

ISSUE BRIEF

# Arms Racing Under Nuclear Tripolarity: Evidence for an Action-Reaction Cycle?

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## EXECUTIVE SUMMARY

Are the United States, Russia, and China in or on the cusp of a three-way nuclear arms race? With China's ongoing nuclear expansion, questions of nuclear strategy—such as nuclear arms racing—must be reassessed under new, three-way dynamics. Some international relations theories predict that an arms buildup in one state will cause a reciprocal buildup in others, leading to a spiral of tightly coupled actions and reactions. In contrast to this theory, nuclear weapons developments in the United States, Russia, and China since the Cold War have largely not been motivated by nuclear arms building in the other states. Theater nuclear weapons may be a limited exception to this finding. Yet with China's plan to expand its nuclear arsenal to at least one thousand warheads by the end of this decade, there is a risk of a strategic nuclear arms race. To maintain its nuclear strategy, the United States will likely need to expand its nuclear forces in the coming years.<sup>1</sup> Russia and China's response to this expansion will determine whether a nuclear arms race takes place. This spiral is not a foregone conclusion, especially since China does not have a history of pursuing nuclear parity. Even if a nuclear arms race does emerge, however, the United States would be better off dealing with its consequences than accepting the risks of deterrence failure. This is the first in a series that the Atlantic Council will publish in 2022 and 2023 on tripolar nuclear dynamics.

<sup>1</sup> For more on strategic weapons force-sizing under the conditions of nuclear tripolarity, see Matthew Kroenig and Mark J. Massa, "Nuclear Force Sizing under Tripolarity," Atlantic Council, forthcoming.



An Air Force Global Strike Command unarmed Minuteman III Intercontinental Ballistic Missile launches during an operational test at 1:13 A.M. PDT, Sept. 7 at Vandenberg Space Force Base, Calif. More than fifty years old, the Minuteman III is one of the nuclear capabilities being replaced by US nuclear modernization. US Air Force photo by Airman 1st Class Ryan Quijas, <https://www.spoc.spaceforce.mil/Multimedia/Photos/igphoto/2003071967>.

## BACKGROUND

Conventional wisdom suggests that the world may enter a new tripolar arms race among the United States, Russia, and China.<sup>2</sup> The United States is modernizing its nuclear triad and its supporting nuclear command, control, and communications (NC3). Russia has modernized its strategic nuclear forces since the mid-2000s. It has also built nonstrategic and “exotic” nuclear weapons, many of which are not covered by the New START arms control treaty.<sup>3</sup> Simultaneously, China is expanding its number of nuclear warheads, and the US Department of

Defense (DoD) recently estimated that China will quintuple the size of its arsenal to at least one thousand deliverable nuclear warheads by 2030.

This is an unprecedented problem for the United States, as it will likely soon face two peer or near-peer nuclear superpowers. As Admiral Charles A. Richard, commander of US Strategic Command, has stated, “[t]he strategic security environment is now a three-party nuclear near peer reality.”<sup>4</sup> This development raises a range of questions about deterrence under the condition of nuclear tripolarity. Issues of tripolar arms races and

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- 2 Benjamin Zala, “How the next nuclear arms race will be different from the last one,” *Bulletin of the Atomic Scientists*, January 2, 2019, <https://thebulletin.org/2019/01/how-the-next-nuclear-arms-race-will-be-different-from-the-last-one/>; David A. Cooper, *Arms Control for the Third Nuclear Age: Between Disarmament and Armageddon* (Washington, DC: Georgetown University Press, 2021); Luo Xi, A Looming Strategic Arms Race in the Asia-Pacific Region: From a Chinese Perspective, Asia-Pacific Leadership Network for Nuclear Non-Proliferation and Disarmament, October 2021, [https://cms.apln.network/wp-content/uploads/2021/10/Luo-Xi\\_Strategic-Arms-Race\\_APLN-Special-Report.pdf](https://cms.apln.network/wp-content/uploads/2021/10/Luo-Xi_Strategic-Arms-Race_APLN-Special-Report.pdf).
  - 3 Amy F. Woolf, *Russia’s Nuclear Weapons: Doctrine, Forces, and Modernization*, Congressional Research Service, updated September 13, 2021, <https://sgp.fas.org/crs/nuke/R45861.pdf>.
  - 4 “USSTRATCOM and USSPACECOM SASC Testimony,” United States Strategic Command, March 9, 2022, <https://www.stratcom.mil/Media/Speeches/Article/2960836/usstratcom-and-usspacecom-sasc-testimony/>.

the dynamics of escalation under tripolarity are novel. Scholars and experts are largely wrestling with these questions for the first time. Some have proposed that the world has entered a new nuclear age.<sup>5</sup> Of course, many journalistic reports suggest that the tripolar arms race has begun. It seems that anytime a new weapon system is being developed or announced, journalists throw around the term “arms race.”<sup>6</sup> This issue brief will address the possibility of tripolar nuclear arms races.

This issue brief will review the theory and the history of nuclear arms racing among the United States, Russia, and China. It will seek to assess two key questions: First, is the world in a tripolar nuclear arms race? Second, are we likely to enter a tripolar nuclear arms race in the future? This paper will argue that there is some evidence of action-reaction cycles among Washington, Beijing, and Moscow, but so far, the absence of nuclear arms racing has been most notable. Indeed, much of the nuclear posture decisions by these three powers to date has been driven by other factors. Therefore, there is some reason to worry about action-reaction arms races, but that worry has likely been overblown.

