US resolve to stand strong against nuclear threats.

⁸⁰ Mary Glantz, "Global Peace Needs a Clear U.S. Reply to Putin's Nuclear Threat," *U.S. Institute for Peace*, May 25, 2022, <https://www.usip.org/publications/2022/05/global-peace-needs-clear-us-reply-putins-nuclear-threat>; and Jeffrey Edmonds, "Potential US responses

to the Russian use of non-strategic nuclear weapons in Ukraine," *Bulletin of Atomic Scientists*, May 16, 2022, <https://thebulletin.org/2022/05/potential-us-responses-to-the-russian-use-of-non-strategic-nuclear-weapons-in-ukraine/>.

2

Baby steps: Laying the groundwork for US-Chinese arms control and risk reduction

Gerald C. Brown

Our military relation with potential enemies is not one of pure conflict and opposition, but involves strong elements of mutual interest in the avoidance of a war that neither side wants, in minimizing the costs and risks of the arms competition, and in curtailing the scope and violence of war in the event it occurs.

Thomas Schelling and Morton Halperin, *Strategy and Arms Control* (1961)

In his 1985 essay for *Foreign Affairs*, “What Went Wrong With Arms Control,” Thomas Schelling highlighted what he saw as a fatal flaw in the US-Soviet approach to arms control from the 1970s onward. “What has been lost in the earlier emphasis on the *character* of weapons, and what has taken its place is emphasis on *numbers*.”¹ This approach continues to haunt us today and is particularly important in the context of future US-China arms control negotiations.

Previous proposals to reduce arsenal sizes make little sense for China in the near term, which maintains an arsenal of approximately 350 nuclear weapons compared to the 3,750 of the United States.² While this number appears to be rising rapidly — Department of Defense estimates put this number at 1,000 weapons by the end of the decade—it remains considerably lower than the United States in the near-term.³ While alarming, there has been no incentive for China to decide to cap its warhead count far behind the United States. But it is not the numbers that are the primary drivers of risk.

Engagement with China on arms control must be considered in the context of the end goal of arms control. While fewer nuclear weapons is a laudable goal, it is an inadequate measure of success. Instead, it is a method for achieving the greater goals of arms control, a means for an end. A more appropriate measure of effectiveness for the situation is the

reduction of risk. In this, arms control is one tool of many to reduce the risk of conflict, or mitigate destruction if conflict occurs. *Instead of focusing on the numbers, arms control must build a mutually beneficial arrangement focused on reducing or mitigating the conditions that would incentivize the use of nuclear arms.*⁴ This paper explores various challenges and risks in the US-China relationship that arms control may help mitigate while helping put together a path towards future arms control and risk reduction arrangements.

Concerns and obstacles

China thus far has had few incentives to join arms control agreements with the United States. This is not to say that China views all forms of arms control with outright hostility.⁵ While China has been skeptical of arms control arrangements historically—and in many important ways still is—since the 1990s it has joined several arms control initiatives such as the Nuclear Nonproliferation Treaty (NPT), Chemical Weapons Convention, and Biological Weapons Convention (BWC).⁶ While not ratified, China played an instrumental role in negotiating the Comprehensive Nuclear Test Ban Treaty and currently abides by it.⁷

Several bilateral agreements between China and Russia are also in place, including agreements to notify each other of missile launches and a mutual no-first-use and de-targeting agreement.⁸ The multilateral Agreement on Mutual Reduction of Military Forces in the Border Area between China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan provides a basis for verification measures via annual compliance inspections between the five countries.⁹

However, substantial obstacles remain. To date, China has not signed any arms control agreements that limit its nuclear arsenal, having refused to impose either qualitative or quantitative restrictions on its arsenal. Instead, China has repeatedly stated

¹ Thomas C. Schelling, “What Went Wrong with Arms Control?,” *Foreign Affairs*, vol. 64, no. 2, Winter 1985, pp. 219–33.

² For an estimate of China’s nuclear force size, Hans M. Kristensen and Matt Korda, “Chinese Nuclear Weapons, 2021,” *Bulletin of the Atomic Scientists*, vol. 77, no. 6, November 2, 2021, pp. 318–36; for US nuclear force size, “Transparency in the US Nuclear Weapons Stockpile” (Washington DC: Department of State, October 5, 2021), <https://www.state.gov/transparency-in-the-u-s-nuclear-weapons-stockpile/>.

³ “Military and Security Developments Involving the People’s Republic of China 2021” (Arlington, VA: Office of the Secretary of Defense, 2021), <https://media.defense.gov/2021/Nov/03/2002885874/-1/-1/0/2021-CMPR-FINAL.PDF>.

⁴ Thomas C. Schelling and Morton H. Halperin, *Strategy and Arms Control* (New York: The Twentieth Century Fund, 1961), p. 3.

⁵ For an overview of China’s approach to arms control, Nancy W. Gallagher, “China on Arms Control, Nonproliferation, and Strategic Stability,” in *China’s Strategic Arsenal: Worldview, Doctrine, and Systems* (Washington DC: Georgetown University Press, 2021), pp. 195–240.

⁶ “Arms Control and Proliferation Profile: China,” Arms Control Association, July 2017, <https://www.armscontrol.org/factsheets/chinaprofile>.

⁷ Gallagher, “China on Arms Control,” pp. 195–240.

⁸ David C. Logan, “Trilateral Arms Control: A Realistic Assessment of Chinese Participation” (Stimson Center, August 9, 2021), <https://www.stimson.org/2021/trilateral-arms-control-a-realistic-assessment-of-chinese-participation/>.

⁹ Tong Zhao, “China’s Approach to Arms Control Verification,” Sandia Report (Sandia National Laboratories, March 2022), p. 16.

that it would join the nuclear arms reduction process contingent on deep cuts from the United States and Russia. However, the conditions to meet this threshold for Chinese reductions keep shifting. In 1982, China stated they would join talks if the United States and the Soviet Union reduced arsenals by 50 percent. In 1988, as the Strategic Arms Reduction Treaty (START I) was established, they modified their position to refuse to join until after further drastic reductions were enacted, and redefined their position again in 1995 for START II, requiring further reductions and the abolishment of all tactical nuclear weapons and ballistic missile defense platforms amongst other requirements.¹⁰ Instead, while US and Russian arsenals have declined drastically over the last several decades, China's arsenal continues to grow exponentially in disregard to its obligations under the NPT.

Moreover, China appears to view US attempts at arms control as a hostile means of curbing and constraining its rise—giving it little incentive to participate. Concerns about verification of formal arms control creates considerable hesitation. Rather than adopting the view that verification would help build trust between the United States and China, Beijing appears to view the issue in the opposite light, seeing trust as a necessary prerequisite to any form of verification activity.¹¹ Chinese experts often highlight that arms control may asymmetrically benefit the stronger party, expressing concerns that the United States could engage in espionage or cheat on arms control agreements and avoid detection due to technological advantages.¹²

The United States, for its part, has tried to establish official dialogues on arms control with China several times. Both the George W. Bush and Barrack Obama administrations sought to open dialogues with Beijing on nuclear forces and missile defense issues, but neither initiative succeeded.¹³ The Trump administration attempted to bring China into the New START process alongside the United States and Russia, whereas the Biden administration has signaled that it would pursue bilateral discussions

with China on arms control.¹⁴ However, these attempts have yielded little success, with Beijing instead viewing these attempts with suspicion. As tensions rise between the United States and China, arms control becomes an increasingly daunting task.

Chickens talking to ducks

While moving toward arms control is difficult, there are concerning risks in the US-China relationship in which both sides would stand to benefit from curbing. Part of the challenge originates from unique conceptions on the role nuclear weapons and deterrence play, and different worldviews regarding international relations between the two states. In other words, both states view the world through different lenses, views that are often poorly understood by the other. Similarly, actors on both sides share a human proclivity to assume the other understands their signals and intentions—even when drastically mistaken. As Chinese military power increases and China becomes a more prominent actor in global affairs, misperceptions of the intentions of the other carry substantial risks for conflict and escalation.

This misperception has repeatedly been an issue throughout history. For example, routine US nuclear exercises during Able Archer nearly sparked conflict as the Soviet Union misinterpreted it as preparations for a nuclear strike, unbeknownst to the United States.¹⁵ Nixon's nuclear alert in 1969 intended to use nuclear signals to convince adversaries that he would do anything to end the Vietnam War, signals that were misunderstood and ignored.¹⁶ Alternatively, talks between Secretary McNamara and Premier Kosygin at Glassboro revealed completely contrary views on ballistic missile defense concerns.¹⁷ Continued dialogues between the two countries served to bring a common understanding of the risks and concerns surrounding missile defense, which largely continues today.

While the United States and China often misunderstand each other, Washington has placed a

¹⁰ Brad Roberts, "The Case for US Nuclear Weapons in the 21st Century," (Stanford, CA: Stanford University Press, 2016), pp. 151-152.

¹¹ Zhao, "China's Approach to Arms Control Verification," p. 16.

¹² Zhao, "China's Approach to Arms Control Verification," p. 9.

¹³ Elbridge A. Colby and Abraham M. Denmark, "Nuclear Weapons and U.S.-China Relations: A Way Forward" (Washington DC: Center for Strategic and International Studies, March 12, 2013), p. 13.

¹⁴ Logan, "Trilateral Arms Control."

¹⁵ "The Soviet War Scare" (Presidents Foreign Intelligence Advisory Board, February 15, 1990), [https://nsarchive2.gwu.edu/nukevault/ebb533-The-](https://nsarchive2.gwu.edu/nukevault/ebb533-The-Able-Archer-War-Scare-Declassified-PFIAB-Report-Released/2012-0238-MR.pdf)

[Able-Archer-War-Scare-Declassified-PFIAB-Report-Released/2012-0238-MR.pdf](https://nsarchive2.gwu.edu/nukevault/ebb533-The-Able-Archer-War-Scare-Declassified-PFIAB-Report-Released/2012-0238-MR.pdf)

¹⁶ Scott D. Sagan and Jeremi Suri, "The Madman Nuclear Alert: Secrecy, Signaling, and Safety in October 1969," *International Security*, vol. 27, no. 4, 2003, pp. 150-183.

¹⁷ Edward J. Drea, *McNamara, Clifford, and the Burdens of Vietnam 1965-1969* (Washington, DC: Historical Office, Office of the Secretary of Defense, 2011), pp. 364-370.

greater emphasis on resolving these differences. Drawing on its deep experience with nuclear crises during the Cold War, the United States has repeatedly sought official Track-1 talks with China to help both sides understand how the other thinks about these issues and how they may respond, with the goal being to improve predictability and more effectively manage potential crises. However, to date China has refused to engage in such talks.

Concerning differences in both the United States and China's understanding of concepts have materialized during unofficial Track-1.5 talks. For example, some Chinese participants believed that Chinese attacks against US satellites during a crisis might be a stabilizing act that forces the United States to deescalate due to its reliance on space. To the shock of the Chinese, US participants proclaimed the exact opposite would be true and that such actions may even warrant a nuclear response.¹⁸ Failure by both sides to understand the other could carry several escalation risks yet to be understood.

Chinese planners may also overestimate how much faith the United States puts in positions they believe are well communicated. For instance, Chinese declarations that they would not use nuclear weapons first in a conflict carry little weight in US circles. US planners often think in worst-case terms, assuming that the People's Liberation Army (PLA) may opt to use nuclear weapons first in a conflict to secure victory, particularly with a lack of verifiable safeguards to ensure the authenticity of a no-first-use posture. In the case of China, mirror imaging is especially prevalent and exacerbated by the lack of available information from the Chinese side on their nuclear forces and doctrine, leaving holes filled with worst-case speculation. Some Chinese planners may assume their intentions and signals are understood and that the United States has more faith in their no-first-use stance than is warranted. This misperception could result in escalation, as Chinese actions and signaling push first use concerns in the US that Chinese planners may not intend.

Nuclear strategy and expansion

Consider further China's approach to nuclear strategy, which varies significantly from that of the United States.¹⁹ Traditionally, Chinese assessments put little value on nuclear weapons as a warfighting tool.²⁰ Instead, nuclear weapons have been geared towards checking an adversary's capacity to use nuclear coercion. By maintaining a robust and survivable arsenal, Beijing believes nuclear weapons can serve as a check on an adversary's nuclear weapons, and at a lower cost than the expansive arsenals of the United States or Russia. Simultaneously, by checking an adversary's nuclear arsenal, the PLA's investments in conventional forces and focus on controlling the information domain can be exploited in a conventional conflict, fighting "conventional conflicts under conditions of nuclear deterrence."²¹

This is substantially different from the view of the United States, which has historically relied on nuclear weapons to offset conventional inferiority in specific theaters. US plans have also involved counterforce attacks against an adversary's nuclear capabilities, diminishing their capacity to retaliate against the United States. Further, the United States places greater emphasis on risks of unintentional escalation, stemming largely from its experiences managing crises with the Soviet Union during the Cold War. Instead, Chinese planners appear to display concerning overconfidence in their ability to control escalation.²²

These differences become especially concerning as China undertakes a massive expansion of its nuclear capabilities. Satellite imagery has pointed to approximately 300 new missile silos in China, a breathtaking expansion.²³ China is also fielding a nuclear triad, increasing its numbers of nuclear-armed submarines and building the H-20 stealth bomber coupled with a nuclear-capable air-launched ballistic missile (ALBM).²⁴ Deployments of theater-

¹⁸ David Santoro and Robert Gromoll, "On the Value of Nuclear Dialogue with China: A Review and Assessment of the Track 1.5 'China-US Strategic Nuclear Dynamics Dialogue,'" *Issues & Insights*, vol. 20, no. 1, November 2020), p. 19, https://pacforum.org/wp-content/uploads/2020/11/issuesinsights_Vol20No1.pdf.

¹⁹ For a more detailed look at Chinese approaches to nuclear strategy, see David Logan's essay in this volume.

²⁰ Xiao Tianliang [肖天亮], ed., *Science of Military Strategy* [战略学] (Beijing, CN: National Defense University Press [国防大学出版社], 2020), pp. 128-129.

²¹ Yu Jixun [于际训], ed., *Science of Second Artillery Campaigns* [第二炮兵战役学] (Beijing, CN: PLA Press [解放军出版社], 2004), p. 275.

²² Taylor M. Fravel and Fiona Cunningham, "Dangerous Confidence: Chinese Views on Nuclear Escalation," *International Security*, vol. 44, no. 2, Fall 2019, pp. 61-109.

²³ Matt Korda and Hans Kristensen, "A Closer Look at China's Missile Silo Construction," Federation Of American Scientists, November 2, 2021, <https://fas.org/blogs/security/2021/11/a-closer-look-at-chinas-missile-silo-construction/>.

²⁴ Hans M. Kristensen, "China's Strategic Systems and Programs," in *China's Strategic Arsenal: Worldview, Doctrine, and Systems*, ed. James M. Smith and Paul J. Bolt (Washington: Georgetown University Press, 2021), 108-112.

range, nuclear missiles such as the DF-26 continue to grow, threatening US bases in the region. The lack of discourse from the Chinese side on the intentions of such expansions or even an acknowledgment that this expansion exists allows wild speculation and worst-case thinking in US circles on the intent of the expansion, creating substantial risks of misperception.

US experts have concerns that as China's nuclear arsenal expands and it feels more secure in its retaliatory capability, this may embolden Chinese conventional operations such as attacks against Taiwan, which would quickly draw the United States into a conflict with China.²⁵ Such a conflict would cause devastating costs and loss of life on its own, but there would also be substantial risks of nuclear escalation. Increasingly, nuclear and conventional forces are reliant on the same systems. For example, both US conventional and nuclear forces use several of the same command, control, and communications (C3) pathways.²⁶ In a conflict, attacks against these systems would cripple conventional C3 and intelligence, surveillance, and reconnaissance (ISR), but also nuclear C3 (NC3) and related ISR components. Moreover, these actions would resemble preparation for a nuclear attack, and the United States would be unable to determine if this was the case. That, coupled with a degraded ability to see events unfolding on the ground, heightened tensions, the fog of war, and potential Chinese nuclear signaling to show resolve, creates a concerning nuclear first-strike incentive.²⁷

There is less available on Chinese NC3, but the same issues appear to be present. Chinese nuclear and conventional submarines rely on the same C3 centers that would be targeted in a conflict, and dual-use systems such as the DF-21 and DF-26 raise concerns regarding incentives for nuclear use.²⁸ Attacks intended to defeat an adversary's conventional capabilities would likely degrade nuclear forces as

well. Increasingly entangled Chinese systems coupled with little clarification on the extent of this entanglement create immense escalation risks during conflict.

This increased risk, coupled with the current lack of transparency surrounding emerging nuclear deployments, makes the current expansions of Chinese nuclear forces a substantial escalation risk.

In a sense, deployments of Chinese missile silos, if employed with an appropriate level of transparency regarding what these systems look like and their intended purpose, could be argued to foster greater stability on the nuclear side by reducing first strike incentives and ensuring a more survivable Chinese retaliatory force. However, this is unlikely to be the case. These same conditions seem likely to embolden China in conventional operations that carry a substantial risk of nuclear escalation.²⁹ This increased risk, coupled with the current lack of transparency surrounding emerging nuclear deployments, makes the current expansions of Chinese nuclear forces a substantial escalation risk.

The failure on the Chinese side to acknowledge these escalation risks, their overconfidence in controlling escalation, and a lack of transparency surrounding capabilities and posture make the emerging environment one of great concern. These risks are particularly concerning in light of differing views of regional claims in the south and east China sea and Taiwan. Both the United States and China view themselves as defending the status quo from an aggressive outside force.³⁰ China's explicit willingness to use force against Taiwan carries

²⁵ See: Abraham M. Denmark and Caitlin Talmadge, "Why China Wants More and Better Nukes," *Foreign Affairs*, November 19, 2021, <https://www.foreignaffairs.com/articles/china/2021-11-19/why-china-wants-more-and-better-nukes>; and Gerald C Brown, "Understanding the Risks and Realities of China's Nuclear Forces," *Arms Control Today* 51, no. 5 (June 2021), pp. 6–13, <https://www.armscontrol.org/act/2021-06/features/understanding-risks-realities-chinas-nuclear-forces>.

²⁶ James M. Acton, "Escalation through Entanglement: How the Vulnerability of Command-and-Control Systems Raises the Risks of an Inadvertent Nuclear War," *International Security*, vol. 43, no. 1, August 2018, pp. 56–99.

²⁷ Gerald C Brown, "Blurring the Line: Conventional Systems and Nuclear Risks in the U.S.-China Relationship," *On the Horizon* (Center for Strategic and International Studies, May 2022), pp. 42–53, <https://www.csis.org/analysis/horizon-vol-4-collection-papers-next-generation-nuclear-professionals>.

²⁸ Caitlin Talmadge, "Would China Go Nuclear? Assessing the Risk of Chinese Nuclear Escalation in a Conventional War with the United States," *International Security*, vol. 41, no. 4, April 2017, pp. 50–92.

²⁹ Denmark and Talmadge, "Why China Wants More and Better Nukes."

³⁰ 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, 2012, pp. 463–466.

substantial risks.³¹ Arms control should seek to mitigate these risks and help curb chances of escalation.

Laying the groundwork

Arms control, properly considered, does not look solely at numbers and capabilities but at the broader context to determine items that threaten stability and create unnecessary risks and arms racing. Arms control cannot eliminate the causes of tensions and divisions driving competition between the United States and China. However, it can help both states manage this competition: reducing risk, managing unintended escalation, and curbing the scale and destruction of war should it occur.

Several components should be understood when pursuing these arrangements. First, the US-China relationship is substantially different from that of the United States and Russia. Pulling China into existing bilateral arrangements between the United States and Russia is not likely to be a realistic proposal. While multilateral arrangements may serve important roles and appear to be the preferred method from the Chinese side, such arrangements would likely need to be broader and include France and the United Kingdom, the two additional permanent members of the United Nations Security Council.³² Successful arms control initiatives may necessitate a mixture of new and creative bilateral and multilateral initiatives.

Furthermore, arms control is not a one-way street. For arms control to be successful, both countries must make a genuine effort to work towards mutually beneficial risk reduction, with a focus on the mutual. Part of the challenge is Chinese strategists do not appear to view arms control as a genuine attempt to improve stability, viewing it instead as a measure to

lock in US superiority.³³ US-Chinese arms control arrangements should focus primarily on qualitative components, behaviors, and norms to reduce first-strike incentives, promote common understandings of intentions and risk, improve predictability, and curb unintentional escalation pathways. Arms control should reinforce deterrence rather than limit either state's security.³⁴

To be effective, arms control should reflect the rapidly changing and integrated state of modern weapons and technology, including the growing intersection between space, cyber, and nuclear arms.³⁵ Importantly, it must also include missile defense. Chinese strategists have long held missile defense as a key concern, despite US dismissals of its effectiveness towards Chinese weapons.³⁶ Authoritative Chinese writings on strategy highlight that "(w)hile major nuclear powers are reducing their nuclear forces, they are paying more and more attention to building missile defense systems" to "maintain its absolute nuclear superiority."³⁷ These issues are intrinsically inter-related, and efforts towards arms control are unlikely to progress without a willingness to examine nuclear weapons and missile defense together.

Working towards mutually beneficial arms control has been a substantial challenge to date, with the Chinese side often being unwilling to reciprocate transparency towards nuclear weapons. Chinese experts cite that they are a weaker military force and that such reciprocation would negatively impact Chinese national security.³⁸ However, the PLA is no longer a budding military power; China retains the second highest gross domestic product globally,

³¹ See: Xi Jinping, "Remarks by Xi Jinping at the 40th Anniversary Commemoration of 'Message to Compatriots in Taiwan'" (Xinhua, January 2, 2019), http://www.xinhuanet.com/english/2019-01/02/c_137715300.htm; Xi Jinping, "Xi Jinping's Report at 19th CPC National Congress," October 18, 2017, <https://www.mfa.gov.cn/ce/ceil/eng/zt/19thCPCNationalCongress/t1512045.htm>; and "Anti-Secession Law" (Embassy of the People's Republic of China in the United States of America, March 15, 2005), <https://www.mfa.gov.cn/ce/ceus/eng/zt/999999999/t187406.htm>.

³² Zhao, "China's Approach to Arms Control Verification," 20; For more information on multilateral arrangements using the P-5 mechanism, see Heather Williams' essay in this volume.

³³ Henrik Stalhane Hiim and Magnus Langset Troan, "China's Atomic Pessimism and the Future of Arms Control," *War on the Rocks*, June 21, 2021, <https://warontherocks.com/2021/06/chinas-atomic-pessimism-and-the-future-of-arms-control/>.

³⁴ Deterrence takes different meanings between Chinese and American scholars, with the Chinese concept (威慑) containing concepts of both

compellence and deterrence, looking more similar to American concepts of coercion. The proposition of "strengthening deterrence" should be under in the American terms in that it seeks to promote stable relations and prevent incentives to use nuclear weapons or military force. This difference in understanding is one of many key differences between the US and Chinese sides' understanding of nuclear arms and strategy, causing both sides to misunderstand the other and their intentions. Dialogue is crucial in building a shared understanding of issues and curbing misunderstandings.

³⁵ Rebecca K.C. Hersman, Heather Williams, and Suzanne Claeys, "Integrated Arms Control in an Era of Strategic Competition" (Washington DC: Center for Strategic and International Studies, January 21, 2022), <https://www.csis.org/analysis/integrated-arms-control-era-strategic-competition>.

³⁶ Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, vol. 40, no. 2, October 2015, pp. 7–50.

³⁷ Xiao, *Science of Military Strategy*, p. 384.

³⁸ Zhao, "China's Approach to Arms Control Verification," pp. 19–20.

closely trailing the United States.³⁹ Its military spending is the second highest globally, and it maintains the world's largest Navy.⁴⁰ With this increased power and increasingly global ambition come significant risks that both the United States and China must seek to avoid. Avoiding this comes with talking and jointly working towards risk reduction. Both states should come to an understanding on avenues that would be mutually beneficial and work towards a joint consensus. Engaging in broader terms as described above, to include several strategic capabilities instead of nuclear-only talks, may help encourage eventual transparency.

Finally, there is a long way to go in building arms control arrangements between the United States and China. Progress in this domain will not be quick; it will be a slow, complicated, and challenging process as both sides work to build trust and secure their own interests. Recall that arms control between the United States and the Soviet Union in the form of restricting nuclear arsenals did not occur quickly—it took decades of competition, talks, and a nearly catastrophic nuclear crisis for the Strategic Arms Limitations Talks to come about. However, one of the great triumphs of arms control is that the process yields immense benefits, as dialogue between states helps mitigate many of these issues and foster common understanding. Perhaps the most essential step is talking and determining these areas where cooperation can serve both states' interests. The simple act of talking to each other serves to help allow both states to understand the other's point of view and learn to understand how the other may react in a crisis to avoid misperception and unintended escalation. However, China's concerns about transparency and skepticism towards US intentions have thus far made this seemingly simple step an insuperable challenge, raising further doubt in US circles regarding Chinese intentions.

Confidence building and risk reduction

Talks between US and Chinese officials to mitigate misperceptions, help both sides understand each other, and determine escalation risks has immense value. Some official military-to-military exchanges occur between Washington and Beijing; however, these do not discuss nuclear issues.⁴¹ The closest thing has instead been series of Track-1.5 talks between US and Chinese researchers and government officials operating in an unofficial capacity.⁴² These talks aimed to build a shared understanding of the concerns and objectives of both states, allowing US and Chinese officials to understand the actions of the other better. The talks covered various topics, ranging from regional actors, escalation, arms control, missile defense, and several others. They built valuable relationships between the US and Chinese sides, helped determine the range of evolving views held by the other participants, helped participants understand the other's priorities and red lines, and allowed for valuable insight into each other's strategies and operations.

These insights are valuable for both sides, allowing scholars and practitioners alike to gain valuable insights into the minds of the other and craft more effective research and policy. Without mutual dialogue, both sides risk misinterpreting the actions of the other and causing unintended escalation. It is almost ironic then that the Track-1.5 talks were defunded due to failing to produce Track-1 talks. Reigniting these and other talks on nuclear issues, even at a Track-1.5 level, should be an essential starting point for moving towards arms control and risk reduction. However, it should be stated that while valuable, Track-1.5 talks cannot substitute for the essential role of official Track-1 talks. While Track-1.5 talks are a useful step, the "real" work ultimately gets done between decision makers in both countries. The failure of these unofficial discussions to produce official Track-1 talks points to a real problem. However, while the United States should continue to push for Track-1 talks that could undoubtedly lead to more valuable results, the

³⁹ "GDP (Current US\$)," The World Bank, accessed June 1, 2022, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?most_recent_value_desc=true.

⁴⁰ For comparisons of military spending, see: Diego Lopes Da Silva et al., "Trends in World Military Expenditure, 2021," April 2022, https://www.sipri.org/sites/default/files/2022-04/fs_2204_milex_2021_0.pdf; for a comparison of the size of the US and Chinese Navy, see: "China Naval Modernization: Implications for US Navy Capabilities—Background and Issues for Congress" (Congressional Research Service, March 8, 2022), <https://sgp.fas.org/crs/row/RL33153.pdf>.

⁴¹ Caitlin Campbell, "China Primer: U.S.-China military-to-military Relations" (Washington DC: Congressional Research Service, January 4,

2021),

[https://crsreports.congress.gov/product/pdf/IF/IF11712/3#:~:text=Dialogues%20and%20exchanges%3A%20U.S.%2DChina,Maritime%20Consultative%20Agreement%20talks%20\(est](https://crsreports.congress.gov/product/pdf/IF/IF11712/3#:~:text=Dialogues%20and%20exchanges%3A%20U.S.%2DChina,Maritime%20Consultative%20Agreement%20talks%20(est)

⁴² For detailed reports on these talks, David Santoro and Robert Gromoll, "On the Value of Nuclear Dialogue with China: A Review and Assessment of the Track 1.5 'China-US Strategic Nuclear Dynamics Dialogue'" and Brad Roberts, ed., *Taking Stock: U.S.-China Track 1.5 Nuclear Dialogue* (Lawrence Livermore National Laboratory: Center for Global Security Research, 2020), https://cgsr.llnl.gov/content/assets/docs/CGSR_US-China-Paper.pdf.

benefits of talks even at the Track-1.5 level cannot be understated.

Talks are not the only measure that help work towards formal arms control. Crisis management mechanisms were essential steps in the US-Soviet relationship building towards arms control, such as the 1963 hotline agreement following the Cuban Missile Crisis. While there are important differences between the contemporary relationship between the United States and China, crisis management mechanisms could serve as important steps towards risk reduction and ultimately, more formal arms control. Crisis management mechanisms such as hotlines between appropriate military and political departments to allow both sides to clarify intentions and discuss incidents in real time, potentially improving communications in the middle of a crisis.

However, the efficacy of these types of programs to date is questionable. Reports have highlighted that hotlines rung in empty rooms for hours when the United States tried to reach China,⁴³ or have purposely been ignored.⁴⁴ Further, there is concern that poorly designed mechanisms of this sort could increase risk by providing incentives for risk-taking.⁴⁵ While improved crisis communication would be valuable, US and Chinese officials must come to a common consensus on the matter, and focus more on maintaining and executing them properly.⁴⁶ Without mutual reciprocation and desires to maintain them, such measures would do little to improve the situation.

A wide array of additional confidence-building mechanisms may also prove worthwhile. Scholars have proposed various measures that may prove beneficial, such as reciprocal visits to missile defense sites and Chinese participation in mock START inspections.⁴⁷ Further, these types of measures should not be limited to the nuclear domain; both sides should explore rules of the road on a wide range of intersecting issues such as cyber, space, hypersonic

technology, and more. These issues are increasingly integrated in modern warfare and engaging in a broader sense may help both sides bring about points of concern that impact the ultimate concern, mutual risk reduction. These measures would help foster stability and trust between both sides on sensitive issues of concern. Improving reciprocal trust between both sides would be essential to lay the groundwork for future arms control talks.

Exploring future arms control arrangements

Formal arms control arrangements would be a long-term proposal, unlikely to materialize in the near future. Nonetheless, further talks can help lay the groundwork for arms control by identifying areas of potential misperception and avenues of win-win cooperation. Without trying to curb both sides' arsenal sizes, a wide variety of potential measures could dictate norms of behavior that could help identify and curb first-strike incentives and misperceptions. While many of these would be determined or expanded on throughout talks and with a better understanding of both sides' thoughts on the subject, several potential avenues of cooperation may benefit from arms control.

One point that could serve to help further stability and reduce first-strike incentives is discussing mutual vulnerability. Chinese planners have long pushed for this, fearing that the United States seeks a position of absolute security vis-à-vis China, in which it could degrade China's nuclear forces during a first strike to a point where US missile defense would intercept any surviving Chinese nuclear forces that retaliated.⁴⁸ Mutual vulnerability is a technical reality regardless of political statements. However, a willingness to at least engage on this subject and work towards a common consensus on what mutual vulnerability looks like could be a valuable means of reducing incentives for Chinese nuclear expansion and lowering first-strike risks.⁴⁹

⁴³ Logan, "Trilateral Arms Control."

⁴⁴ Jacob Stokes and Zack Cooper, "Thinking Strategically About Sino-American Crisis Management Mechanisms," *War on the Rocks*, September 30, 2020, <https://warontherocks.com/2020/09/thinking-strategically-about-sino-american-crisis-management-mechanisms/>.

⁴⁵ Logan, "Trilateral Arms Control."

⁴⁶ David Logan, "Overconfidence in Confidence Building: Why Sloppy Implementation Makes Us Less Secure," *Foreign Affairs*, October 6, 2016, <https://www.foreignaffairs.com/articles/china/2016-10-06/overconfidence-confidence-building>.

⁴⁷ Colby and Denmark, "Nuclear Weapons and U.S.-China Relations," pp. 24-25.

⁴⁸ Cunningham and Fravel, "Assuring Assured Retaliation," pp. 7-50.

⁴⁹ Brad Roberts, "Rethinking Mutual Vulnerability in an Era of US-China Strategic Competition," in *US-China Mutual Vulnerability: Perspectives on the Debate*, vol. 22, Issues and Insights SR2 (Pacific Forum, 2022), pp. 16-25, <https://pacforum.org/wp-content/uploads/2022/05/Issues-Insights-Vol.-22-SR-2.pdf>; for a contending view, see Matthew Costlow's essay in the same volume: Matt Costlow, "Questioning the Assumptions of Declaring Mutual Vulnerability with China," in *US-China Mutual Vulnerability: Perspectives on the Debate*, vol. 22, Issues and Insights SR2 (Pacific Forum, 2022), pp. 26-34, <https://pacforum.org/wp-content/uploads/2022/05/Issues-Insights-Vol.-22-SR-2.pdf>.

Talks would have to encompass a wide array of concerns on both sides, including US ballistic missile defense and conventional strike capabilities, as well as China's increasingly sophisticated and rapidly expanding nuclear arsenal. Both sides should approach the talks with an understanding that the other has valid concerns in this domain. For example, US ballistic missile defense is a critical component to protect itself from actors such as North Korea and Iran, and Chinese concerns around nuclear survivability and deterring attack are a rational concern. However, the United States should not move in this domain unilaterally. Short of negotiated, reciprocated restraint, the United States cannot put itself at a disadvantage unilaterally.

Perhaps one of the most critical issues is the growing intersection between nuclear and non-nuclear systems. Both sides may find it beneficial to determine mutual means to decouple some aspects of these systems and mitigate nuclear risks stemming from entanglement. This could take several different forms. For example, decoupling select aspects of each other's NC3 to maintain adequate command and control of nuclear systems during a conventional conflict may be prudent. Further, it may serve both nations' interests to identify better the difference between conventional and nuclear variants of weapons and ensure nuclear forces are not targeted by mistake during conflict.⁵⁰

Other aspects of concern could include incentives presented by land-based multiple independent reentry vehicles (MIRVs). While China may be unwilling to put these on the table, there should at least be a discussion about the concerns MIRVs may generate. MIRVs carry incentives to use missiles first, as a smaller number of an adversary's weapons could be used to cripple a greater number of nuclear weapons concentrated in a small area. The United States no longer deploys multiple warheads on its land-based missile force. However, recent PLA missile developments indicate that new intercontinental ballistic missiles such as the DF-41 may possess multiple warheads, undermining Chinese no first use assurances and creating a concerning incentive for nuclear first strike.