While there is certainly a good deal of conventional forces building in each of the three powers, this study focuses on the possibility of nuclear arms races. Further, it is likely that nuclear weapons building in these states motivates in part conventional arms buildups, and vice versa. However, this analysis responds to the emerging conventional wisdom that nuclear weapons building in each state is generating nuclear arms-racing pressure in the other two.

This issue brief will continue in three parts. First, it will review arms-racing theory. Second, it will look at recent nuclear arms-racing history and strategic posture decisions among the United States, Russia, and China. Third and finally, it will look ahead to the future.

## THEORY OF ACTION-REACTION ARMS RACING

The theory of arms racing is grounded in the spiral model as articulated by Robert Jervis, Charles Glaser, and others.<sup>7</sup> Essentially, this is the idea that countries are not inherently aggressive. Instead, their primary motivation is to survive in a dangerous international environment. As such, they need to build military forces to protect themselves. However, this simultaneously threatens other countries, which are also worried about their survival and the military buildup of a potential adversary. Consequently, they build their own weapons to protect themselves.

For example: State A is building up its military to shore up its defenses, with no hostile intent toward State B. State B, seeing the buildup in State A, starts to fear an attack and begins to reinforce its own forces. To State A, this appears to be vindication of its fears and reason for a further buildup. This cycle continues until an arms race emerges as a result of this security dilemma. According to this spiral model, this cycle of hostility is based on little more than countries wanting to protect themselves in a dangerous world.

If this is the way the world works, then arms races are to be avoided because they are costly, contribute to tensions, and—most importantly—do not advance the goals of either State A or State B. Countries should instead refrain from arms races, assure each other of their benign intentions, and negotiate arms control agreements.

However, there are many theoretical reasons to think that the world does not always work this way. The author’s recent book, *The Logic of American Nuclear Strategy*, outlines reasons why nuclear arms races of the kind predicted by the spiral model do not occur.<sup>8</sup>

5 See, for instance: Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Henry Holt, 2012).

6 David E. Sanger and William J. Broad, “As China Speeds Up Nuclear Arms Race, the U.S. Wants to Talk,” *New York Times*, November 28, 2021, <https://www.nytimes.com/2021/11/28/us/politics/china-nuclear-arms-race.html>; Steven Erlanger, “Are We Headed for Another Expensive Nuclear Arms Race? Could Be,” *New York Times*, August 8, 2019, <https://www.nytimes.com/2019/08/08/world/europe/arms-race-russia-china.html>; Henry Richard Maar III, “A new arms race beckons. History shows what could freeze it,” *Washington Post*, January 13, 2022, <https://www.washingtonpost.com/outlook/2022/01/13/new-arms-race-beckons-history-shows-what-could-freeze-it/>; Andreas Kluth, “In This Nuclear Arms Race, China’s Hypersonic Gliders Are a Wake-Up Call,” *Washington Post*, October 29, 2021, [https://www.washingtonpost.com/business/energy/in-this-nuclear-arms-race-chinas-hypersonicgliders-are-a-wake-up-call/2021/10/29/74226b50-3882-11ec-9662-399cfa75efee\\_story.html](https://www.washingtonpost.com/business/energy/in-this-nuclear-arms-race-chinas-hypersonicgliders-are-a-wake-up-call/2021/10/29/74226b50-3882-11ec-9662-399cfa75efee_story.html); Thomas Grove, “Putin Threatens Arms Race as U.S. Prepares to Exit Nuclear Treaty,” *Wall Street Journal*, December 5, 2018, <https://www.wsj.com/articles/putin-threatens-arms-race-as-u-s-prepares-to-exit-nuclear-treaty-1544012990>.

7 Robert Jervis, *Perception and Misperception in International Politics* (Princeton, NJ: Princeton University Press, 1976); Charles L. Glaser, “The Political Consequences of Military Strategy: Expanding and Refining the Spiral and Deterrence Models,” *World Politics* 44, No. 4 (July 1992), 497–538.

8 Matthew Kroenig, *The Logic of American Nuclear Strategy: Why Strategic Superiority Matters* (New York: Oxford University Press, 2018).

What are the reasons why arms races do not occur? The first reason is that states' strategies are not always compatible with the spiral model. The spiral model assumes that countries seek security from attack through parity in military capabilities—in the nuclear context, matching their adversaries, warhead for warhead. However, the empirical evidence does not match this theoretical explanation. China, for instance, was content with a minimal or “lean and effective” deterrent for many decades, despite the build-up in the Soviet Union and the United States. In another example, the United States today faces a nonstrategic warhead deficit with Russia yet does not try to match Russia warhead-for-warhead when it comes to nonstrategic nuclear weapons.

The second reason that action-reaction arms races often do not occur is financial. Countries simply cannot afford to compete because they lack the financial or organizational capacity. France and North Korea are two examples of countries that decided not to match their respective rivals on a war-head-for-warhead basis, largely for economic reasons. In the Cold War, France decided on a policy of “strict sufficiency.” Cold War France did not seek to match the Soviet Union in the size of its nuclear arsenal.<sup>9</sup> Rather, it sought to maintain a nuclear force capable of deterring a Soviet attack on France. Similarly, North Korea's leaders today know that they cannot build a nuclear arsenal to match the United States; there are financial constraints on their ability to participate in an arms race.

Third, states have organizational or bureaucratic constraints on their ability to participate in arms races. One key example of this is China's significant historical difficulty in fielding a true nuclear triad. China's air- and sea-based legs are generally incapable of delivering nuclear weapons to the contiguous United States.<sup>10</sup> The Chinese Communist Party insists on centralized command and control of its military, especially its nuclear warheads, which are generally stored in centralized depots.<sup>11</sup> China does not trust its sailors to

go to sea with nuclear weapons aboard China's ballistic missile submarines.<sup>12</sup> While there is a political logic to this, it undermines Beijing's ability to match the capabilities of Washington or Moscow.