Scholars have proposed additional measures, such as a bilateral fissile material cutoff treaty.⁵¹ Such a treaty would have both states declare a cutoff in fissile material production, coupled with transparency measures to validate these claims. This would alleviate many Chinese national security concerns surrounding arms control verification while building confidence on both sides regarding fissile material production and current stockpiles.

A final point of consideration: while it is seemingly easier to identify points of mutual benefit in a bilateral context, the contemporary nuclear environment features many important nuclear actors, making it much harder to execute. Measures taken bilaterally with one state may weaken a state in relation to another. For example, Russian and US dissolution of the Intermediate-Range Nuclear Forces Treaty was largely inspired by China's increasing arsenal of weapons within that range.⁵² Simultaneously, multilateral arms control agreements are less likely to contain meaningful content, as multiple nations face conflicting capabilities, arsenal sizes, interests, and security concerns. Regardless, even small steps are important ones. Engagement in bilateral and multilateral contexts both may play important roles in different ways, but the greater multilateral context must be considered as both the United States and China seek to craft effective agreements to improve stability and predictability in an increasingly tenuous relationship.

Conclusions

Formal US-China arms control prospects remain far off, and any movement towards it will be slow and arduous. Nevertheless, the benefits are worth the challenges. Arms control will not forestall rising tensions and competition between the United States and China, but it may help manage the risks. When considering something as dangerous and catastrophic as nuclear war, both states should take every precaution to manage risk.

The United States and China are at the beginning of what is likely to be a long and challenging phase of international affairs. This may prove to be the most

⁵⁰ Tong Zhao, "Practical Ways to Promote U.S.-China Arms Control Cooperation" (Carnegie Endowment for International Peace, October 7, 2020), <https://carnegieendowment.org/2020/10/07/practical-ways-to-promote-u.s.-china-arms-control-cooperation-pub-82818>.

⁵¹ James M. Acton, Thomas D. MacDonald, and Pranay Vaddi, "Reimagining Nuclear Arms Control: A Comprehensive Approach" (Carnegie

Endowment for International Peace, October 21, 2021), pp. 47-52, [https://carnegieendowment.org/files/Acton et al Reimagining Arms Control fnl 1.pdf](https://carnegieendowment.org/files/Acton%20et%20al%20Reimagining%20Arms%20Control%20Final.pdf).

⁵² David E. Sanger and Edward Wong, "U.S. Ends Cold War Missile Treaty, With Aim of Countering China," *The New York Times*, August 1, 2019, <https://www.nytimes.com/2019/08/01/world/asia/inf-missile-treaty.html>.

dangerous phase of the competition. Neither state properly understands the others, dialogue and arms control are not well established, and risks stemming from this misperception are concerning. However, this relationship is not solely adversarial, and arms control and risk reduction may prove to be the most fruitful means of cooperation in managing risk.

Secretary of State Antony Blinken recently stated that “(w)hen we can engage constructively with China, we will—not as a favor to us or anyone else, and never in exchange for walking away from our principles, but because working together to solve great challenges is what the world expects from great powers, and because it’s directly in our interests to do so.”⁵³ Working towards joint arms control is the embodiment of this directive. Tensions are high, and competition will not dissipate anytime soon. Nevertheless, working together to solve the existential risks facing both nations is the responsibility of great powers and in the interests of both states.

⁵³ Antony J. Blinken, “Our Approach to the People’s Republic of China,” US Department of State, May 31, 2022, <https://content.govdelivery.com/accounts/USSTATEBPA/bulletins/319bf58>.

3

Five scenarios for the P5 process: Opportunities for Beijing and Washington

Heather Williams

In early 2022, China, France, Russia, the United Kingdom, and United States (the “P5”) jointly stated that “a nuclear war cannot be won and must never be fought.”¹ Only two months later, Russia invaded Ukraine and on February 27, 2022, Russian President Vladimir Putin announced a change in the military and nuclear status to a “special service regime.”² At the time, this announcement was interpreted as potentially lowering the threshold for nuclear weapons use and undermining the principles of the earlier P5 statement.³ As an additional challenge, the 2022 Review Conference (RevCon) of the Nuclear Non-Proliferation Treaty (NPT) ended without a consensus Final Document because of Russian objections to a variety of clauses, particularly about control of the Zaporizhzhya Nuclear Power Plant. Yet despite these challenges, the P5 are still expected to meet every year as part of their commitments under the NPT. Events in Ukraine throw the future of the P5 process and its potential contributions towards disarmament into question.

Established in 2009, the P5 process, also sometimes referred to as the “N5 process” to indicate the five recognized nuclear-armed states under the NPT, was initially intended to bring these states together to demonstrate their commitment to their NPT obligations, facilitate confidence-building, and gradually make progress on disarmament.⁴ The process is unique in multiple ways, but it is particularly important as one of the only forums for nuclear dialogue with China. In recent years, China has come to play an important leadership role in the P5 process, notably by leading development of a glossary of shared terms to facilitate dialogue on nuclear issues. But Russia’s actions in Ukraine create an especially difficult situation for China. While Beijing has held off on joining Western condemnation of Putin’s actions, it may have to take a stronger stance against Russia if it wants to be a leader within the P5 process and the NPT more broadly. The future of the P5 process, therefore, depends not only on the denouement of the Ukraine crisis, but also on how

China and other P5 members respond to Russia’s aggression and blockages in the NPT.

This paper proceeds in three parts. First, it provides a brief background of the P5 process, with an emphasis on China’s increasingly active role in nuclear politics in recent years and nuclear wolf warrior diplomacy. Second, it looks at five possible scenarios for the future of the P5 process: *collapse, pause and pivot, minimize, continue, and expand*. The paper concludes by outlining specific decisions for Beijing and Washington and offering recommendations for how to leverage the P5 process as an opportunity for strategic risk reduction at a time when the world desperately needs it, while remaining sensitive to the worsening geopolitical landscape. The paper argues that the P5 process still has potential to contribute to the NPT, but that it should focus its agenda on crisis stability and risk reduction.

All of this requires a word of caution, however, as the P5 process will be dependent on wider geopolitics. Neither the NPT nor the P5 process happen in a vacuum but assuming all states see an enduring value to the process, there are options for the way ahead. As Ambassador Gustavo Zlauvinen, the President of the NPT RevCon, noted following the Conference’s conclusion, “the current international context had a negative impact on the negotiation and, even more so, on the result of the Conference.”⁵ This holds true not only for the NPT, but also for the P5.

Opportunities and pitfalls of the P5 process

Established in 2009, the P5 process was intended to foster dialogue and progress towards disarmament among the five members. Since its inception, the P5’s agenda has grown to include issues such as pursuit of a Fissile Material Cut-Off Treaty and, more recently, transparency of nuclear doctrines and strategic risk reduction.⁶ The most recent P5 meeting

¹ The White House, “Joint Statement of the Leaders of the Five Nuclear-Weapon States on Preventing Nuclear War and Avoiding Arms Races,” Press release, January 3, 2022, <https://www.whitehouse.gov/briefing-room/statements-releases/2022/01/03/p5-statement-on-preventing-nuclear-war-and-avoiding-arms-races/#:~:text=We%20affirm%20that%20a%20nuclear,deter%20aggression%2C%20and%20prevent%20war.>

² Heather Williams, “Putin is a Nuclear Bully,” Royal United Services Institute, March 1, 2022, <https://rusi.org/explore-our-research/publications/commentary/putin-nuclear-bully>

³ Liviu Horowitz and Lydia Wachs, “Russia’s Nuclear Threats in the War against Ukraine: Consequences for the International Order, NATO and Germany,” SWP, SWP Comment, April 2022, [https://www.swp-](https://www.swp-berlin.org/en/publication/russias-nuclear-threats-in-the-war-against-ukraine)

[berlin.org/en/publication/russias-nuclear-threats-in-the-war-against-ukraine.](https://www.swp-berlin.org/en/publication/russias-nuclear-threats-in-the-war-against-ukraine)

⁴ Shatabhisha Shetty and Heather Williams, *The P5 Process: Opportunities for Success in the NPT Review Conference* (London, United Kingdom: ELN and KCL, June 2020), https://www.europeanleadershipnetwork.org/wp-content/uploads/2020/06/P5-Process-Report_Final.pdf.

⁵ Gustavo Zlauvinen Twitter Account, September 2, 2022, https://twitter.com/G_Zlauvinen/status/1565794473065455618.

⁶ Emmanuelle Maitre and Benjamin Hauteceuvre, “Conference Report—P5 Track 1.5 Meeting,” FRS, January 26, 2022, <https://www.frstrategie.org/en/programs/npt-and-the-p5-process/conference-report-p5-track-15-meeting-2022>.

was hosted by France in December 2021, in which the Five stated an intent to “build on their fruitful work on strategic risk reduction within the P5 Process in the course of the next NPT review cycle, in order to reduce the likelihood of nuclear weapons use.”⁷ Additionally, after significant pressure from civil society, the group jointly agreed to the “Reagan-Gorbachev” statement that “a nuclear war cannot be won and must never be fought.” These recent statements ring hollow in light of Russia’s invasion of Ukraine, however.

The P5 have faced significant criticism in recent years for slow progress towards disarmament. Even after the 2022 Reagan-Gorbachev statement, Executive Director of the International Campaign to Abolish Nuclear Weapons, Beatrice Fihn, tweeted: “...‘bla bla bla.’ They write this “nice” statement but doing exactly the opposite in reality. They’re in a nuclear arms race, expanding nuclear arsenals, spending billions on modernizing & constantly prepared to start a nuclear war.”⁸ In 2019 evidence to a House of Lords inquiry into disarmament and the NPT,⁹ Lord Browne of Ladyton, a founder of the P5 process, also referred to it as a “cartel—a group of nuclear weapons states that in many other ways could not bear the sight of each other, but when it came to the common ownership of nuclear weapons were very good at articulating an argument as to why they needed nuclear weapons only because the rest of the world did not behave itself well enough.”¹⁰ Critics of the P5 argue that the most recent interest in strategic risk reduction is merely intended to distract from lack of real progress towards disarmament.¹¹

“Additionally, growing US-China competition in the Indo-Pacific complicates prospects for cooperation in the context of the P5 process.”

The P5 face pressure from multiple directions. There is the obvious internal pressure amongst themselves, particularly in light of Russia’s nuclear bullying in recent years, culminating in the invasion of Ukraine. The 2021 agreement between Australia, the United Kingdom, and United States (dubbed AUKUS) increased tensions between France, the United Kingdom, and the United States, and China has been openly opposed to the deal. Additionally, growing US-China competition in the Indo-Pacific complicates prospects for cooperation in the context of the P5 process. The 2021 discovery of new missile silos in China had the potential to undermine P5 cooperation and the credibility of China’s commitment to disarmament, for example.¹² While the P5 are occasionally criticized for acting in “unity,” the group is defined by its divisions and tensions more so than by a shared interest in contributing to their NPT Article VI commitment.

External pressures include supporters of the 2017 Treaty on the Prohibition of Nuclear Weapons (TPNW), which entered into force in 2021, and prohibits the possession of, and threat to use, nuclear weapons, among other activities. The TPNW and its supporters are actively targeting allies from the North Atlantic Treaty Organization (NATO) and Western democracies with a bottom-up campaign to eliminate nuclear weapons. Many non-nuclear weapon states (NNWS), even if they are not parties to the TPNW, are also growing anxious about slowing progress on disarmament, as evidenced by widespread participation, including by observers, in the first TPNW Meeting of States Parties in June 2022.¹³ While

⁷ U.S. Department of State, Bureau of Arms Control, Verification, and Compliance, “Joint Communique of the Non-Proliferation Treaty P5 Nations,” Press release, December 3, 2021, <https://www.state.gov/joint-communicue-of-the-five-nuclear-weapons-states-of-the-non-proliferation-treaty/>.

⁸ Beatrice Fihn (@BeaFihn), “As @GretaThunberg said, “bla bla bla”. They write this “nice” statement but doing exactly the opposite in reality,” Twitter, January 3, 2022, 8:16 a.m., <https://twitter.com/BeaFihn/status/1477992382843002880> and Shannon Bugos and Julia Masterson, “Non Nuclear-Weapon States Reject Nuclear War,” *Arms Control Today* 52, January/February 2022, <https://www.armscontrol.org/act/2022-01/news/npt-nuclear-weapon-states-reject-nuclear-war>.

⁹ House of Lords, Select Committee on International Relations, *Rising nuclear risk, disarmament and the Nuclear Non-Proliferation Treaty Report*, 7th report of Session 2017-2019, HL Paper 338, April 24, 2019, <https://publications.parliament.uk/pa/ld201719/ldselect/ldintrel/338/33802.htm>.

¹⁰ Maximilian Hoell, *The P5 Process: Ten Years On* (London, UK: ELN, September 2019), <https://www.europeanleadershipnetwork.org/wp-content/uploads/2019/09/190925-P5-Process-Max-Hoell-1.pdf>.

¹¹ Jamie Kwong, “Rescuing a Fraying Nuclear Nonproliferation Regime,” Carnegie Endowment for International Peace, January 13, 2022, <https://carnegieendowment.org/2022/01/13/rescuing-fraying-nuclear-nonproliferation-regime-pub-86189>.

¹² Matt Korda and Hans Kristensen, “A Closer Look at China’s Missile Silo Construction,” Federation of American Scientists, November 2, 2021, <https://fas.org/blogs/security/2021/11/a-closer-look-at-chinas-missile-silo-construction/>.

¹³ See, for example, Norway’s decision to attend as an observer. Ministry of Foreign Affairs, “Norway’s efforts to promote disarmament and non-proliferation,” Government of Norway, January 17, 2022, [https://www.regjeringen.no/en/topics/foreign-affairs/security-policy/promote_disarmament/id2890032/#:~:text=Norway%20has%20a%20high%20profile,of%20Nuclear%20Weapons%20\(TPNW\).](https://www.regjeringen.no/en/topics/foreign-affairs/security-policy/promote_disarmament/id2890032/#:~:text=Norway%20has%20a%20high%20profile,of%20Nuclear%20Weapons%20(TPNW).)

internal dynamics play a centrifugal role and seemingly push the P5 apart, external pressures to show progress on disarmament play a centripetal role and force them to continue to meet.

All P5 members face different challenges, but it is worth considering China's evolving role in the P5, in particular. Beijing is typically portrayed as opposed to transparency on nuclear weapons issues¹⁴ and any engagement on arms control,¹⁵ but it has come to see itself as a leader in the NPT and specifically in the P5 process. This narrative is rooted in three important traits of China's nuclear diplomacy. First, China maintains a no-first-use nuclear doctrine (NFU), which it claims is a "contribution to achieving the ultimate goal of a world free of nuclear weapons."¹⁶ Second, China's aggressive "wolf warrior diplomacy"¹⁷ has expanded to nuclear forums. This was noticeable in China's response to the 2021 AUKUS agreement to help Australia acquire nuclear-powered submarines. On October 29, 2021, China issued an Information Circular stating its opposition to the deal on the grounds that it posed proliferation risks and could not be sufficiently safeguarded, and it proposed that the International Atomic Energy Agency "should not engage with the three countries on the safeguards arrangement for the cooperation in question."¹⁸ Finally, China sees itself as a leader in nuclear disarmament and the NPT. It took great pride in its 2019 leadership of the P5 process following a disruption to the meeting schedule in 2017-2018, for example. The 2019 meeting in Beijing included joint commitments on safeguarding the NPT regime and strengthening dialogue between the P5 members.¹⁹

China's participation in the P5 process is unique and remains a rare and important opportunity for engaging Beijing in nuclear dialogue. If the United States wants to expand its nuclear dialogues with China on topics such as risk reduction, transparency, or pathways to disarmament, the P5 is the most likely existing forum where such discussions might occur. Other efforts could include creating a new Strategic

Stability Dialogue between Washington and Beijing, or a trilateral dialogue with Moscow, although both options seem highly unlikely in the current climate. That leaves the P5 as one of the best options for nuclear dialogue with China. The problem, however, is that Russia's invasion of Ukraine, along with other recent disputes over AUKUS, China's nuclear expansion, and wider geopolitical tensions will make it difficult for the P5 to continue to meet and demonstrate progress towards nuclear disarmament.

The future of the P5: Five scenarios

The future of the P5 will depend on events in Ukraine, along with how the P5 individually respond to Russia's aggression. Use of a weapon of mass destruction (WMD) in Ukraine or further humanitarian atrocities, for example, would make it difficult to re-engage Russia in the near future as an honest broker in P5 discussions. Conversely, a swift and peaceful resolution to the war could create an opportunity for new dialogue on escalation, crisis stability, and threat perceptions. With those caveats in mind, there are at least five scenarios for the future of the P5, ranging from its collapse to an expanded and more ambitious P5 process.