A final reason why action-reaction arms races do not often occur is that countries might build up their arsenals for other reasons. In the Cold War, Harold Brown, US Secretary of Defense to President Jimmy Carter, opined that, “Soviet spending has shown no response to U.S. restraint — when we build, they build; when we cut, they build.”<sup>13</sup> There are many reasons why a country might build up its arsenal, whether or not its adversary does the same. This could be for internal, bureaucratic reasons or because that state desires a larger nuclear force for other military or political reasons.

These explanations are not mutually exclusive; more than one of the four can be present at the same time.



The H-6 bomber is the main element of the air leg of China's nascent nuclear triad. It is not capable of reaching the contiguous United States. Courtesy Ministry of Defense of Japan. [http://www.mod.go.jp/js/Press/press2015/press\\_pdf/p20151127\\_02.pdf/](http://www.mod.go.jp/js/Press/press2015/press_pdf/p20151127_02.pdf/)

9 Claire Mills, “The French Nuclear Deterrent,” House of Commons Library, November 20, 2020, <https://researchbriefings.files.parliament.uk/documents/SN04079/SN04079.pdf>.

10 Michael Peck, “China's H6-K Bomber Can Kill Targets 2,000 Miles Away,” *National Interest*, January 21, 2021, <https://nationalinterest.org/blog/reboot/china%E2%80%99s-h6-k-bomber-can-kill-targets-2000-miles-away-17672>; Matthew P. Funaiolo, Joseph S. Bermudez Jr., Brian Hart, “A Glimpse of Chinese Ballistic Missile Submarines,” Center for Strategic and International Studies, August 4, 2021, <https://www.csis.org/analysis/glimpse-chinese-ballistic-missile-submarines/>

11 Fiona Cunningham, “Nuclear Command, Control, and Communications Systems of the People's Republic of China,” NAPSNet Special Reports, July 18, 2019, <https://nautilus.org/napsnet/napsnet-special-reports/nuclear-command-control-and-communications-systems-of-the-peoples-republic-of-china/>.

12 Matthew Kroenig, *The Return of Great Power Rivalry: Democracy versus Autocracy from the Ancient World to the U.S. and China* (New York: Oxford University Press, 2020).

13 United States Senate, *Hearings Before the Committee on the Budget, United States Senate, Ninety Sixth Congress, First Session, Volume II* (Washington, DC: 1979), 140.

Furthermore, the spiral model is just one model of arms racing; the deterrence model explains that arms races can be desirable.<sup>14</sup> State A might be a revisionist state looking to engage in aggression or coercion by building forces to threaten State B and/or State B's allies and partners. In this case, from State B's perspective, arms racing is necessary for deterrence. State B's buildup can restore stability and prevent State A from gaining an advantage. This contributes to peace, and, in fact, arms racing can substitute for war. If a state can win the arms race, it can dissuade a hostile adversary from trying to gain sufficient military advantage to conduct an attack.

In sum, there are many theoretical reasons why action-reaction arms races do not often occur and why other factors may better explain what might superficially appear to be an action-reaction arms race. In the next section, we will consider whether recent history supports the spiral model of arms races.

## RECENT HISTORY

The post-Cold War history of US, Russian, and Chinese force posture decisions does not generally show evidence of action-reaction nuclear arms racing. National security policymakers and analysts are, of course, most interested in the future. However, since there is no data from the future, one can start with the data from the recent past. This issue brief will therefore analyze recent posture decisions of the nuclear great powers.

### United States

Have US posture decisions in recent years been driven by reactions to Russian and Chinese nuclear developments? For the most part, the answer is “no,” with an exception or two. The most important US nuclear posture decision is the triad modernization plan put in place by the administration of former US

President Barack Obama and continued by that of former US President Donald J. Trump and current President Joseph R. Biden, Jr.<sup>15</sup> This modernization program has not been driven by developments in Russia and China. All three legs of the US triad are beginning to age beyond their intended service lives.<sup>16</sup> Therefore, as long as the United States wanted to keep nuclear weapons, it was going to need to modernize these systems regardless of Beijing's and Moscow's actions.

There is also evidence for the absence of arms racing in nonstrategic nuclear weapons. US nonstrategic nuclear weapons currently consist of a handful of B-61 gravity bombs.<sup>17</sup> If there was arms racing going on, the United States would be matching Russia with nuclear torpedoes, nuclear depth charges, and nuclear surface-to-air missiles.<sup>18</sup> However, US nuclear strategists are not recommending those kinds of systems.<sup>19</sup> Instead, the United States has retained the B-61 gravity bombs that it has fielded for many decades as its only nonstrategic capability.

What about exotic nuclear weapons? One finds a lack of arms racing in that field as well. The Russians are building nuclear-armed, nuclear-powered submarine drones and cruise missiles, but in the United States, there is no interest in building matching capabilities.

Finally, there is no evidence of arms racing in intermediate-range nuclear missiles. China deploys hundreds or thousands of intermediate-range missiles that can be armed with nuclear warheads.<sup>20</sup> Following Russian cheating on the Intermediate-Range Nuclear Forces (INF) Treaty, the United States decided to withdraw.<sup>21</sup> Despite Russia's and China's developments, the United States is not considering building nuclear-armed INF-range missiles. Instead, Washington is investing in only conventionally

14 Glaser, “The Political Consequences of Military Strategy”; Jervis, *Perception and Misperception in International Politics*; James D. Fearon, “Rationalist Explanations for War,” *International Organization* Vol. 49, No. 3 (Summer, 1995), pp. 379-414, <https://www.jstor.org/stable/2706903>.

15 Jon Harper, “Biden to Stay Course on Nuclear Modernization,” *National Defense*, June 15, 2021, <https://www.nationaldefensemagazine.org/articles/2021/6/15/biden-to-stay-course-on-nuclear-modernization>.

16 Some have argued that US platforms capable of delivering nuclear and conventional weapons are uniquely destabilizing. For a counterargument, see: Matthew Kroenig and Mark J. Massa, “Are dual-capable weapon systems destabilizing? Questioning nuclear-conventional entanglement and inadvertent escalation,” Atlantic Council, June 16, 2021, <https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/are-dual-capable-weapon-systems-destabilizing/>.

17 Aaron Mehta, “Updated B61 nuclear warhead enters production,” *Breaking Defense*, December 3, 2021, <https://breakingdefense.com/2021/12/updated-b61-nuclear-warhead-enters-production/>.

18 Hans M. Kristensen and Matt Korda, “Russian nuclear weapons, 2021,” *Bulletin of the Atomic Scientists* 77, No. 2, 2021, p. 90-108, DOI: 10.1080/00963402.2021.1885869.

19 The exceptions to this statement are the nuclear-armed sea-launched cruise missile and low-yield warhead for the Trident II D-5 submarine-launched ballistic missile. These will be addressed later in the piece.

20 *Military and Security Developments Involving the People's Republic of China*, Office of the Secretary of Defense, 2021, <https://media.defense.gov/2021/Nov/03/2002885874/-1/-1/0/2021-CMPR-FINAL.PDF>.

21 “President Donald J. Trump to Withdraw the United States from the Intermediate-Range Nuclear Forces (INF) Treaty,” White House, February 1, 2019, <https://trumpwhitehouse.archives.gov/briefings-statements/president-donald-j-trump-withdraw-united-states-intermediate-range-nuclear-forces-inf-treaty/>.



A December 12, 2019, test launch of a prototype conventionally configured ground-launched ballistic missile with a range previously banned by the Intermediate-Range Nuclear Forces Treaty. The United States is not planning to develop nuclear-armed INF-range missiles. Michael Stonecypher 30th Space Wing Public Affairs, <https://www.dvidshub.net/video/728792/test-launch-vandenberg-air-force-base/>

armed missiles with this range.<sup>22</sup> In sum, for the most part, US modernization plans reveal meager reactions to nuclear developments in Russia or China.

The only exception to this lack of an action-reaction cycle may be the supplemental capabilities called for in the 2018 Nuclear Posture Review (NPR). The low-yield submarine-launched ballistic missile (SLBM) and the nuclear-armed sea-launched cruise missile (SLCM-N) clearly are direct responses to both Russia's nonstrategic nuclear advantage and its escalate-to-de-escalate strategy.<sup>23</sup> It is notable that,

even here, the Pentagon did not decide to match Russia capability-for-capability, warhead-for-warhead, but only to make sure that the United States has some limited capability in this space.<sup>24</sup>

In sum, looking at the record of US modernization, one finds very little evidence of reaction to Russia and China.

Beyond the United States, Russia and China are modernizing their nuclear capabilities. Is there an action-reaction cycle at work in these countries' modernization plans?

22 Jen Judson, "US Army's first mid-range missile battery coming in FY23 with 3 to follow," Defense News, June 21, 2021, <https://www.defensenews.com/land/2021/06/21/us-armys-first-mid-range-missile-battery-coming-in-fy23-with-three-to-follow/>.

23 *Nuclear Posture Review*, Office of the Secretary of Defense, February 2018, <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.

24 For more on the case for the SLCM-N, see John R. Harvey and Rob Soofer, "Enhancing Deterrence with SLCM-N," Atlantic Council, November 5, 2022, <https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/strengthening-deterrence-with-slcm-n/>.

## Russian Federation

For the most part, the same pattern holds for Russia. Moscow is pursuing nuclear modernization for reasons other than as responses to US or Chinese nuclear developments. When Russia started its most recent nuclear modernization campaign, neither the United States nor China had begun to build up their nuclear weapons. Russia nuclear modernization was therefore not a reaction to other nuclear powers, but rather an effort to maintain nuclear forces, given the aging of the Russian nuclear arsenal. Recent Russian nuclear modernization was not a response to nuclear weapons decisions made in the United States and China.

Similarly, Russia's production of nonstrategic weapons and intermediate-range weapons is not a response to nuclear developments in China and certainly not in the United States. The United States does not field intermediate-range nuclear missiles and has barely increased its small stockpile of nonstrategic weapons. It is possible that Russia's nonstrategic nuclear enhancements are a response to China's growth in this area. Most analysts, however, have interpreted Russia's investments in this area as an effort to back the Kremlin's aggressive escalate-to-de-escalate strategy that responds to the conventional imbalance that Moscow faces vis-à-vis NATO.<sup>25</sup> Indeed, Russia's military has struggled significantly in its invasion of Ukraine, and President Putin has resorted to the threat of tactical nuclear weapons to deter further Western support of Ukraine.<sup>26</sup> Despite farcical Russian propaganda to the contrary, these tactical nuclear threats are not coming in response to US or NATO efforts to use nuclear weapons against Russian troops or provide weapons of mass destruction to Ukraine.