Scenario #1: Collapse

The first scenario would be if the P5 process repeatedly fails to meet, whereby the process would collapse due to inertia, or if one or more of the members formally requests to end the process. The P5 process is designed to hold annual meetings with a rotating presidency. The United States will host in 2022-2023, but if any state refuses to participate, that could throw the entire initiative into jeopardy. On the one hand, if Russia further escalates the conflict in Ukraine, such as through the use of chemical weapons, the other participants could boycott any dialogue with Moscow on humanitarian grounds. On the other hand, ending the P5 process would have serious consequences for the NPT, which is already

¹⁴ See, for example: Patty-Jane Geller and Peter Brookes, *China's Growing Nuclear Threat*.

¹⁵ See, for example: *As China Speeds Up Nuclear Arms Race, the U.S. Wants to Talk*.

¹⁶ 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, *Implementation of the Treaty on the Non-Proliferation of Nuclear Weapons in the People's Republic of China*, Submitted by China (New York, NY: UN Headquarters, November 16, 2021), <https://digitallibrary.un.org/record/3956555#record-files-collapse-header>.

¹⁷ Zhanna Malekos Smith, "New Tail for China's 'Wolf Warrior' Diplomats," CSIS, *Commentary*, October 13, 2021, <https://www.csis.org/analysis/new-tail-chinas-wolf-warrior-diplomats>.

¹⁸ The People's Republic of China, *Communication dated 29 October 2021 from the Permanent Mission of the People's Republic of China to the Agency* (Vienna, Austria: IAEA, October 29, 2021), <https://www.iaea.org/sites/default/files/publications/documents/infcircs/2021/infcir965.pdf>.

¹⁹ "Statement by H.E. Mr. Fu Cong, on Behalf of the P5 States," (speech, General Debate in the Third Session of the Preparatory Committee for the 2020 NPT Review Conference, May 1, 2019), <http://statements.unmeetings.org/media/21491982/china-behalfofthep5states-general-debate.pdf>.

in a delicate state, and could close off an important channel for dialogue amidst the crisis. The P5 would be opening themselves up to heightened criticism by NNWS that they are not serious about their Article VI commitments to pursue general and complete disarmament. From China's perspective, the collapse of the P5 would be the loss of an opportunity to advance disarmament leadership. For the United States, the collapse of the P5 could cut off one of the only channels for nuclear dialogue with China and could increase pressure from NNWS to show more progress on unilateral nuclear reductions.

Scenario #2: Minimization

A second scenario would see a minimized P5 process, either with three or four states continuing to engage, at least in the short-term. For example, the P3—France, the United Kingdom, and United States—could choose to meet separately in 2022-2023, or they might hold a P4 process with China. This scenario might keep alive the P5 process, potentially to be reinvigorated following a peaceful cessation of the conflict in Ukraine. But it could also undermine the process's contribution to the NPT as it is intended to involve all five NWS. A minimized P5 would send a dangerous signal about the shakiness of the initiative and increase uncertainty around the P5 process and, subsequently, Article VI commitments. This would perhaps be the most difficult scenario diplomatically for Beijing. A P3 process would notably deprive China of further leadership in the P5 process; however, insisting on a full P5 meeting could require China to decide if it will continue to stand with Russia.

Scenario #3: Pause and Pivot

Third, the P5 as a group could choose to pause the process to take a year off from meeting or adopt a less ambitious schedule and agenda. The P5 process and disarmament are tied to the security environment, and given the ongoing war in Ukraine, it would be a challenge to set aside geopolitical tensions. Additionally, given Russia's aggression and nuclear threats, Moscow's credibility within the P5 process might also, understandably, be called into question. A pause would allow time for the Five to determine under what conditions they will engage with each other and what they can realistically hope to achieve.

A pause is not without precedent. In 2018, for example, when Russia was meant to be the host, the P5 did not convene because of geopolitical tensions, most notably the poisoning of Sergei Skripal and his daughter by Russian agents in March in the United Kingdom.²⁰ The group successfully resumed its meetings in 2019 hosted by China, and in 2020 the United Kingdom hosted in the expectation that the process would contribute to the 2020 NPT RevCon, which was subsequently delayed due to the COVID-19 pandemic. A less dramatic option would be if the P5 continued to meet but in more private and informal settings, and with a less ambitious agenda. For example, given the security environment, risk reduction would seemingly be a priority for the group's discussions more so than some other items on the agenda.

A pause and pivot would be better than the collapse of the P5 process altogether. The danger would be uncertainty about the duration of the pause, particularly as the next RevCon will be in four years in 2026. It is crucial for the P5 to have convened and made some progress on their agenda by that time. The biggest pressure of a pivot would likely be on the United States as the 2022-2023 host of the P5 process, to be followed by Russia in 2023. Choosing not to convene or to convene privately with a less ambitious agenda would likely open Washington to criticism about a lack of commitment to disarmament and exacerbate existing polarization within the NPT. Every P5 host wants their year to be a success.

Scenario #4: Status quo ante

A fourth scenario would see the P5 process return to "business as usual" either amidst the ongoing crisis in Ukraine or following its conclusion. This will be highly dependent on events on-the-ground in Ukraine; for example, whether there is use of a WMD or further atrocities committed by the Russian military. Given the geopolitical context, returning to "business as usual" in the P5 seems inconceivable at the time of writing in summer 2022. Russia is increasingly isolated diplomatically and risks becoming an international pariah. Engaging Russia in any diplomatic setting could be a reputational risk for some members, and potentially undermine NATO unity. This scenario would likely be more favorable for Beijing than for Washington, because it

²⁰ Karen Pierce DCMG, "Evidence of Russia's Involvement in Salisbury Attack," (speech, Security Council Briefing, September 6, 2018), [https://www.gov.uk/government/speeches/you-dont-recruit-an-arsonist-](https://www.gov.uk/government/speeches/you-dont-recruit-an-arsonist-to-put-out-a-fire-you-especially-dont-do-that-when-the-fire-is-one-they-caused)

[to-put-out-a-fire-you-especially-dont-do-that-when-the-fire-is-one-they-caused.](https://www.gov.uk/government/speeches/you-dont-recruit-an-arsonist-to-put-out-a-fire-you-especially-dont-do-that-when-the-fire-is-one-they-caused)

might allow China to skirt the question of its tactic (or explicit) support for Putin's decisions. For Washington, returning to the P5 process could be at odds with its wider diplomatic strategy to isolate and condemn Russia. To be sure, the health of the NPT and the P5 process are a priority; but Russian threats to European security could trump all other issues for the time being.

Scenario #5: Expand

Finally, the P5 could not only decide to continue to meet, but also address the Ukraine crisis directly and expand the group's agenda to incorporate crisis stability and communications in light of the war in Europe. The aftermath of crises is often an opportunity to establish new guardrails and mechanisms to avoid similar situations in the future. Following the 1962 Cuban Missile Crisis, for example, the United States and Soviet Union concluded a multitude of agreements, to include the 1963 Limited Test Ban Treaty, the 1963 Hotline Agreement, the 1967 Outer Space Treaty, and the 1968 NPT. Whether the P5 are interested in returning to dialogue after the Ukraine conflict will, of course, depend on how the war ends. But if there is an appetite for reviving dialogue about risk reduction, the P5 may provide an important and available forum for discussing issues such as nuclear-conventional balance, crisis communication, and arms racing in new military technologies. This might take the form of Incidents at Sea-style Agreements, which established rules of the road and best practices for avoiding conflict between the United States and Soviet Union in a more flexible and informal format. A more modern version might take a multi-domain approach, such as an Incidents at Space Agreement,²¹ or by expanding crisis communication tools such as the Nuclear Risk Reduction Centers, to include China.

Crisis stability tools would align with the P5's existing agenda but expanding the process's agenda presents several challenges. First, the P5 agenda is already heavy to include discussion of a Fissile Material Cut-Off Treaty, the Bangkok Treaty, transparency of nuclear doctrines, emerging technologies, and a glossary of nuclear terms. Additionally, more dialogue and crisis stability tools

may not be the answer to prevent future conflict between the P5. Plenty of such tools existed prior to the invasion of Ukraine, such as the US-Russia hotline, but failed to stop Russian aggression. Expanding the P5 process would be difficult for China, in particular. China has consistently resisted overtures to engage in arms control dialogue, and many of these crisis stability tools could be interpreted as stepping stones towards more ambitious arms control mechanisms. Other members of the P5, therefore, would have to frame any discussions around a less controversial topic, such as crisis management. This scenario would also be challenging for the United States in the short-term because of distrust with Russia and Moscow's blatant geopolitical ambitions that are seemingly at odds with crisis stability.

Decisions for Beijing and Washington

Whichever proves to be the decisive scenario for the P5 will be determined by the geopolitical landscape and the denouement of the Ukraine crisis. In the meantime, China and the United States face difficult choices in how to engage the P5 process. On the one hand, both sides would benefit from continuing to lead within the process to demonstrate commitment to Article VI of the NPT and hold off pressure from NNWS. On the other hand, there is a diplomatic and political risk of engaging Russia because of potential political costs.

There is tension between China's tacit support for Russia and its narrative about leadership on nuclear disarmament and responsibility. Russian aggression in Ukraine has increased the risks of nuclear use and undermined international security. China has amplified Russian messaging to justify the invasion²² but otherwise refrained from direct military and economic support. While this ambiguity suggests that Beijing is taking a wait-and-see approach, continuing to engage Russia in the P5 process may force China to choose sides. An additional challenge for Beijing will be how to explain its new missile sites in the context of P5 discussions on transparency of doctrine.

²¹ I am grateful to the Arms Control Association for hosting a discussion on this topic, particularly insights from Ben Bahney, Shannon Bugos, and Anu Damale.

²² Ryan Flannery, "China Messaging On Ukraine Shows Support For Russia's Invasion: US State Department," *Forbes*, May 2, 2022,

<https://www.forbes.com/sites/russellflannery/2022/05/02/china-messaging-on-ukraine-shows-support-for-russias-invasion-us-state-department/?sh=33d725c41583>.

The United States also faces difficult choices. First and foremost, it must decide how to balance its plans to isolate Moscow with its commitment to engage in dialogue on nuclear weapons issues for the sake of Article VI of the NPT. Engaging Russia amidst the ongoing war could undermine America's credibility with its NATO allies and suggest a softening of Washington's position on the invasion.

None of the five scenarios listed above readily resolve all these issues for Beijing and Washington. In the near-term, the P5 might be forced to either minimize or pause their regular meeting schedule, and instead engage privately on issues of risk reduction. In addition to pausing and pivoting the P5 process, one option for Beijing would be to engage the United States in bilateral strategic stability dialogues or through multilateral forums, such as the Conference on Disarmament, to continue to demonstrate leadership in the global nuclear order. Such dialogues might also offer an opportunity for "throat clearing" on both sides about the new Chinese missile silos and AUKUS. A pause would allow the United States to focus on assuring its NATO allies and maintaining a consistent message in its diplomacy towards Russia. To avoid criticism about pausing the P5 process, however, the United States can hold private P5 meetings, focus any P5 meetings on risk reduction, and lead other disarmament initiatives in the interim. This includes the P5 Young Professional Network, which was announced in the December 2021 Communique. The group is a Track 2-led initiative and therefore does not have to be beholden to the same constraints as the P5 process itself, although it will also face challenges.

Following a pause and pivot, the P5 might then expand its agenda to include crisis stability as part of the strategic risk reduction dialogue. It will be impossible for the P5 process to ignore what has happened in Ukraine. It might be tempting for the P5 to return to seemingly more mundane issues, such as the glossary of nuclear terms, and avoid the hard topics, but failing to discuss strategic realities risks undermining the group's credibility. The P5 process, like all disarmament efforts, must reflect the security environment. Rather than an ambitious expansion of the P5 process, however, they might take lessons learned from the Ukraine war to prompt practical discussions about strategic risk reduction.

Conclusions

This paper has focused on challenges for Beijing and Washington in the potential future scenarios for the P5 process. But Russia's invasion of Ukraine also presents challenges for the wider nuclear community, most notably supporters of the TPNW and many NNWS. Putin's invasion forces all actors in the nuclear community—states, civil society, disarmament supporters, and skeptics—to face the difficult question: disarmament at what cost? If NNWS continue to pressure the P5 to meet, regardless of the security context, this could provide Russia with diplomatic and political legitimacy and be seen as the international community condoning and accepting the illegal invasion. What's more, if TPNW supporters continued to pressure the P5 to meet in the event of use of a WMD in Ukraine, this would contradict the group's wider principles of adhering to international humanitarian law and upholding international norms. This should be a moment of reckoning about the balance between disarmament and the security context.

The scenarios and recommendations offered here are intended to prompt wider thinking about the challenges for P5 members in managing both their internal tensions and external pressures. It also outlined five possible scenarios for the future of the process and how these might help or hinder wider efforts in Beijing and Moscow. While for now the most likely scenario seems to be a possible pause and pivot in the group's work, this should not be cause for long-term pessimism about the P5 process itself. The P5 process remains a unique and valuable forum for disarmament dialogue. Establishing it and advancing its agenda to this stage were not easy tasks. They are worth maintaining.

4

A bridge too far: US-China cooperation on the Korean Peninsula

Duyeon Kim

Prospects appear bleak for the United States and China to work together toward making progress on denuclearization and peace on the Korean Peninsula. For one, North Korea is squarely focused inward. The Kim Jong Un regime is preoccupied with expanding its nuclear arsenal that includes a particular focus on developing tactical nuclear weapons and multiple warheads that can fit inside intercontinental ballistic missiles (ICBM). Pyongyang has also prioritized internal stability—including strengthening self-reliance for economic development—and has repeatedly rejected overtures by the United States to resume diplomatic talks. Not only does its refusal to return to dialogue indicate that Pyongyang is currently uninterested in diplomacy, but the regime seems to fear the importation of the coronavirus through direct contact with foreigners, further indicated by its refusal to receive vaccines and humanitarian aid offered by the United States, South Korea, and the COVID-19 Vaccines Global Access (COVAX).

China, for its part, does not appear interested in cooperating with the United States on the North Korean nuclear issue. While, in theory, the heated US-China strategic competition should not prevent the two rivals from cooperating on challenges of mutual concern, the geopolitical environment portends that, in practice, more tensions are underway as both sides prioritize competition over cooperation. Against this backdrop, Beijing may view a nuclear-armed Pyongyang as a strategic asset. Even when US-China relations were relatively less tense than they are today, their cooperation on the North Korean nuclear issue led to either little progress or unsustainable progress.

Therefore, the United States will need to double down efforts with its allies and partners to deter future North Korean provocations while continuing to find opportunities to resume diplomatic talks with Pyongyang. The current geopolitical climate also means that Washington and Beijing will need to work separately to prevent a potential crisis on the Korean Peninsula. Any US-China cooperation in seeking progress on denuclearization and peace might be contingent upon an improvement in bilateral relations, a crisis regarding North Korea that prompts Chinese involvement, or a convergence of the two circumstances.

North Korea's nuclear gambit and national pursuits

It has become clear over the past several years that Pyongyang has military imperatives to push ahead with nuclear weapons development regardless of its external environment. Its increasingly unprecedented number of missile tests in a given year have further demonstrated that those provocations are not necessarily aimed at extracting the attention of the United States. This year, in particular, is apparently devoted to producing advanced nuclear weapons and strengthening internal stability in North Korea.

Strategic goals

In January 2021, Kim Jong Un convened the 8th Party Congress during which the military dimensions of his country's five-year plan placed emphasis on developing tactical nuclear weapons and high-tech weapons. He claimed that Pyongyang "already accumulated nuclear technology [which had] underwent a rapid development to minimize and standardize nuclear weapons and make them tactical ones and complete the development of a super-large hydrogen bomb," according to official state media that summarized Kim's report.¹ Kim also claimed that "super-large MLRS [multiple launch rocket system], a super-power attack weapon never to be seen in the world history of weapons, was developed in the field of national defence science, which was followed by the development of ultra-modern tactical nuclear weapons including new type tactical rockets and intermediate-range cruise missiles with the most powerful warheads in the world."²

These statements, if true, and Pyongyang's pursuit for tactical nuclear weapons should not have been a surprise to Korea watchers. North Korea had been demonstrating its aim to develop what it had been describing to be "tactical guided weapons" through a series of short- and intermediate-range ballistic missile tests for several years leading up to Kim's 8th Party Congress address. In 2014, for example, North Korea claimed that Kim directed a "guided missile test-fire" that possessed "tactical and technical information of the guided missiles," which were later described as "tactical guided missiles" in the same

¹ KCNA, "On Report Made by Supreme Leader Kim Jong Un at 8th Congress of WPK," January 9, 2021, <https://kcnawatch.org/newstream/1610155111->

[665078257/on-report-made-by-supreme-leader-kim-jong-un-at-8th-congress-of-wpk/](https://kcnawatch.org/newstream/1610155111-665078257/on-report-made-by-supreme-leader-kim-jong-un-at-8th-congress-of-wpk/).