For the most part, Russian nuclear modernization is not driven by nuclear weapons developments among the other nuclear powers.

A possible exception could be Russia's development of exotic weapons and hypersonic missiles, which do seem to be motivated by a concern about US missile defenses. While there is no danger that current US missile defenses could

seriously blunt a Russian attack, Russian strategists may be concerned about future developments in US missile defenses, such as directed-energy and space-based defenses.

In sum, the vast majority of Russian nuclear developments are not driven by US or Chinese nuclear posture enhancements.

## People's Republic of China

Next, let us consider if China's nuclear developments constitute an action-reaction arms race. To this point, China has largely focused on fielding a survivable nuclear arsenal, which is consistent with its longtime strategy of wanting a secure second strike, or a so-called "lean and effective" deterrent.<sup>27</sup> According to basic deterrence theory, these are the capabilities that any nuclear-armed state should desire. China's efforts to build ballistic missile submarines, stealthy strategic bombers, mobile missiles, and intermediate-range missiles make sense in the context of the security environment that China faces. None of these capabilities seem to be direct reactions to US or Russian nuclear weapons developments.

China's nuclear developments in the past two years, and those forecasted for the remainder of the decade, have seemed to exceed the requirements for a survivable second-strike force. For instance, the US Department of Defense recently estimated that China would likely increase its arsenal of deliverable nuclear warheads to at least one thousand by 2030—quadrupling or quintupling its existing force.<sup>28</sup> It has also tested nuclear-capable hypersonic missiles and built hundreds of intercontinental ballistic missile (ICBM) silos in its western desert.<sup>29</sup> While outside analysts do not completely understand why the Chinese government is making these decisions, there are four hypotheses. Whichever explanation is proven correct will give important evidence to claims of an action-reaction arms race.

The first hypothesis is that China is expanding its nuclear forces to guarantee survivability against an increasingly capable US strategic arsenal. China may be concerned about a potential "splendid" US first strike, after which missile defenses

25 Matthew Kroenig, "A strategy for deterring Russian de-escalation strikes," Atlantic Council, April 24, 2018, <https://www.atlanticcouncil.org/in-depth-research-reports/report/a-strategy-for-deterring-russian-de-escalation-strikes/>.

26 Annabelle Timsit and Rachel Pannett, "Western powers warn Russia could use 'dirty bomb' claim to escalate war," *Washington Post*, October 24, 2022, <https://www.washingtonpost.com/world/2022/10/24/dirty-bomb-russia-ukraine-war/>.

27 Eric Heginbotham, Michael S. Chase, Jacob L. Heim, Bonny Lin, Mark R. Cozad, Lyle J. Morris, Christopher P. Twomey, Forrest E. Morgan, Michael Nixon, Cristina L. Garafola, and Samuel K. Berkowitz, *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States*, RAND Corporation, 2017, [https://www.rand.org/content/dam/rand/pubs/research\\_reports/RR1600/RR1628/RAND\\_RR1628.pdf](https://www.rand.org/content/dam/rand/pubs/research_reports/RR1600/RR1628/RAND_RR1628.pdf).

28 *Military and Security Developments Involving the PRC*.

29 Demetri Sevastopulo and Kathrin Hille, "Launch in August of nuclear-capable rocket that circled the globe took US intelligence by surprise," *Financial Times*, October 16, 2021, <https://www.ft.com/content/ba0a3cde-719b-4040-93cb-a486e1f843f>; 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/>.



Military vehicles carrying hypersonic missiles DF-17 travel past Tiananmen Square during the military parade marking the 70th founding anniversary of People's Republic of China, on its National Day in Beijing, China October 1, 2019. REUTERS/Jason Lee.

could defeat a “ragged retaliation.” As such, China seeks to develop more nuclear weapons to overwhelm any US disarming efforts while simultaneously seeking to protect its nuclear arsenal by developing increasingly survivable capabilities.

There are reasons to be skeptical of this explanation—both because developments in US nuclear forces do not appear to be driving China's nuclear buildup, and because the specific systems which China is developing do not comport well with a desire to increase survivability. First, the United States withdrew from the Anti-Ballistic Missile (ABM) Treaty in 2002 and fielded limited capabilities of the Ground-Based Midcourse Defense in 2005.<sup>30</sup> Why has China expanded its nuclear force twenty years after the beginning of the United States' national missile defense program? This would be a two-decade delay in a theoretical action-reaction arms race. If the withdrawal

from the ABM Treaty was the motivation, why would China wait two decades to react? Second, fixed ICBM silos are relatively easy to target and destroy with nuclear weapons and are therefore not the best way to improve survivability. For these reasons, it seems unlikely that survivability explains China's nuclear buildup.

A second hypothesis is that these capabilities reveal a change in China's nuclear strategy. China's current retaliatory strategy focuses on countervalue targeting—aiming its nuclear weapons at major population and economic centers. However, a growing number of warheads on multiple independently targetable reentry vehicles (MIRVs), fixed silo-based ICBMs, increasingly accurate missiles, and more sophisticated NC3 (including space-based early warning) suggest that China might instead be shifting to a counterforce nuclear strategy—

30 Ian Williams, Tom Karako, and Wes Rumbaugh, *Missile Defense 2020: Next Steps for Defending the Homeland*, Center for Strategic and International Studies, April 7, 2017, <https://missilethreat.csis.org/evolution-homeland-missile-defense/>.



targeting the nuclear weapons of its potential adversaries.<sup>31</sup> The United States and Russia practice counterforce targeting strategies.<sup>32</sup> Moreover, the US Department of Defense has suggested that China's evolving nuclear posture is preparing China to abandon its "no first use" policy and instead shift to launch on warning (that is, a posture of launching its nuclear weapons as soon as it detects an incoming nuclear attack—before the incoming weapons destroy Chinese nuclear forces on the ground).<sup>33</sup>

If that is the case, it is difficult to interpret China's nuclear developments as a reaction to US or Russian moves, except in the broadest sense that such a posture mimics the superpowers' example from the Cold War. The main motivating factor, under this hypothesis, is a decision within Chinese leadership to change its nuclear strategy, rather than a reaction to specific nuclear capabilities developed by the United States or Russia.