² Ibid.

media report.³ In November 2018, Pyongyang claimed to have tested an “ultramodern tactical weapon”⁴ and in 2019, it engaged in a testing binge of short-range ballistic missiles, some of which were described as “tactical guided weapon[s].”⁵

Most recently in January 2022, North Korea claimed to have tested “tactical guided missiles” to “selectively evaluate tactical guided missiles being produced and deployed and to verify the accuracy of the weapon system.”⁶ In April, North Korea claimed to have tested a “new-type tactical guided weapon...[that] is of great significance in drastically improving the firepower of the frontline long-range artillery units and enhancing the efficiency in the operation of tactical nukes,” according to its state media.⁷

Tactical nuclear weapons are dangerous for several reasons, notably their ability to start a war whether it is by miscalculation, retaliation, or preemption.⁸ The threshold for nuclear-weapons use would be even lower. The short- and mid-range missiles North Korea has been testing are designed to evade missile defenses. The purpose of developing tactical nuclear weapons would be for Pyongyang to use them on the battlefield during a conflict, to quickly end a conflict, or to deter the United States and South Korea from waging a military campaign to end the Kim regime. The battlefield would be the Korean Peninsula—specifically targeting South Korea and US bases there. From Pyongyang’s standpoint, targeting US bases with tactical nuclear weapons makes sense because the North Korean military does not have enough conventional warheads to meaningfully damage such bases and prevent a conventional US invasion of North Korea. It would now be able to do so, while reserving its ICBMs and thermonuclear bombs (or H-

bomb) to deter the United States from retaliatory annihilation of North Korea.⁹

Therefore, it is possible that North Korea is focusing on tactical nuclear weapons to strengthen deterrence on two levels because it presumably has achieved the ability to strike the US homeland with ICBMs. Even if all its missiles and weapons systems it claims to have successfully produced are still in their rudimentary stages, Pyongyang’s proclamations are still meaningful—they indicate North Korea’s goals for its nuclear milestones, and it is only a matter of time until the regime perfects its technology.

In addition to tactical nuclear weapons, North Korea aims to possess capabilities including thermonuclear weapons, solid fuel road-mobile ballistic missiles, submarine-launched ballistic missiles, hypersonic glide vehicles, satellite launch vehicles, cruise missiles, and multiple reentry vehicles.¹⁰

Internal stability and rural development

Kim Jong Un’s marching orders for his people this year are to continue to drive toward self-reliance, economic development, nuclear development, and ideological campaigns to weed out practices that go against socialism. The December 2021 Workers Party Plenum’s agenda indicated six items, among which the third was solving the country’s “socialist rural question.” Such language appears to indicate a further tightening of state control across the board and distancing from market-oriented economic reforms. The agenda placed heavy emphasis on developing and modernizing North Korea’s farming and rural communities, focused on agriculture and food production. This appears to demonstrate Kim’s priority on economic growth, possibly due to apparent failures in achieving last year’s economic

³ “Kim Jong Un directs guided missile test-fire,” KCNA, June 27, 2014, <https://kcnawatch.org/newstream/1450716692-57878244/kim-jong-un-directs-guided-missile-test-fire/?t=1631761513204>.

⁴ Choe Sang-hun, “North Korea Says It Has Tested ‘Ultramodern Tactical Weapon,’” *The New York Times*, November 15, 2018, <https://www.nytimes.com/2018/11/15/world/asia/north-korea-tests-tactical-weapon.html>.

⁵ Euan McKirdy and Jake Kwon, “North Korea tests ‘tactical’ weapon, report says,” CNN, April 18, 2019, <https://edition.cnn.com/2019/04/17/asia/north-korea-suspected-weapon-test-intl/index.html>; “Supreme Leader Kim Jong Un Guides Power Demonstration Fire of New-Type Tactical Guided Weapon,” KCNA, July 26, 2019, <https://kcnawatch.org/newstream/1564209011-729533733/supreme-leader-kim-jong-un-guides-power-demonstration-fire-of-new-type-tactical-guided-weapon/?t=1635815371395>.

⁶ “Test-fire of Tactical Guided Missiles Held,” KCNA, January 18, 2022, <https://kcnawatch.org/newstream/1642559552-183955421/test-fire-of-tactical-guided-missiles-held/>.

⁷ “Respected Comrade Kim Jong Un Observes Test-fire of New-type Tactical Guided Weapon,” KCNA, April 17, 2022,

<https://kcnawatch.org/newstream/1650148541-201904910/respected-comrade-kim-jong-un-observes-test-fire-of-new-type-tactical-guided-weapon/?t=1664109024795>; “North Korea tests new weapon ‘to improve tactical nukes,’” BBC, April 17, 2022, <https://www.bbc.com/news/world-asia-61133225>.

⁸ Duyeon Kim, “North Korea’s ‘Tactical-Guided’ Ballistic Missile Test is No Joke for Biden and South Korea,” *Bulletin of the Atomic Scientists*, April 1, 2021; Duyeon Kim and Melissa Hanham, “North Korean Missiles: Size Does Not Matter,” *Bulletin of the Atomic Scientists*, May 15, 2019.

⁹ Vipin Narang, “Why Kim Jong Un Wouldn’t be Irrational to Use a Nuclear Bomb First,” *The Washington Post*, September 8, 2017, https://www.washingtonpost.com/outlook/why-kim-jong-un-wouldnt-be-irrational-to-use-a-nuclear-bomb-first/2017/09/08/a9d36ca4-934f-11e7-aace-04b862b2b3f3_story.html.

¹⁰ “On Report Made by Supreme Leader Kim Jong Un at Eighth Party Congress of WPK,” KCNA, January 9, 2021, https://www.ncnk.org/resources/publications/kju_8th_party_congress_speech_summary.pdf/file_view.

plans. Economic development and prosperity are one vital component that reinforces Kim's legitimacy as a ruler.¹¹

Despite North Korea having claimed to have maintained a zero-COVID situation throughout the pandemic, it admitted for the first time to have struggled with the Omicron BA.2 variant, according to state-media reporting on a Politburo Meeting of the Workers Party's 8th Central Committee in May 2022.¹² Kim also reportedly stressed that their country's "epidemic prevention...cannot block our advance toward the overall development of socialist construction, and there should be nothing missed in the planned economic work."¹³

Meanwhile, the Biden administration has repeatedly called for dialogue without preconditions since last year through private and official channels.¹⁴ Diplomatic sources have told the author that the Biden administration made a dozen or more attempts of contacting Pyongyang to resume talks. However, North Korea has continued to refuse dialogue. Instead, it has threatened to "wipe out" enemies, accusing the United States and South Korea of bringing the Peninsula to the "brink of war" ahead of their first large-scale combined military exercises in four years in August 2022.¹⁵

China's strategic liability to strategic asset

Some Chinese scholars have long argued that North Korea's nuclear and missile programs are fundamentally opposed to Chinese core interests.¹⁶ In other words, these experts have claimed that North Korea has been a strategic liability to China because

its nuclear advancements provided a pretext for the United States to reinforce its military presence in East Asia, even though a nuclear-capable North Korea served as a buffer between Beijing and Washington. Yet since the early 2000s a debate has emerged in the Chinese policy community on whether North Korea is a strategic asset or strategic burden for Beijing.¹⁷

Official Chinese statements have long maintained that Beijing's policy is the denuclearization of the Korean Peninsula, while China has supported United Nations (UN) Security Council Resolutions condemning and punishing North Korean nuclear tests and ballistic missile tests. However, in February 2022, Chinese President Xi Jinping vowed to continue to develop China-North Korea relations "under a new situation," according to North Korean state media.¹⁸ Neither side specified publicly what a "new situation" meant, but it could have implied expected geopolitical shifts following Russia's invasion of Ukraine and a tense US-China strategic competition. Furthermore, in May 2022, Beijing and Moscow vetoed a draft UN Security Council Resolution for the first time that was aimed at strengthening sanctions against North Korea following Pyongyang's previous 16 rounds of missile tests this year.¹⁹ These two indicators in February and May seem to suggest that China might be viewing North Korea as a strategic asset.

Alliance of autocracies

The current geopolitical climate and China's recent behaviors indicate that a nuclear-armed North Korea may have become a strategic asset to Beijing in countering what it perceives as Washington's anti-

¹¹ Duyeon Kim, "North Korea's Goals in 2022: Internal Stability and Nuclear Development," *Bulletin of the Atomic Scientists*, January 13, 2022, <https://thebulletin.org/2022/01/north-koreas-goals-in-2022-internal-stability-and-nuclear-development/#post-heading>.

¹² Michelle Lee and Min Joo Kim, "North Korea Admits to Coronavirus Outbreak for the First Time," *The Washington Post*, May 12, 2022, <https://www.washingtonpost.com/world/2022/05/11/north-korea-coronavirus-omicron/>.

¹³ Rodong Shinmun, "8th Political Bureau Meeting of 8th Central Committee of WPK Held," May 12, 2022, http://rodong.rep.kp/en/index.php?strPageID=SF01_02_01&newsID=2022-05-12-0003.

¹⁴ See: "US Envoy Offers to Meet North Korea 'Anywhere Anytime,'" VOA, June 21, 2021, <https://www.voanews.com/a/east-asia-pacific-us-envoy-offers-meet-north-korea-anywhere-anytime/6207269.html>; and Sung Kim, "U.S. Special Representative to the Democratic People's Republic of Korea Sung Kim On Recent DPRK Missile Launches," *U.S. Department of State*, June 7, 2022, <https://www.state.gov/u-s-special-representative-to-the-democratic-peoples-republic-of-korea-sung-kim-on-recent-dprk-missile-launches/>.

¹⁵ Christian Davies, "Kim Jong Un Says Korean Peninsula on the 'Brink of War,'" *Financial Times*, July 28, 2022, <https://www.ft.com/content/7fd4933-ea2d-4151-8f09-f98e2715e8c7>.

¹⁶ Zhu Feng, "China's North Korean Liability," *Foreign Affairs*, July 11, 2017, <https://www.foreignaffairs.com/articles/china/2017-07-11/chinas-north-korean-liability>.

¹⁷ For more, see: You Ji, "Understanding China's North Korea Policy," *China Brief*, Vol. 4, Issue 5, March 8, 2004, <https://jamestown.org/program/understanding-chinas-north-korea-policy/>; Heungkyu Kim, "From a Buffer Zone to a Strategic Burden: Evolving Sino-North Korea Relations During the Hu Jintao Era," *The Korean Journal of Defense Analysis*, Vol. 22, Issue 1, 2010, pp. 57-74; International Crisis Group, "Shades of Red: China's Debate Over North Korea," *Asia Report*, No. 179, November 2, 2009.

¹⁸ Heekyong Yang, "China's Xi, in Message to N. Korea's Kim, Vows Cooperation Under 'New Situation' -KCNA," *Reuters*, February 26, 2022, <https://www.reuters.com/world/china/chinas-xi-message-nkoreas-kim-vows-cooperation-under-new-situation-kcna-2022-02-25/>.

¹⁹ Samantha Beach, "China and Russia Veto New UN Sanctions on North Korea for First Time Since 2006," *CNN*, May 27, 2022, <https://edition.cnn.com/2022/05/26/asia/us-north-korea-united-nations-intl-hnk/index.html>.

China coalition as well. Beijing might see more value in winning Pyongyang over to its side—during its strategic competition with an “alliance of autocracies”²⁰ or “Autocracy, Inc.”²¹ against the United States—rather than proactively cooperating with Washington for peace and stability on the Korean Peninsula through denuclearization.

Therefore, US-China cooperation on the North Korean nuclear issue appears slim to none in the foreseeable future. Instead of viewing Pyongyang’s nuclear pursuits and provocations as the destabilizer in the region, Beijing has been flipping the script by pointing to US-led sanctions against North Korea’s illegal behavior as being unhelpful in the current tense situation and blaming Washington for North Korea’s nuclear pursuits.²²

For example, some China experts say that Xi Jinping might perceive the Kim regime’s value in potentially teaming up to deter the United States if Beijing decides to seize control of Taiwan.²³ The tactical nuclear weapons that Kim Jong Un is squarely focused on perfecting through repeated tests can target US bases in South Korea and Japan. Some South Koreans who are China experts and former diplomats say that Pyongyang could assist Beijing by engaging in provocations along the inter-Korean border²⁴ or even attacking US bases²⁵ to distract and prevent the United States from swiftly mobilizing its forces to respond to a potential crisis in Taiwan, the South China Sea, or Taiwan Strait.

Another example is that Beijing might believe North Korea’s nuclear-tipped missiles could fracture Washington’s Asian alliances. Proponents of this hypothesis believe that Seoul and Tokyo may opt to focus their military’s attention on the Korean Peninsula rather than support US operations in other parts of Asia.²⁶

A spotty record of cooperation

The last time the United States and China genuinely cooperated on the North Korean nuclear issue was during the Six Party Talks that began in 2003 among the two Koreas, the United States, Japan, China, and Russia. The six countries agreed on denuclearization, peace, and normal relations between North Korea and the United States, among others, as stipulated in the September 2005 Six Party Talks Joint Statement. That agreement was the closest the United States and China came to a workable multilateral solution. However, the Six Party Talks process broke down in 2008 before significant denuclearization measures were achieved.²⁷

While Beijing’s role quickly evolved into that of a scheduler as the host of the multilateral dialogue, it was still involved in the six-way negotiations and supported three agreements that were struck aimed at freezing, disabling, and dismantling North Korea’s nuclear program.

From 2006 to 2016, China has supported all UN Security Council Resolutions after each North Korean nuclear test. However, China has been lukewarm in enforcing its sanctions obligations to penalize illegal North Korean activities stipulated in resolutions passed after both nuclear and ballistic missile tests. Beijing has also been found to violate UN sanctions resolutions on numerous occasions, documented by UN Panel of Experts reports,²⁸ while attempting to block violations from being documented in those reports.²⁹

Still, in August 2017, China showed unprecedented cooperation when it supported UN Security Council Resolution 2371 in response to North Korea’s two inter-continental ballistic missile tests the previous month. Diplomatic sources have confirmed that Beijing even enforced those sanctions obligations,

²⁰ David Leonhardt, “A New Axis,” *The New York Times*, February 9, 2022, <https://www.nytimes.com/2022/02/09/briefing/china-russia-alliance.html>.

²¹ Anne Applebaum, “America Needs a Better Plan to Fight Autocracy,” *The Atlantic*, March 16, 2022, <https://www.theatlantic.com/ideas/archive/2022/03/russia-ukraine-senate-testimony-autocracy-kleptocrats/627061/>.

²² Michelle Nichols, “After Veto on North Korea, China says ‘Let’s See’ on U.N. Action Over a Nuclear Test,” *Reuters*, June 10, 2022, <https://www.reuters.com/world/asia-pacific/after-veto-north-korea-china-says-lets-see-un-action-over-nuclear-test-2022-06-09/>.

²³ Interview of South Korean experts and former diplomats, June 2022.

²⁴ Former South Korean Foreign Minister Yu Myung-hwan’s remarks at the “Alliance Peace Conference,” Korea Defense Veterans Association, Washington, DC, July 27, 2002.

²⁵ Interview of Choo Jae-woo, Professor of Chinese Foreign Policy, Department of Chinese Studies, Kyung Hee University, Seoul, June 2022.

²⁶ Sungmin Cho and Oriana Skylar Mastro, “North Korea Is Becoming an Asset for China,” *Foreign Affairs*, February 3, 2022, <https://www.foreignaffairs.com/articles/north-korea/2022-02-03/north-korea-becoming-asset-china>.

²⁷ The Six Party Talks broke down in December 2008 during the second phase of denuclearization called disablement and could not begin the third and final stage of dismantlement. North Korea blamed the United States for moving the goal posts of verification sooner than originally planned.

²⁸ See Final Reports of the Panel of Experts of UN S/2013/337, S/2015/131, and S/2016/73, https://www.un.org/securitycouncil/sanctions/1718/panel_experts/reports.

²⁹ Colum Lynch, “‘It Was Like Having the Chinese Government in the Room with Us,’” *Foreign Policy*, October 15, 2021, <https://foreignpolicy.com/2021/10/15/china-sanctions-north-korea-hardball/>.

apparently concerned about the Donald Trump administration's threats to impose secondary sanctions against Chinese entities and individuals involved in North Korea's nuclear program and illicit activities.³⁰

China continued to cooperate with the United States and the UN Security Council by supporting and apparently enforcing Resolution 2375 after Pyongyang's sixth nuclear test in September 2017 and Resolution 2397 in December in the UN Security Council's response to an ICBM launch the previous month. Beijing has been the most proactive and cooperative in implementing post-2016 sectoral sanctions. However, China soon loosened sanctions and failed to fulfill its sanctions-enforcement obligations when summitry began with the 2018 Winter Olympics that led to inter-Korean summits and successive Trump-Kim summits.

A recent indicator of gloomy prospects for any US-China cooperation surfaced in May 2022 when Beijing and Moscow vetoed the passage of a UN Security Council resolution mentioned earlier. Chinese Ambassador to the UN Zhang Jun asserted that Beijing did "not think additional sanctions will be helpful in responding to the current situation."³¹ The veto also further demonstrates Beijing's eagerness to advocate for North Korea's so-called legitimate security interests—lifting sanctions against North Korea and canceling US-South Korea military exercises in return for Pyongyang's moratorium on nuclear and missile tests—rather than suspending and rolling back North Korea's nuclear weapons arsenal. Some experts have explained that China's perception of the nonproliferation regime, interests, and institutional environment have both driven and limited Beijing's cooperation with international sanctions.³²

North Korea's 7th nuclear test

It remains an open question as to whether Beijing will cooperate at the UN Security Council after North Korea's expected seventh nuclear test. On the one hand, some experts and government officials point to Beijing's historical record of supporting UN Security

Council Resolutions penalizing nuclear tests, which they hope are Beijing's "red line." Some government officials in other stakeholder countries have also confirmed that Beijing is quietly trying to dissuade Pyongyang from conducting another nuclear test.³³

On the other hand, Chinese officials, in private conversations, continue to blame Washington for the current state of tensions and North Korea's nuclear ambitions, while openly calling for the lifting of sanctions and echoing Pyongyang's demands to break the diplomatic stalemate. These indicators, amid an intensifying US-China strategic competition, suggest that Beijing may not support another UN Security Council Resolution, especially if the radiation fallout from a seventh nuclear test does not affect China.

The veto by China and Russia also demonstrates that the consensus among the permanent five members of the UN Security Council maintained since North Korea's first nuclear test in 2006 has now been broken. US Ambassador to the UN Linda Thomas-Greenfield pointed out that China and Russia have blocked "every attempt to enforce and to update DPRK sanctions" over the past four years, which has enabled Pyongyang to resume its "unlawful" activities.³⁴ A divided UN Security Council would only embolden and provide a license for Pyongyang to push ahead toward its next phase of nuclear armament plans.

China's response will be another significant indicator of Beijing's political and strategic calculations, as well as of whether and what type of US-China cooperation would be possible going forward.

Policy recommendations: The United States' role

In light of this analysis—North Korea's internal preoccupations and China's focus on geopolitics—Washington will need to work alone and with allies and partners in Asia and Europe until Pyongyang and Beijing are ready to cooperate. The following is not an exhaustive list of recommendations:

³⁰ Author's interviews of U.S. officials during the Trump administration.

³¹ Byun Duk-kun, "U.N. Security Council fails to pass N. Korea resolution due to opposition by China, Russia," *Yonhap News Agency*, May 27, 2022, <https://en.yna.co.kr/view/AEN20220527000400325>.

³² Kiyun Lee and Jangho Kim, "Cooperation and Limitations of China's Sanctions on North Korea: Perception, Interest, and Institutional Environment," *North Korean Review*, Vol. 13, No. 1, Spring 2017, pp. 28-44.

³³ Author's conversations with diplomats in stakeholder countries involved in their respective country's North Korea policy, July 2022.

³⁴ Ibid.

Strengthen military readiness and maintain a strong deterrence posture with South Korea and Japan

The United States and South Korea should strengthen their combined military readiness. It is good news that both the new South Korean government under Yoon Suk-yeol and the Biden administration are eager to strengthen deterrence and return to normal exercises and training, which were either suspended or scaled down during the Trump and Moon administrations. This is especially important if North Korea wages another conventional attack similar to the ones in 2010—when it sunk South Korea's Cheonan corvette and shelled Yeonpyeong Island killing soldiers and civilians—and as Pyongyang is determined to develop tactical nuclear weapons.

“Strengthening deterrence will come with South Korean demands for more visible measures and exercises to assure South Koreans of US defense commitments and resolve as well as to send a strong deterrent message to North Korea.”

A robust deterrence posture should continue to seek to prevent another war and nuclear use, while providing the ability to respond readily to any North Korean provocation or limited attack. Strengthening deterrence will come with South Korean demands for more visible measures and exercises to assure South Koreans of US defense commitments and resolve as well as to send a strong deterrent message to North Korea.

The allies should hold frank conversations soon on what exactly South Korea means by wanting stronger extended deterrence measures—including “nuclear sharing” even if this is not yet the Korean

government's official position—and why Washington will not support some of them or the permanent deployment of certain strategic assets to Korea.

Strengthening deterrence will also require strengthening interoperability—technical, human, and procedural—among the United States, South Korea, and Japan vis-à-vis North Korea and even China. The three allies could revive the Trilateral Consultation and Oversight Group (TCOG) that was established during the Bill Clinton administration to coordinate policy and contingencies. They should also revitalize combined trilateral military drills and defense cooperation that were suspended five years ago.

The Yoon government's strong political will to improve relations with Japan and public talk about “normalizing” an intelligence-sharing agreement (General Security of Military Information Agreement) also indicate positive prospects for trilateral cooperation among the United States, Japan, and South Korea on areas of mutual concern like North Korea.³⁵

Continue to use diplomatic negotiations as the main foreign policy tool to denuclearize North Korea, and continue to offer COVID vaccines and humanitarian aid

Washington should continue to publicly and privately communicate to Pyongyang that the door is open for dialogue and that it is prepared to provide COVID vaccines. Negotiations remain the best method to address all parties' concerns and eventually achieve denuclearization, peace, and normal relations. While several factors seem to explain North Korea's refusal to return to the negotiating table, as explained above, the most immediate variable might be Pyongyang's fear of contracting the coronavirus. Whether there is a correlation or not, there is still an urgent need to vaccinate the North Korean people to prevent a potential humanitarian crisis. China might have provided vaccines to North Korea before its COVID outbreak earlier this year, according to media reports of Chinese data citing \$311,126-worth of unidentified vaccines.³⁶ Until then, diplomatic sources since the beginning of the pandemic claimed that North Korea

³⁵ Song Sang-ho, “Talk of ‘Normalizing’ GSOMIA Raises Hope, Skepticism Around Seoul-Tokyo Ties,” *Yonhap News*, June 15, 2022, <https://en.yna.co.kr/view/AEN20220615003900325>.

³⁶ Stella Qiu, Ellen Zhang and Josh Smith, “North Korea Stockpiled Chinese Masks, Vaccines Before Reporting COVID Outbreak,” *Reuters*, May 27, 2022, <https://www.reuters.com/world/asia-pacific/nkorea-stockpiled-chinese-masks-vaccines-before-reporting-covid-19-outbreak-2022-05-27/>.

did not trust Chinese or Russian vaccines. The Kremlin has reportedly said that it would consider any request by North Korea to send COVID vaccines.³⁷

Consult, plan, and prepare with allies for potential kinetic North Korean provocations

The United States and its Asian allies should hold both policy and operational conversations as soon as possible on how they might respond to any kinetic North Korean action and any accidents that could arise from missile tests. In the first scenario, President Yoon's advisors and his military would want to retaliate immediately in kind with force, which requires not only a basic playbook but a frank discussion with the United States on how to respond without inadvertently escalating tensions or triggering conflict. In the latter scenario, the allies could also prepare response plans to any debris that might fall on Japanese territory after North Korean missile tests.

Even in 2010 when the allies were presumed to be more ready than they are now—thanks to continued practices, training, and exercises—there was some confusion and disarray in the immediate aftermath of the shelling of South Korea's Yeonpyeong Island on how South Korea should respond.³⁸

Include North Korean nuclear coercion and nuclear-use scenarios in US-South Korea deterrence exercises

The Russian invasion of Ukraine might have provided some ideas to North Korea about when to use nuclear weapons and how to threaten their use, even though the regime has long maintained a nuclear-first-use policy. In April, Kim Jong Un pronounced that his nuclear weapons "can never be confined to the single mission of war deterrent," thereby threatening to use them preemptively if it felt threatened by Washington.³⁹ It would be prudent, therefore, for Washington and Seoul to include

nuclear coercion and nuclear-use scenarios in their combined military and deterrence exercises.⁴⁰

Gaming out these scenarios should happen between both military officers and policy officials. The Biden administration, then, should be prepared for the possibility of Seoul pressing for a frank conversation on the circumstances under which Washington might use nuclear weapons against North Korea. President Biden's Nuclear Posture Review stated that the United States "would only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the United States or its allies and partners."⁴¹ However, South Korean conservative administrations in particular are interested in knowing details.

On potential scenarios of using nuclear weapons, North Korea seems to maintain a nuclear first-use policy even though Kim Jong Un declared at his 7th Workers' Party Congress in 2016 that his country would not use nuclear weapons first unless its "sovereignty is encroached upon by hostile aggression forces with nukes."⁴² Back then, they started using the words "no first use" publicly, but conversations with North Korean diplomats—pressing them deeper on details—demonstrated that they did not seem to understand the definition and circumstances of no-first use.⁴³

However, North Korea's official comments and the types of nuclear weapons and weapons systems it aims to manufacture, particularly tactical nuclear weapons explained above, suggest that it has a nuclear first-use strategy. In other words, the Kim Jong Un regime appears to have adopted what Vipin Narang calls an asymmetric escalation strategy in which a state develops capabilities "that credibly enable the rapid and first use of nuclear weapons in the event of a conventional attack" as well as a nuclear attack.⁴⁴ Most recently in April 2022, Kim warned that his use of nuclear weapons "can never be confined to the single mission" of deterrence.⁴⁵

³⁷ "Russia Would Consider North Korea Request for COVID Vaccine Supply," *Reuters*, May 13, 2022, <https://www.reuters.com/world/asia-pacific/russia-would-consider-north-korea-request-covid-vaccine-supply-2022-05-13/>.

³⁸ Author's conversations with South Korean officials, 2010.

³⁹ Yi Wongju and Chae Yun-hwa, "In Military Parade, N. Korean Leader Vows to Strengthen Nuclear Power," *Yonhap News*, April 26, 2022, <https://en.yna.co.kr/view/AEN20220426005352325>.

⁴⁰ Duyeon Kim, "Deterring Aggression Through Joint and Combined Readiness," *Land Forces Pacific Symposium*, May 18, 2022.

⁴¹ "Fact Sheet: 2022 Nuclear Posture Review and Missile Defense Review," U.S. Department of Defense, March 29, 2022, <https://media.defense.gov/2022/Mar/29/2002965339/-1/-1/1/FACT-SHEET->

[2022-NUCLEAR-POSTURE-REVIEW-AND-MISSILE-DEFENSE-REVIEW.PDF](https://www.ncnk.org/sites/default/files/content/resources/publications/KJ_U_Speeches_7th_Congress.pdf).

⁴² The National Committee on North Korea, "Document from the 7th Workers' Party Congress," https://www.ncnk.org/sites/default/files/content/resources/publications/KJ_U_Speeches_7th_Congress.pdf.

⁴³ Author's conversations with North Korean diplomats, June 2015.

⁴⁴ Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict*, Princeton University Press, 2014, p. 8.

⁴⁵ Josh Smith, Soo-hyang Choi and Hyonhee Shin, "N. Korea's Kim Vows to Boost Nuclear Arsenal as Parade shows ICBMs," *Reuters*, April 27, 2022, <https://www.reuters.com/world/asia-pacific/nkorea-displays-icbms-parade-vows-boost-nuclear-arsenal-2022-04-26/>.

Asymmetric escalation is a different strategy than what has long been the conventional belief among North Korea watchers of an assured retaliation posture in which a second-strike nuclear capability would be developed to threaten nuclear retaliation against a nuclear attack.⁴⁶

Work with Asian and European allies and partners to impose sanctions on cybercrimes and illicit digital financial activities. Employ a comprehensive policy incorporating tools spanning diplomatic, economic, political, gray-zone tactics, and modern deterrence.

The United States—in cooperation with its Asian and European allies and partners—should target the regime's sources of funding and resources for its nuclear weapons program to slow down North Korea's nuclear-weapons development. Sanctions have been the main tool for this, which have been challenging because of North Korea's self-imposed isolation due to the coronavirus pandemic as well as Chinese and Russian refusal to implement them.

However, more could and should be done with sanctions against North Korea's cyber activities and cybercrimes including cryptocurrency, believed to be a major source of funding for North Korea's nuclear weapons development.⁴⁷ Washington should also enforce secondary sanctions against Chinese and Russian entities and individuals that assist North Korea's nuclear, missile, and illegal financial activities.

Finally, there should be a comprehensive policy that incorporates a spectrum of tools spanning diplomatic, economic, political, modern and tailored and integrated deterrence, and gray-zone tactics. This is especially important because the security and traditional deterrence landscape is further complicated by the rise in gray-zone tactics by all three regimes—China, Russia, and North Korea. They highlight the limitations of military force alone to deter such actions. Deterrence based only on military measures, therefore, will not be effective. Strategies and tools such nuclear deterrence can no longer be contemplated and utilized in isolation from other strategic and policy considerations.

Policy recommendations: China's role

It would be in China's interest to manage and slow down Pyongyang's nuclear advancements even if a nuclear-armed North Korea might be a strategic asset for Beijing. There are steps that China could take alone to achieve these aims. The following is not an exhaustive list of recommendations:

Dissuade North Korea from conducting a seventh nuclear test

China's Northeastern region bordering North Korea could become contaminated due to radiation fallout from another nuclear test. It would also invite a "swift and forceful response" from the United States and the international community, as warned by US Deputy Secretary of State Wendy Sherman.⁴⁸ Diplomatic sources have indicated that such a response entails additional sanctions including secondary sanctions against Chinese and Russian entities and individuals.⁴⁹ The United States and South Korea would most likely deploy US strategic assets to the Peninsula, to which Beijing is opposed. Finally, Beijing would be forced into an awkward position at the UN Security Council and ahead of China's National Party Congress in November when Xi Jinping is expected to be reelected as president.

Explain to North Korea that COVID-19 vaccines are safe and that there are safe ways to receive them from overseas

A threat more urgent than that of nuclear weapons is the potential for a coronavirus outbreak that breeds new, dangerous variants in a country whose population is believed to be unvaccinated.⁵⁰ As mentioned above, North Korea has been rejecting vaccines offered by the international community. In the first year of the pandemic, North Korea demanded that COVAX be held legally responsible for any deaths or adverse side effects from the vaccines. If the North Korean leadership is concerned about importing the virus from direct contact with foreigners, including during diplomatic talks with

⁴⁶ Ibid.

⁴⁷ BBC, "North Korea: Missile Programme Funded Through Stolen Crypto, UN Report Says," February 6, 2022, <https://www.bbc.com/news/world-asia-60281129>.

⁴⁸ Kim Eun-jung and Song Sang-ho, "N. Korea to Face 'Swift, Forceful' Response in Case of Nuke Test: Sherman," *Yonhap News*, June 7, 2022, <https://en.yna.co.kr/view/AEN20220607001153325>.

⁴⁹ Author's discussions with diplomatic sources, June 2022.

⁵⁰ Victor Cha, Katrin Fraser Katz and J. Stephen Morrison, "Dangerous Covid Variants Could Emerge from North Korea if the World Doesn't Act," *The Washington Post*, March 23, 2022, <https://www.washingtonpost.com/opinions/2022/03/23/north-korea-could-be-breeding-ground-covid-variants-vaccines/>.

the United States, then this would be another reason to try to persuade Pyongyang to vaccinate its people.

Persuade Pyongyang to return to the dialogue table with the United States without preconditions and allow negotiations to function properly

This may contradict arguments that China appears to view North Korea as a strategic asset. However, it would still be in China's interest to limit and eventually roll back Pyongyang's nuclear weapons program. North Korea has free range to advance its nuclear weapons capabilities in the absence of a denuclearization-peace agreement. It means that the United States would have no choice but to increase and strengthen its military presence in the region as well as its posture with South Korea and Japan, all of which Beijing has opposed. It also means that Pyongyang's nuclear weapons could be pointed at China while prompting more South Koreans and Japanese to call on their respective governments to produce independent nuclear deterrents. All these phenomena would not serve China's interests in the region.

The challenge, however, is how to resume dialogue between Washington and Pyongyang. North Korea's preconditions for talks before the coronavirus pandemic included the lifting of key sanctions, the termination of US-South Korea combined military drills, and an end to what it claims to be a "hostile US policy." Pyongyang has probably not revised its preconditions, but one of the purposes of early direct talks would be to gauge each side's positions and demands.

The above recommendations for China do not address concerns regarding North Korea's nuclear safety and nuclear security, despite a realistic need for Pyongyang to learn and adopt international standards and best practices on these two fronts. While China and Russia would be best positioned to conduct outreach on these issues, it could be misperceived as legitimizing North Korea's nuclear weapons possession and program, which both countries have publicly opposed.

The above recommendations for both the United States and China also do not preclude the need for them to seek opportunities to work together on the North Korean nuclear issue, even if, at present, that may be a bridge too far. At the least, however, Washington and Beijing should discuss crisis and contingency scenarios—such as internal instability, humanitarian crisis, nuclear accident or miscalculated nuclear-use—in terms of what each side would do in situations that would require Chinese and US involvement. Both sides would need to be able to read each other's intentions to prevent any emergency or crisis inside North Korea from inadvertently escalating into a larger conflict between the big powers.

Holding such bilateral discussions are undoubtedly sensitive and politically risky, especially for China, because they could be misinterpreted by North Korea. Washington may, instead, need to convey its intentions to Beijing regarding such potential scenarios without expecting a two-way conversation on the topic.