A third hypothesis is that China is developing nuclear weapons as a backstop to conventional aggression.<sup>34</sup> Chinese President Xi Jinping has refused to rule out the use of military force in conquering Taiwan.<sup>35</sup> In the event of an invasion, China might seek to brandish its nuclear arsenal to deter a US intervention. Because China's greater nuclear arsenal is more survivable against a possible US nuclear first strike and could inflict more damage against the United States, US leaders might be more cautious to intervene. China could use nuclear weapons against the forces or bases of Taiwan, the United States, or US allies to seek to compel an end to hostilities on favorable terms.

A fourth hypothesis for China's recent nuclear behavior is that it has been motivated by Xi's desire to advance the People's Liberation Army (PLA) to superpower status. Leadership decisions on the direction of the PLA's nuclear forces may not be based on arcane nuclear deterrence theory at all. Rather,

Xi has declared that China must have a "world class" military by 2049, and a world-class military needs world-class nuclear forces.<sup>36</sup> This comports with China's overall assertiveness in its foreign and security policy, from cracking down on democracy in Hong Kong, to encouraging "wolf warrior" diplomacy abroad, to increasing military pressure on Taiwan.<sup>37</sup> In short, Xi may have decided to develop a superpower nuclear arsenal, but the PLA must still determine how to use it. In this case, Xi's decision to shift China's geopolitical orientation is a more important motivation for the nuclear buildup than any weapons systems developed by a nuclear rival.

Based on this analysis, recent history does not provide evidence for tightly coupled action-reaction nuclear arms races among the three great powers in the twenty-first century. The third and final section of this issue brief will consider if this trend will hold and if a possible tripolar arms race can be foreseen.

## THE POTENTIAL FOR A FUTURE TRILATERAL ARMS RACE

There is risk of an action-reaction race in strategic nuclear arms in the coming decades among the United States, Russia, and China, though there is much less of a prospect for an arms race in theater nuclear forces.

### Nonstrategic Nuclear Forces

At the nonstrategic level, the conditions would seem ripe for an arms race, but the United States has essentially opted out and remains unlikely to change that position for a variety of political and strategic reasons. Russia and China continue to develop hundreds to thousands of nonstrategic nuclear weapons with shorter ranges and lower yields. There are plausible strategic reasons for the United States to compete in this arms race. First, the United States has sought for decades to

31 "DF-41 (Dong Feng-41 / CSS-X-20)," Missile Defense Project, Center for Strategic and International Studies, August 12, 2016, last modified July 31, 2021, <https://missilethreat.csis.org/missile/df-41/>; Alexander Korolev, "China–Russia cooperation on missile attack early warning systems," East Asia Forum, November 20, 2020, <https://www.eastasiaforum.org/2020/11/20/china-russia-cooperation-on-missile-attack-early-warning-systems/>.

32 Kroenig, *The Logic of American Nuclear Strategy*.

33 *Military and Security Developments Involving the PRC*.

34 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 (Spring 2017), pp. 50–92, <https://www.belfercenter.org/publication/would-china-go-nuclear-assessing-risk-chinese-nuclear-escalation-conventional-war>.

35 "Experts react: Tracking the biggest takeaways from China's Communist Party Congress," Atlantic Council, October 17, 2022, <https://www.atlanticcouncil.org/blogs/new-atlanticist/experts-react-what-the-world-needs-to-know-from-chinas-communist-party-congress/>.

36 *Military and Security Developments Involving the PRC*, I.

37 Claire Moses, "China's Crackdown on Hong Kong," *New York Times*, June 23, 2021, updated August 8, 2021, <https://www.nytimes.com/2021/06/23/briefing/china-hong-kong-apple-daily-closure.html>; Peter Martin, "Understanding Chinese 'Wolf Warrior Diplomacy,'" National Bureau of Asian Research, October 22, 2021, <https://www.nbr.org/publication/understanding-chinese-wolf-warrior-diplomacy/>; Gerry Doyle, Anand Katakam, Ben Blanchard, and Marco Hernandez, "The skies over the South China Sea," Reuters, October 19, 2021, Updated October 20, 2021, <https://graphics.reuters.com/TAIWAN-CHINA/byvjrjmgvne/>.

maintain “a nuclear capacity second to none,” in the words of former US President John F. Kennedy.<sup>38</sup> Further, nuclear superiority is correlated with positive outcomes in nuclear crises.<sup>39</sup> Russian and Chinese theater nuclear weapons pose a thorny dilemma to US strategists, as both states could perceive an ability to gain advantage from theater nuclear use if they believed that the United States lacked the capabilities to respond without resorting to strategic nuclear weapons.<sup>40</sup>

Moreover, competing through theater nuclear weapons would allow the United States to counter nuclear growth in Russia and China while complying with the limits of the New START arms control pact, which is in force through 2026.