5

US-China areas of cooperation: Nonproliferation and nuclear security

Miles A. Pomper and Sanjana Gogna

US-China cooperation on nonproliferation and nuclear security has been a bright spot in an increasingly dark power struggle between the two global giants and a looming civilian nuclear energy rivalry. The two countries have cooperated directly to reduce highly enriched uranium (HEU) stocks around the globe, build a Center of Excellence (CoE) for Nuclear Security in China, and cooperated publicly in efforts to advance diplomatic approaches to the risks posed by North Korea's and Iran's nuclear programs.

It is an open question to what degree these positive aspects can endure as China seeks to displace the United States from its leadership role in nuclear matters and the United States has come to identify China as its principal national security challenge, including concerns that Beijing has taken advantage of commercial nuclear trade to enhance its military capabilities. Amid these growing tensions, deepening or broadening such cooperation is likely to prove more challenging. While China seems eager to reinvigorate nuclear security cooperation as the world reopens after the global pandemic, US officials have been wary as they seek to sketch out their overall approach towards Beijing. As one nuclear diplomacy insider put it, "China is very interested in resuming a nuclear security dialogue, but when it comes to China, U.S. government policy has elements of confronting, competing, and cooperation, and it is not clear where nuclear security fits in."¹

Still, cooperation between Washington and Beijing on these issues is essential, even amid growing bilateral bitterness. China's dominance of global nuclear power plant construction and perhaps even larger role in the future means that Beijing will have an outsized impact on global nuclear safety, security, and nonproliferation in coming years. Meanwhile, US institutions such as the Nuclear Regulatory Commission, and US export control and nuclear cooperation agreements have long been global standard-setters. Beijing and Washington should recognize that they have shared interests in preventing other countries and non-state actors from threatening their security and foreign policy interests

that this requires them to continue and expand cooperation in this area.

Background

Nuclear power is fast becoming an important part of Beijing's grand strategy. China began developing nuclear power plants only in the 1990s—three decades after Western powers. Yet, it has since emerged as a frontrunner in several aspects of nuclear energy. With 54 operational nuclear reactors, it has the world's second-largest nuclear reactor fleet. China has a combined net nuclear capacity of 50.8 GWe and in 2020, nuclear energy constituted 4.9% of its electricity share. China also has 14 reactors under construction, far outpacing other countries. In its Five-Year Plan released in March 2021, China envisaged that its total nuclear capacity would rise to 70 gigawatts (GW) by the end of 2025.²

To reduce dependence on imported technology, China is building a domestic nuclear energy industry. It has shifted from importing reactors from foreign vendors, such as the US firm Westinghouse, which provided it with the AP1000 technology, to operating its homegrown third-generation reactor design the Hualong One in its Fujian province and in Pakistan. As of September 2020, a total of 12 Hualong One nuclear reactor in China were either under construction or going through the approval process.

China also recently achieved a major technological feat with its fourth generation high-temperature gas reactor—pebble bed reactor achieving criticality in its Shandong Province in September 2021.³ These reactors have their core formed from graphite pebbles that contain specially designed fuel particles that allow them to run safely at higher temperatures. Nearly all the equipment for the reactor is sourced domestically.⁴

China has now prioritized exporting nuclear power technologies; it is being pursued as one of the country's 16 key national science & technology projects. Chinese-built nuclear power plants could be an important part of its Belt and Road Initiative (BRI) in the next few years. The former chairman of China

¹ Video Interview with author, May 26, 2022.

² "China Should Speed Nuclear Development to Meet Carbon Goals - Industry Legislators," *Reuters*, last modified March 8, 2021, <https://www.reuters.com/business/environment/china-should-speed-nuclear-development-meet-carbon-goals-industry-legislators-2021-03-08/>

³ "World's First Nuclear Power Plant Using 4th Generation High-temperature Gas Reactor Officially Enters Operation in E China's Shandong,"

Global Times, last modified 0322, <https://www.globaltimes.cn/page/202112/1242878.shtml>

⁴ "China Puts Pioneering 'pebble Bed' Nuclear Reactor into Operation," *Reuters*, last modified December 20, 2021, <https://www.reuters.com/markets/commodities/china-puts-pioneering-pebble-bed-nuclear-reactor-into-operation-2021-12-20/>

National Nuclear Corp predicted that China could build 30 reactors abroad through BRI by 2030.⁵ In February 2022, China signed a deal with Argentina to build the Atucha III nuclear power plant using Hualong One technology after the country agreed to join BRI.⁶

China is also taking a leadership role in providing training in nuclear security. The International Atomic Energy Agency (IAEA) has set up its first Nuclear Energy Management School in China with the cooperation of China's Nuclear Industry College. It focuses on building leadership skills for supporting nuclear energy development in countries that have recently started nuclear power programs.⁷

As China expands its nuclear power infrastructure and leads in this area, the United States has grown concerned about Chinese trade and industrial espionage to steal US technology secrets. In 2015, a US government Nuclear Proliferation Assessment Statement submitted to Congress raised concerns regarding a 2007 technology transfer agreement by which the United States helped China build AP1000 reactors. It pointed towards the potential use of the unique sealed pumps of the Westinghouse AP1000 reactor for the Chinese naval reactor program.⁸ Further, following a National Security Council-led review of the previous US policy regarding civil nuclear cooperation with China, the administration of Donald Trump took several initiatives to curb China's efforts to acquire US intellectual property and advanced technology.⁹

Given its concerns that Beijing is using US nuclear technology to improve its military capabilities, the

United States has imposed new export controls on China to ensure that US exports to China are put to military end-uses. Subsequently, however, the previously robust bilateral export control dialogue has been limited. China has attempted in the United Nations General Assembly and elsewhere to build international opposition to US export controls. Moreover, as Beijing's relations with the United States sour, questions emerge on their current and the future scope of cooperation in nuclear security.

Past successes

China did not join the Nuclear Nonproliferation Treaty (NPT) until March 1992, decades after it first tested nuclear weapons and the treaty entered into force. Still, consistent US-Chinese engagements

“Given its concerns that Beijing is using US nuclear technology to improve its military capabilities, the United States has imposed new export controls on China to ensure that US exports to China are put to military end-uses.”

through the 1990s led Beijing to take some positive steps towards nuclear security, albeit at a slow pace and in a limited fashion. To wit, Beijing formalized its national export control system, although there remain several loopholes in its laws. China also ceased

transferring sensitive nuclear technologies to Iran, even though some controversial transfers have continued. Lastly, China's applied to join—and was accepted in—the Nuclear Suppliers Group (NSG).

China became serious about nuclear security in the lead-up to the 2008 Beijing Olympics. Its cooperation with the United States in nuclear security began to deepen following an industry meeting in 2009, where US and Chinese officials agreed to partner in

⁵ “China Could Build 30 ‘Belt and Road’ Nuclear Reactors by 2030: Official,” *Reuters*, last modified June 20, 2019, <https://www.reuters.com/article/us-china-nuclearpower-idUSKCN1TL0HZ>

⁶ “After Pakistan, China to Build Nuclear Power Plant in Argentina,” *WION*, last modified February 14, 2022, <https://www.wionews.com/world/after-pakistan-china-to-build-nuclear-power-plant-in-argentina-453096>

⁷ “IAEA and China Focus on the Future in First Nuclear Energy Management School in China,” International Atomic Energy Agency, accessed May 30, 2022, <https://www.iaea.org/newscenter/news/iaea-and-china-focus-on-the-future-in-first-nuclear-energy-management-school-in-china>

⁸ Paul K. Kerr, Mary Beth D. Nikitin, “New U.S. Policy Regarding Nuclear Exports to China,” Congressional Research Service, last modified December 17, 2018, <https://sgp.fas.org/crs/nuke/IF11050.pdf>

⁹ More recently, in August 2019, the US Department of Commerce placed China General Nuclear Power Group (CGN)—Beijing's largest state-owned nuclear company—and three of its subsidiaries on the “entity list” for being allegedly “engaged in or enabled efforts to acquire advanced U.S. nuclear technology and material for diversion to military uses in China.” In November 2021, the US Nuclear Regulatory Commission (NRC) suspended the trade of radioactive materials with CGN.

¹⁰ Miles Pomper and Ferenc Dalnoki-Veress, “The Little Known Success Story of US-China Nuclear Security Cooperation,” Nuclear Threat Initiative, last modified June 10, 2020, <https://www.nti.org/analysis/articles/little-known-success-story-us-china-nuclear-security-cooperation/>

converting Chinese-origin Miniature Neutron Source Reactors (MNSRs) from using nuclear weapons-grade highly enriched uranium fuel to low-enriched uranium (LEU). These conversions aim to reduce the likelihood of nuclear proliferation and nuclear terrorism, given that using HEU is the fissile material deemed as the easiest and surest path to building a nuclear weapon; the atomic bomb the United States dropped on Hiroshima used HEU and had not been tested prior to its wartime use. The US Argonne National Laboratory and the China Institute of Atomic Energy completed the conversion of MNSRs in Nigeria and Ghana in 2018 and 2017, respectively. Teams from both sides also carried out detailed technical studies to ensure the maintenance of performance and safety standards post-conversion. Discussions of conversions of reactors in Iran, Pakistan, and Syria, and one at Shenzhen University in China are underway.¹⁰

China made several commitments with regard to combating nuclear terrorism at the four Nuclear Security Summits (NSSs) led by US President Barack Obama in 2010-2016. One of the successful outcomes was the joint establishment of the CoE in China by the US and Chinese governments. The CoE became operational in 2015 and serves as a forum for bilateral and regional best practice exchanges. It is also the venue for China's domestic nuclear security training requirements and for demonstrating advanced technologies related to nuclear security.^{11 12} The National Nuclear Security Administration (NNSA) has collaborated with the China Atomic Energy Authority and the State Nuclear Science and Technology Center on nuclear security via the CoE, in training development and delivery on physical security, response, material accounting and control, cybersecurity, transport security, and sustainability.¹³ The CoE also works with Pacific Northwest National Laboratory, where the latter advises on the physical

protection curriculum and instructs the Chinese CoE instructors.¹⁴ The pace of collaboration, however, has slowed since US-China relations began to sour in the last 2010s.

At the 2014 NSS, China joined the gift basket on "strengthening nuclear security implementation" and at the final NSS in 2016, it joined six "gift baskets" and agreed to coordinate in strengthening countering nuclear smuggling capabilities. These gift baskets were the joint commitments that groups of countries took in specific areas of nuclear security. Some of these commitments were later circulated beyond NSS participants and opened up to all IAEA members in the form of information circulars (INFCIRCs); for example, the "Strengthening Nuclear Security Implementation" gift basket was circulated as INFCIRC 869.¹⁵ During the final summit, the United States and China also issued a joint statement in which they promised to hold an annual dialogue on nuclear security to discuss and strengthen nuclear security cooperation.¹⁶ These official annual dialogues stopped in 2018, but Track-1.5 interactions that mirror the official dialogues continue.

The two giants have also cooperated in trying to limit and ultimately denuclearize North Korea's nuclear weapons program and prevent Iran from developing nuclear weapons. Together with the rest of the permanent members of the United Nations Security Council plus Germany and the European Union, they achieved initial success on the Iranian nuclear issue by reaching the Joint Comprehensive Plan of Action (JCPOA) agreement on July 14, 2015. The agreement sought to eliminate Iran's stockpile of medium-enriched uranium, cut its stockpile of LEU by 98%, and reduce by about two-thirds the number of its gas centrifuges for 13 years. As a part of the JCPOA, Iran also agreed to convert its Arak heavy water reactor—which originally runs on natural uranium

¹⁰ Miles Pomper and Ferenc Dalnoki-Veress, "The Little Known Success Story of US-China Nuclear Security Cooperation," Nuclear Threat Initiative, last modified June 10, 2020, <https://www.nti.org/analysis/articles/little-known-success-story-us-china-nuclear-security-cooperation/>

¹¹ "U.S.-China Joint Statement on Nuclear Security Cooperation," The White House President Barack Obama, last modified March 31, 2016, <https://obamawhitehouse.archives.gov/the-press-office/2016/03/31/us-china-joint-statement-nuclear-security-cooperation>.

¹² "U.S.-China Joint Statement on Nuclear Security Cooperation," The White House President Barack Obama, last modified March 31, 2016, <https://obamawhitehouse.archives.gov/the-press-office/2016/03/31/us-china-joint-statement-nuclear-security-cooperation>.

¹³ "China's Nuclear Security Technology Centre Supports International Training Efforts," International Atomic Energy Agency, last modified May 30, 2022, <https://www.iaea.org/bulletin/chinas-nuclear-security-technology-centre-supports-international-training-efforts>.

¹⁴ Authors' interview with NNSA.

¹⁵ Authors' interview with NNSA.

¹⁶ Alina Constantin, Andrew Newman, and Thomas Isaacs, "Nuclear Security Centers of Excellence in Asia: Opportunities for Collaboration," Nuclear Threat Initiative, last modified August 2017, https://media.nti.org/documents/NTI_Centers_of_Excellence_in_Asia_Background_Paper_Aug2017.pdf

¹⁷ "What Are Nuclear Security INFCIRCS?" Nuclear Threat Initiative, last modified July 20, 2020, <https://www.ntiindex.org/story/what-are-nuclear-security-infcircs/>

¹⁸ "China Makes Significant Nuclear Security Pledges at 2016 Summit," Belfer Center for Science and International Affairs, last modified April 8, 2016, <https://www.belfercenter.org/publication/china-makes-significant-nuclear-security-pledges-2016-summit>

and generate plutonium in its spent fuel—to run on low-enriched fuel that would produce only traces of plutonium. Both the United States and China set up a working group to design a new reactor, but the progress in the conversion of the Arak reactors stalled due to lengthy negotiations between Iran and China and then the US withdrawal from the JCPOA.¹⁷ The North Korea issue is discussed in Chapter 4.

Ongoing challenges

The two sides have not been able to resolve their differences on some critical issues concerning the nonproliferation regime. The United States has often expressed concerns regarding loopholes in China's export control system and sanctioned several Chinese companies over the years. For these reasons, the United States has blocked China's membership in the Missile Technology Control Regime (MTCR), a group of 35 countries that have an informal political understanding to limit the proliferation of missiles and missile technology. China has supplied MTCR-restricted missiles, components, and technologies to Pakistan, Iran, Saudi Arabia, and Syria.¹⁸ Even as China, from time to time, has declared its adherence to MTCR guidelines and has engaged with the regime, the United States has raised issues with China's alleged missile transfers and issued sanctions to force Beijing follow MTCR guidelines.

In a speech in November 2020, then US Deputy Assistant Secretary of State Alex Wong argued that China "hosts no less than two dozen North Korean WMD and ballistic missile procurement representatives and bank representatives" and that the United States had "provided China with ample actionable information on the ongoing UN-prohibited activities occurring within its borders," yet Beijing "has chosen not to act". On November 25, 2020, the State Department sanctioned two Chinese entities for transferring sensitive technology and items to Iran's missile program.

Their intensifying geopolitical competition has also manifested in the deadlock on several matters

concerning the NSG, which governs the transfers of civilian nuclear material and nuclear-related equipment and technology. One of the main issues relates to China's construction of the Chashma nuclear reactors in Pakistan. China had signed the deal to construct six nuclear reactors in Pakistan. However, when China joined the NSG in 2004, the first four were already constructed, and Beijing informed NSG member states that it would not supply any further reactors to Pakistan. However, later China decided to "grandfather" the remaining two reactors, prompting the United States to argue that the construction of additional reactors contravenes the NSG guidelines that prohibit transfers to states such as Pakistan that do not adopt full-scope IAEA safeguards agreements.¹⁹

China, meanwhile, has opposed the US support for India's membership to the NSG following the signing of the US-India civil nuclear cooperation agreement in 2006 on the grounds that New Delhi is not a member of the NPT. The China-Pakistan deal is often seen as a reaction to the US-India agreement and deepening defense cooperation ties between Washington and New Delhi.²⁰ Strengthened ties with Pakistan allows China to balance the Indian and US geo-strategic positioning in the region.

New areas for discussion

As China plays a greater role in nuclear power, consistent engagement between the two countries would be crucial to enhance global nuclear security. There are several potential areas where the two countries can cooperate.

Making the IAEA Additional Protocol a condition of supply for third country exports

The United States, Japan, and South Korea insist that customers agree to an Additional Protocol to their safeguards agreement with the IAEA because it provides the Agency with greater inspection authority. As China becomes a nuclear exporter and

¹⁷ Richard Stone, "U.S. move imperils effort to reduce weapons risk from Iranian reactor: Trump administration will no longer waive sanctions for project," *Science*, last modified May 30, 2022, <https://www.science.org/content/article/us-move-imperils-effort-reduce-weapons-risk-iranian-reactor?cookieSet=1>

¹⁸ Kolja Brockmann "The Missile Technology Control Regime at a Crossroads," Stockholm International Peace Research Institute, last modified Oct 1, 2021, <https://www.sipri.org/commentary/topical-background/2021/missile-technology-control-regime-crossroads>

¹⁹ "Chinese Nuclear and Missile Proliferation," Congressional Research Services, last modified May 17, 2021, <https://crsreports.congress.gov/product/pdf/IF/IF11737#:~:text=The%20United%20States%20has%20extensive,cooperation%20agreement%2C%20renewed%20in%202015.&text=China%20is%20also%20a%20participant,regime%20for%20nuclear-related%20exports>

²⁰ Sharad Joshi, "The China-Pakistan Nuclear Deal: A Realpolitique Fait Accompli," Nuclear Threat Initiative, last modified December 10, 2011, <https://www.nti.org/analysis/articles/china-pakistan-nuclear-deal-realpolitique-fait-accompli-1/>

contemplates sales to countries such as Saudi Arabia, Beijing could agree to follow a similar policy.

Improving radiological security in Southeast Asia

The NNSA has cooperated successfully with China's Ministry of Ecology and Environment to conduct training for inspectors in China on physical protection, packaging, and transport of high-activity radioactive sources. Discussions between the two sides are underway to conduct bilateral technical exchanges on electron beam and other industrial irradiation technology.²¹ There is an opportunity for the two sides to cooperate in radiological security, particularly in Southeast Asia, where radioactive materials are widely used for peaceful applications in areas such as health and medicine, agriculture, and soil and water management. Several ASEAN member-states have not signed and ratified key global nuclear agreements, such as the nuclear security treaties and the Code of Conduct on the Safety and Security of Radioactive Sources. They also have not implemented appropriate domestic regulations, nor have they sought means to substitute non-isotopic materials where technically and economically feasible. Without such agreements, regulations, and practices, there is substantial risk of unauthorized use of such material in criminal or terrorist activities.

Improving cancer treatment and reducing radiological security risks in low-and middle-income countries

Linear accelerators (LINACs) do not use radioactive material and provide better cancer treatment than Cobalt-60 radiation treatment machines. Yet Cobalt-60 machines are still used in some developing countries because they are less expensive, are less prone to interruption in challenging environments, and require fewer skilled staff.²² China recently developed inexpensive LINACs for export and both China and the United States have an interest in substituting such technology for Cobalt-60s where possible and fully training and mentoring local staff to use such equipment. Joint US-China commitments to providing LINACs would allow them both to meet

some of their "peaceful use" commitments under Article IV of the NPT.

Enhancing the safety of nuclear power plants in war zones

The Russian invasion of Ukraine has shown that the IAEA and the international community need to address the risk of radiological release that comes with siting nuclear power plants in potential war zones, and the lack of international conventions regarding threats to an operation and occupation of such plants. As tensions between China and the United States rise, so do the risks to nuclear power plants in Taiwan, China, South Korea, and Japan, many of which lie in coastal areas that could come under fire from the two countries navies and air forces. As a result, the two countries share an interest in developing international standards in this area and could work together at the IAEA to lead such discussion, building from IAEA Director General Rafael Grossi's invocation of "seven pillars of nuclear safety and security" in the Ukraine crisis.²³ Currently, there are no existing treaties that deal specifically with nuclear power plants and their fuel storage. However, the two sides could consider work to put in place stronger legal measures and find out ways to enforce such measures.²⁴

Contingency plans for North Korea

Should the North Korean regime collapse, the United States and China would share an interest that there are no "loose nukes" or other material for weapons of mass destruction (WMD) and related delivery systems and that the North Korean arsenal and relevant facilities and materials are secured. Both also have nearby military forces that would likely be charged with such a mission in the event of a regime breakdown. Short of that, extensive secrecy about the North Korean nuclear programs and a lack of IAEA safeguards oversight also puts the North Korean population and those of neighboring states (including China's) at serious risk in case of a major nuclear accident. China and the United States, then, could work together to devise a WMD contingency plan.

²¹ Authors' interview with NNSA.

²² Miles A. Pomper, Ferenc Dalnoki-Veress, and George M. Moore, "Treatment, Not Terror," Stanley Center for Peace and Security, last modified December 23, 2019, <https://stanleycenter.org/publications/treatment-not-terror/>

²³ "IAEA Director General Grossi's Initiative to Travel to Ukraine," International Atomic Energy Agency | Atoms for Peace and Development,

accessed May 30, 2022, <https://www.iaea.org/newscenter/pressreleases/iaea-director-general-grossi-initiative-to-travel-to-ukraine>

²⁴ George M. Moore, "How International Law Applies to Attacks on Nuclear and Associated Facilities in Ukraine," *Bulletin of the Atomic Scientists*, last modified March 8, 2022, <https://thebulletin.org/2022/03/how-international-law-applies-to-attacks-on-nuclear-and-associated-facilities-in-ukraine/>

Bilateral testing moratoria

The two could make a bilateral pledge to continue observing their testing moratoria in the absence of the Comprehensive Nuclear-Test-Ban Treaty's (CTBT) entry into force and that if one ratifies the other one will as well. They could also call on other non-signatory states possessing nuclear weapons, namely India, Israel, and Pakistan, to join the pledge.

However, one challenge facing the CTBT is the lack of clarity over the concept of "zero yield."²⁵ While the term is not mentioned in the CTBT text, the US Department of State has used it to differentiate between supercritical hydronuclear tests (which produce a self-sustaining fission chain reaction) that are banned, and subcritical hydrodynamic experiments, which do not produce a self-sustaining fission chain reaction, and are permitted.²⁶ The US Department of State report titled "2020 Adherence to and Compliance with Arms Control, Non-proliferation, and Disarmament Agreements and Commitments" raised concerns regarding China's adherence to the "zero yield" standard as it claimed that China may have conducted low-level nuclear test blasts throughout 2019.

The United States and China, then, could agree to a shared understanding of what constitutes a "zero yield" that can allow them to build the confidence necessary for the bilateral pledge for testing moratoria. The two countries could also cooperate in other areas, such as carrying out simulations of potential on-site inspections that would be permitted once the treaty enters into force.

Reviving the process started at the NSS

The steady decline in US-China relations since 2016 has had a negative impact on their bilateral cooperation on nuclear security that began during the four iterations of the NSS. While some technical and working-level contacts continue, the senior-level mechanisms that oversee and steer cooperative engagement have come to a halt.²⁷

Both sides could re-initiate the annual bilateral dialogue, which has not taken place since 2019. Their engagements within the CoE also seems to have petered out over the years. Further, there has not been any further progress in the conversion of MSNRs. Dialogue could offer an opportunity to discuss the prospects of converting the reactors in Iran and Pakistan and review their commitments towards the gift baskets. China and the United States could also engage other regional CoEs in Asia, such as in South Korea and Japan, to further strengthen nuclear security. China has also shown interest in cooperating with the United States on the training nuclear power plants operators in dealing with crises such as the COVID-19 pandemic and on public engagement or a variety of nuclear power issues.

The Chinese side has expressed interest in resuming dialogue and cooperation on these issues, including on nuclear security regulations. However, factors such as the ongoing pandemic, movement of the bureaucrats to other offices, and shift of focus toward other issues has caused the United States to put cooperation with China on a backburner.

A challenge to future cooperation on achieving NSS goals is the continued suspicion within the United States about China's misuse of its civil nuclear program for military use.

Reviving the export control dialogue

In October 2020, China passed an Export Control Law that implements regulations and updates its control lists to include dual-use and nuclear items, among others. Many see it as a countermeasure to the US use of its export control authorities to restrict the transfer of dual-use technology to China; as noted above, the United States has strengthened its export control authorities to tighten China's access to sensitive technologies. There are suspicions that China may use its export control laws in retaliation against the United States and use them to impose temporary export controls on items not on a control list.²⁸ Potential exists, then, for the two sides to work on strengthening a universal and non-discriminatory export control regime.

²⁵ Sanjana Gogna, "The CTBT and the Possible U.S., China Nuclear Testing," CAPS India, last modified June 16, 2020, <https://capsindia.org/wp-content/uploads/2021/10/bf12fd5e-66d4-4a91-8cfc-a94b1dfef235.pdf>

²⁶ Bureau of Arms Control, Verification, and Compliance. "Scope of the Comprehensive Nuclear Test-Ban Treaty," U.S. Department of State (2013). <https://2009-2017.state.gov/t/avc/rls/212166.htm>

²⁷ Robert Einhorn, "Revitalizing Nonproliferation Cooperation with Russia and China," Brookings, last modified January 25, 2021, <https://www.brookings.edu/research/revitalizing-nonproliferation-cooperation-with-russia-and-china/>

²⁸ Karen M. Sutter, "China Issues New Export Control Law and Related Policies," Congressional Research Service (CRS), last modified October 26, 2020, <https://sgp.fas.org/crs/row/IN11524.pdf>

Additionally, as new technologies emerge, there are disputes and uncertainties regarding the sales of unmanned aerial vehicles (UAV), commonly known as drones, within the export control regimes. Still, China has been exporting MTCR-violating drones, so engaging China within the purview of the MTCR, even though it is not a member, would be a crucial to address the upcoming challenges in export controls.²⁹

Establishing nuclear-weapon free zones

The NPT Review Conference process opens opportunities for the two sides to work together on issues that come under the treaty's purview, such as the establishment of a nuclear-weapons-free zone in the Middle East. Yet the 2021 security pact between Australia, the United Kingdom, and the United States (AUKUS), which allows Canberra to receive technology and fissile material for a nuclear-powered submarine program from London and Washington, could complicate such cooperation. Australia is expected to exercise IAEA safeguards exemption for the submarine program from routine monitoring on the grounds that the program is for military purposes.³⁰ China, for its part, has argued that the pact violates the norms of comprehensive safeguards agreements and causes problems for the New Strategic Arms Reduction Treaty and the establishment of nuclear-weapon-free zones.³¹

Still, in November 2021, China expressed its readiness to sign the protocol to the Southeast Asia nuclear weapon-free zone (SEANWFZ) Treaty as early as possible. However, there are concerns within the United States and amongst some US allies that SEANWFZ might restrict nuclear-weapon capable US vessels from freely navigating and making port calls in the region.³²

Reviving the Iran nuclear deal

The impact of deteriorating US-China relations is also visible in nonproliferation efforts concerning Iran.

The United States unilaterally withdrew from the JCPOA in May 2018 and subsequently re-imposed all its sanctions on Iran. Washington cited the deal's sunset provisions and its failure to account for Iran's ballistic missile program as the main reasons for its withdrawal. China has opposed US sanctions on Iran and called for their removal and an unconditional return to the JCPOA. During previous JCPOA negotiations, China had made the case for increased investment and economic assistance to Iran in return for its acceptance of the deal.³³

China has an interest in a stable Middle East and in a nuclear deal with Iran allowing trade without the threat of US sanctions. During the last virtual Track-1.5 dialogue with the United States, the Chinese side showed interest in resuming the conversion of the Arak reactors. However, during recent US efforts to resuscitate the deal, Beijing has been a passive participant, not blocking progress but also not spurring it.

In March 2021, China and Iran signed a 25-year comprehensive cooperation agreement covering economic, military, and security areas.³⁴ China has also purchased energy from Iran and has shown interest in investments in Iran. There are concerns that the revenue from the Chinese investments would lead Iran to build missiles and advance its nuclear weapons program. Getting China onboard on any future agreement with Tehran would involve Beijing balancing its traditional posture in the Middle East with maintaining its energy relations with Iran and Saudi Arabia.

Containing missile proliferation in the Middle East

Several Middle Eastern countries possess ballistic missile systems. Six Middle Eastern countries, namely Turkey, the United Arab Emirates, Iran, Israel, Egypt, and Saudi Arabia also maintain cruise missiles. Iran's ballistic missile program is destabilizing for the region; Tehran has used it to

²⁹ Samuel M. Hickey, "How to Jumpstart a Dialogue With China on Arms Control," *The Diplomat*, last modified December 3, 2021, <https://thediplomat.com/2021/12/how-to-jumpstart-a-dialogue-with-china-on-arms-control/>

³⁰ Toby Dalton, "How the United States Can Use AUKUS to Strengthen Nuclear Nonproliferation," Carnegie Endowment for International Peace, last modified December 16, 2021, <https://carnegieendowment.org/2021/12/16/how-united-states-can-use-aukus-to-strengthen-nuclear-nonproliferation-pub-86024>

³¹ "AUKUS Deal Endangers International Security Order: Chinese, Russian Representatives," *Xinhua*, accessed May 30, 2022, https://news.cn/english/2021-11/27/c_1310337373.htm

³² Christine Parthemore, "The Southeast Asia Nuclear-Weapon-Free Zone: A US Perspective on the Treaty and Its Future," Asia-Pacific Leadership Network, last modified February 2017, <https://cms.apln.network/wp-content/uploads/2020/12/Policy-Brief-No-33-The-Southeast-Asia-Nuclear-Weapon-Free-Zone-A-US-Perspective-on-the-Treaty-and-Its-Future.pdf>

³³ "China Slams American Sanctions on Iran," *Al Jazeera*, last modified January 15, 2022, <https://www.aljazeera.com/news/2022/1/15/china-reaffirms-opposition-to-u-s-sanctions-on-iran>

³⁴ Maziar Motamedi, "Iran Says 25-year China Agreement Enters Implementation Stage," *Al Jazeera*, last modified January 15, 2022, <https://www.aljazeera.com/news/2022/1/15/iran-says-25-year-china-agreement-enters-implementation-stage>

target Syria twice. Iranian proxies in Yemen have fired ballistic missiles at Saudi Arabia as well. Iran has kept missiles and drones out of JCPOA negotiations as they constitute its main source of deterrence; it was, as mentioned, one of the main issues that led the Trump administration to abandon the JCPOA.

Still, Iran may be open to agreeing to certain limitations if it requires reciprocal efforts by other regional actors. Missile proliferation is a serious issue in the region and would require a region-wide solution. Several Middle Eastern countries have publicly stated that they would be interested in a missile limitation agreement. The United States and China can facilitate dialogues between regional states and help them formulate limitations on the testing, development, deployment, transfer, or sale of missiles.³⁵

Keeping Saudi Arabia's nuclear weapons program in check

Although Saudi Arabia does not possess WMD, its officials have hinted at the desirability of possessing nuclear weapons to counter the nuclear ambitions of Iran. So far, Riyadh possesses intermediate-range ballistic missiles purchased from China, and it can manufacture ballistic missiles indigenously as of 2021. Riyadh has also received missile defense supplies from the United States.³⁶ Given China's involvement with Riyadh's intercontinental ballistic missile program and US assistance in missile defense and more generally, both countries could cooperate and use their leverage to steer Saudi Arabia away from its nuclear weapons ambitions. In his recent book, Vipin Narang highlights the risk that Saudi Arabia, like Pakistan before it, could use "a sheltered pursuit" strategy to obtain nuclear weapons, i.e., use its relationships with the United States and China to move from a hedging strategy to a more open pursuit of nuclear weapons, with the two global powers shielding it from punishment for violating nonproliferation norms and agreements.³⁷

Tightening cooperation in ad hoc nuclear security and nonproliferation initiatives

The Global Initiative to Combat Nuclear Terrorism was launched in 2006 by Russia and the United States to prevent acts of nuclear terrorism. Three years earlier, in 2003, the United States led the efforts to launch the Proliferation Security Initiative (PSI), a voluntary initiative to "disrupt and interdict WMD-related materials, technologies, and means of delivery in transit."³⁸ China and the United States could lead efforts on preventive actions pertaining to cyber threats or insider threat mitigation.³⁹ There is also a possibility for China to begin participating in the PSI and within its purview communicate about recent activities, interdictions, and other relevant information.⁴⁰

Conclusions

US-China cooperation on nonproliferation and nuclear security can still be a bright spot as relations between Washington and Beijing continue to grow tense. It seems that China is willing to engage the United States in such areas and reconvene the Track-1 dialogues. The US interest, however, seems to have dampened. While other elements of the relationship may require confrontation or competition, nonproliferation and nuclear security are, in theory, areas where cooperation is in both US and Chinese national interests.

The current US administration has not indicated interest in restarting the dialogue. However, engagement by the United States would be necessary as China expands its nuclear power and begins to have a greater impact on global nuclear safety, security, and nonproliferation. Even as the United States continues to have suspicions with regards to China's use of nuclear power technologies for military purpose and proliferation, a strengthened cooperation on nonproliferation and nuclear security would help address some current and emerging challenges, plus build trust between the two sides.

³⁵ "Ballistic Missiles and Middle East Security: An Alternative Approach," The Iran Project and the European Leadership Network, last modified January 2022, <https://www.europeanleadershipnetwork.org/wp-content/uploads/2022/01/27012022-IP-ELN-BM-Report-Final.pdf>

³⁶ "U.S. to resupply Saudi and UAE missile defense systems," Reuters, last modified August 2, 2022, <https://www.reuters.com/world/middle-east/us-oks-potential-sale-thaad-system-missiles-uae-pentagon-2022-08-02/>

³⁷ Vipin Narang, *Seeking the Bomb: Strategies of Nuclear Proliferation*, (Princeton: Princeton University Press, 2022), pp. 304-305

³⁸ "Proliferation Security Initiative," Arms Control Association, accessed June 6, 2022, <https://www.armscontrol.org/specialprojects/nnpm/PSI>

³⁹ "The Global Initiative to Combat Nuclear Terrorism," Arms Control Association, accessed June 6, 2022, <https://www.armscontrol.org/specialprojects/nnpm/GICNT>

⁴⁰ "Proliferation Security Initiative," Arms Control Association.

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