For domestic political and strategic reasons, the US response in the nonstrategic arena has so far been, and will likely remain, very limited. The 2018 Nuclear Posture Review (NPR) announced that the United States would develop a low-yield warhead for its submarine-launched ballistic missiles.<sup>41</sup> These have entered the force, though in small numbers.<sup>42</sup> The 2018 NPR also called for a nuclear-armed sea-launched cruise missile (SLCM-N), which the 2022 NPR decided to cancel but which Congress may yet fund.<sup>43</sup>

Beyond politics, US nuclear strategy does not aim to match Russia and China warhead for warhead in theater nuclear weapons. The “supplemental capabilities” called for in the 2018 NPR are designed to convince Russia and China that there is no escalation gap to exploit and, if deterrence fails, to restore it at the lowest possible level of damage. As such, the United States only needs theater nuclear weapons sufficient to demonstrate credible capability in this space. Further, the United States would need its allies to host on their sovereign territory many possible future theater-range weapons concepts, which could prove difficult. While some in the United

States have advocated for the development of nuclear-capable, ground-based missiles with the ranges of 500 to 5,500 kilometers previously banned by the INF Treaty, these proposals have not yet gained much traction.<sup>44</sup>

It is plausible, but unlikely, that Russia and China would engage in a theater-range action-reaction arms race against each other. While Putin and Xi pledged a Russia-China relationship “without limits,” China’s support for Russia has been less than complete during the Russian invasion of Ukraine.<sup>45</sup> Further, these nations’ long, shared border and history of animosity could lead to a theater-range nuclear competition in the future.

### Strategic Nuclear Forces

In contrast to the likely lack of a three-way competition in theater nuclear arms building, there is a danger of a three-way strategic nuclear arms race in the coming decades. Russia and especially China plan to increase their strategic nuclear forces, leaving the United States with an important choice on how to respond. Traditionally, US nuclear force sizing has effectively proceeded by counting the number of nuclear-relevant targets in its adversaries, assigning an appropriate number of warheads to each target, and developing a nuclear force capable of reliably delivering that number of warheads.<sup>46</sup> US arms control strategy has relied on working with other states to pare down any warheads in excess of that number in a verifiable way. In 2010, the United States agreed with Russia to set that level at 1,550 accountable strategic warheads as part of New START. Twelve years later, the international security environment is dramatically different, and it strains credulity to believe that the United States can remain locked into 1,550 warheads while Russia builds unaccountable nuclear weapons and while China undertakes an unprecedented buildup. Importantly, China also appears to be adapting its

38 John F. Kennedy, “Speech of Senator John F. Kennedy, Sheraton Park Hotel, Washington, DC,” September 20, 1960, <https://www.presidency.ucsb.edu/documents/speech-senator-john-f-kennedy-sheraton-park-hotel-washington-dc>.

39 Kroenig, *The Logic of American Nuclear Strategy*.

40 Kroenig, “A strategy for deterring Russian de-escalation strikes.”

41 *Nuclear Posture Review*, 2018.

42 John Rood, “Statement on the Fielding of the W76-2 Low-Yield Submarine Launched Ballistic Missile Warhead,” Department of Defense, February 4, 2020, <https://www.defense.gov/News/Releases/Release/Article/2073532/statement-on-the-fielding-of-the-w76-2-low-yield-submarine-launched-ballistic-m/>.

43 *Nuclear Posture Review*, 2018; Bryan Bender, “Biden team weighs killing Trump’s new nuclear weapons,” Politico, January 12, 2022, <https://www.politico.com/news/2022/01/12/biden-trump-nuclear-weapons-526976>; Jamie McIntyre, “Bipartisanship reigns as House panel bulks up annual defense policy bill with more money and weapons,” *Washington Examiner*, June 23, 2022, <https://www.washingtonexaminer.com/policy/defense-national-security/bipartisanship-reigns-as-house-panel-bulks-up-annual-defense-policy-bill-with-more-money-and-weapons>.

44 Rebecca L. Heinrichs and Tim Morrison, “Put US Post-INF Missiles into Production,” Defense One, December 20, 2019, <https://www.defenseone.com/ideas/2019/12/put-post-inf-missiles-production/162032/>.

45 “Moscow-Beijing partnership has ‘no limits,’” Reuters, February 4, 2022, <https://www.reuters.com/world/china/moscow-beijing-partnership-has-no-limits-2022-02-04/>.

46 Kroenig, *The Logic of American Nuclear Strategy*.



Russian President Vladimir Putin held talks in Beijing with General Secretary of the Communist Party and President of China Xi Jinping in February 2022. Russia-China collaboration and China's nuclear expansion together pose a challenge to US nuclear deterrence. Courtesy Presidential Executive Office of Russia, <http://en.kremlin.ru/events/president/news/67712>

nuclear strategy beyond just numbers. It is building a more robust set of delivery vehicles, improving its early warning, and developing national missile defenses.<sup>47</sup> All of these factors will challenge US strategy.

If the United States maintains its current strategy, these developments will place significant upward pressure on the size of the US nuclear arsenal. The author of this issue brief, other nuclear experts, and US government institutions like the US-China Economic and Security Review Commission have recommended that the United States review its current nuclear force size.<sup>48</sup>

US strategists may decide not to increase the size of the US arsenal for a variety of reasons. The United States may elect not to build beyond 1,550 to honor its commitment to New START, at least through its 2026 expiration. An alternative US nuclear strategy of minimum deterrence would require no buildup at

all and would permit the reduction of nuclear forces as adversaries increased theirs. It is also possible that the United States could maintain its current targeting strategy, accepting greater risk and a reduced probability of its ability to destroy all relevant nuclear targets. In any of these cases, the United States would not participate in an action-reaction cycle.

If, on the other hand, the United States maintains its long-standing and successful nuclear deterrence strategy, then a modest increase will be required. Whether the United States decides to withdraw from New START or wait until its 2026 expiration, it will likely need to build up its nuclear forces. The key question is whether Russia and China will respond.

It is not a foregone conclusion that Russia and China would react to a US increase in strategic forces with their own buildup. Russia seems unlikely to accept a second-tier status in strategic forces. Although a possible off-ramp would be a treaty

47 *Military and Security Developments Involving the People's Republic of China*, 2022.

48 "Comprehensive List of the Commission's Recommendations," U.S.-China Economic and Security Review Commission, November 2021, [https://www.uscc.gov/sites/default/files/2021-11/2021\\_Comprehensive\\_List\\_of\\_Recommendations.pdf](https://www.uscc.gov/sites/default/files/2021-11/2021_Comprehensive_List_of_Recommendations.pdf); Franklin C. Miller, "Opening Remarks," Senate Armed Services Committee, Strategic Forces Subcommittee, April 28, 2021, <https://www.armed-services.senate.gov/imo/media/doc/4-28-21%20-%20Statement%20-%20Miller.pdf>; Matthew Kroenig, "The Special Role of US Nuclear Weapons," Atlantic Council, September 2021, [https://www.atlanticcouncil.org/wp-content/uploads/2021/09/Special\\_role\\_of\\_nuclear\\_weapons\\_090721.pdf](https://www.atlanticcouncil.org/wp-content/uploads/2021/09/Special_role_of_nuclear_weapons_090721.pdf).

covering all nuclear warheads, as agreed to in principle in the waning days of the Trump administration.<sup>49</sup> Should Russia seek to match a possible US nuclear increase, that reaction would likely continue to place upward pressure on the size of the US nuclear force.

Further, while it is unclear that China will seek to match the United States and Russia warhead for warhead, China may be on track to achieve near numerical parity with the nuclear superpowers. The DoD's 2022 Military and Security Developments Involving the People's Republic of China reports that "If China continues the pace of its nuclear expansion, it will likely field a stockpile of about 1500 warheads by its 2035 timeline."<sup>50</sup> (The DoD estimates that "most of" China's nuclear warheads will be deliverable at the intercontinental level by 2030; the rest presumably will be assigned to delivery vehicles that would not be considered strategic or otherwise not be accountable under New START standards.)<sup>51</sup>

One interesting possibility is that neither the United States nor Russia would accept second-tier status, but that China would reject such a paradigm and instead settle with less than parity. In that case, it could be possible for the United States and Russia to renegotiate an arms control treaty with higher caps than the ones in New START. Before New START, US-Russia arms control was governed by the Strategic Offensive Reductions Treaty (SORT, or the Moscow Treaty), which established a strategic nuclear forces limit of 1,700 to 2,200 nuclear forces for both sides.<sup>52</sup> There may be a stable arrangement that would allow the United States and Russia to both claim parity, but at a higher force level which gives the United States the ability to hold at risk existing and new targets in Russia and China.



Russian President Vladimir Putin and US President George W. Bush sign the Strategic Offensive Reductions Treaty (SORT) in Moscow in May 2002. It is possible that future arms control arrangements could limit the United States and Russia to higher warhead numbers than under New START, as SORT did. White House Photo, <https://georgewbush-whitehouse.archives.gov/news/releases/2002/05/20020524-10.html>

## RECOMMENDATIONS

This understanding of the potential nuclear arms race dynamics in the 2020s and 2030s lends itself to several policy recommendations:

1. The motivation behind China's nuclear buildup is a key variable in assessing the possibility of a future arms race. Understanding these drivers should be a key priority for US intelligence agencies.

49 Kingston Reif and Shannon Bugos, "U.S., Russia Extend New START for Five Years," *Arms Control Now*, Arms Control Association, February 5, 2021, <https://www.armscontrol.org/blog/2021-02/us-russian-nuclear-arms-control-watch/>.

50 *Military and Security Developments Involving the People's Republic of China 2022*, Office of the US Secretary of Defense, November 29, 2022, IX, <https://media.defense.gov/2022/Nov/29/2003122279/-1/-1/1/2022-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF>.

51 Ibid, 97.

52 Daryl Kimball and Kingston Reif, "The Strategic Offensive Reductions Treaty (SORT) At a Glance," Arms Control Association, September 2017, <https://www.armscontrol.org/factsheets/sort-glance>.

2. An increase in the number and type of US nonstrategic nuclear weapons is unlikely to touch off an action-reaction arms race. The United States should continue to develop the SLCM-N and consider other theater-range nuclear weapons.
3. The United States should maintain its current nuclear strategy, including those elements related to targeting and force-sizing. It is not a foregone conclusion that Russia and China would respond to a US nuclear arms buildup. If they did, however, the United States would be better off dealing with the consequences of a nuclear arms race than accepting the risks of deterrence failure.
4. In designing its own nuclear forces and negotiating arms control arrangements with Russia and/or China, the United States could consider privileging those forces which are able to expand their deliverable warheads without increasing the number of nuclear targets and attempt to shape adversary forces in the same way. This may allow for a measure of stability—albeit at higher strategic force levels—even under the condition of tripolarity. Congress should prioritize fully resourcing the Department of Energy, including the National Nuclear Security Administration, to support the manufacturing capacity and workforce to carry out such an expansion if needed.

## ABOUT THE AUTHOR

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