

# Strategic Missile Defense and Nuclear Arms Control

## Aspirations and Achievable Goals

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This article considers the context of the current technology and policy climate to determine the favorability of a nationwide missile defense system that would protect the United States against a large-scale attack from a major power such as Russia or China. By studying the technology, including pertinent discussions of missile defenses and their relation to Russian and American security policy, this article establishes some analytical benchmarks for missile defenses and their probable impacts on nuclear deterrence, arms control, and politics. In short, missile defenses have utility, but they are not a panacea for defending the nation against ballistic missile attack.

The role of missile defenses in American national security policy and arms control remains a contentious issue more than six decades since they were first seriously contemplated. Cold War experience suggested that a ballistic missile attack would inevitably overwhelm any nationwide ballistic missile defenses (BMD) but could be useful in the event of a limited attack.<sup>1</sup> Such missile defenses could raise the number of intercontinental ballistic missiles (ICBMs) needed to destroy an adversary's ICBM force.<sup>2</sup> Thus, they were useful, but only in certain circumstances.

Since the 1980s, significant research and development funding sought to improve missile defense technologies within the constraints of the Anti-Ballistic Missile Treaty, the 1972 arms control treaty between the United States and the Soviet Union that limited antiballistic missile systems to a small number of systems in a designated area. The United States largely abandoned ballistic missile defenses, while the Soviets primarily focused on nuclear-tipped missiles defending Moscow.<sup>3</sup> Deployable ballistic missile defenses against

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1. Stephen Hildreth, *Ballistic Missile Defense: Historical Overview*, RS 22120 (Washington, DC: Congressional Research Service [CRS], 2008), 2, <https://crsreports.congress.gov/>.

2. Adam Lowther and Derek Williams, "Why America Has a Launch under Attack Option," *War on the Rocks*, July 10, 2023, <https://warontherocks.com/>.

3. Jeff Sessions, "Ballistic Missile Defense: A National Priority," *Strategic Studies Quarterly* 2, no. 2 (2008); and see also David Yost, *Soviet Ballistic Missile Defense and the Western Alliance* (Cambridge, MA: Harvard University Press, 1988).

threats of short-, medium-, and intermediate-ranges made considerable strides since the Cold War ended. But the greater challenge remains in developing and deploying an effective nationwide system that protects the population against large-scale attacks by major powers such as Russia or China.<sup>4</sup>

Will the emerging strategic environment over the next decade or more prove more favorable to the development of preclusive defenses against large-scale attacks? Forecasts are uncertain, but the Strategic Posture Commission's final report offers sound insight into what future threats may look like.<sup>5</sup> Based on the congressional commission's analysis and that of the authors, it appears several broad factors will play an important role in the future.

First, the United States is entering an era of advanced precision strike regimes. More kinds of long-range attacks, with improved accuracies for conventional or nuclear weapons, are now possible against point or area targets.<sup>6</sup> The number and variety of such attacks will only increase over time. Second, the significance of the space and cyber domains for all levels of warfare is becoming more apparent to major powers, other states, and even nonstate actors.<sup>7</sup> The importance of space in early warning, surveillance, and reconnaissance, and potentially strike, is growing.

Third, the digitization of knowledge and experience, together with the globalization of communications and commerce, produced the MOM factor—the preeminence of mind over matter. This context places at the center of military-strategic planning and thinking the need for mastery of the human-machine interface.

For example, the growing significance of artificial intelligence (AI) radiates outward into broader effects on the ability of the United States to master control of the observe, orient, decide, and act loop (OODA) compared to its competitors.<sup>8</sup> How much decision making of what kind can be delegated to machine learning is the great debate among corporate, political, and military leaders today and for the next several decades.<sup>9</sup> As the

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4. See Michaela Dodge, *Missile Defense Reckoning Is Coming: Will the United States Choose to Be Vulnerable to All Long-Range Missiles?* (Fairfax, VA: National Institute for Public Policy, 2020); and see also Andrew Futter, *Ballistic Missile Defense and US National Security Policy: Normalization and Acceptance after the Cold War* (New York: Routledge, 2013).

5. Madelyn Creedon and John Kyl, *America's Strategic Posture* (Washington, DC: Institute for Defense Analysis, 2023), <https://armedservices.house.gov/>.

6. See Amy Wolf, *Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues* (Washington, DC: CRS, 2021); and Thomas Newdick, "Takeaways from Russia's Missile War on Ukraine," *War Zone*, November 14, 2023, <https://www.twz.com/>.

7. For example, see Brian Weeden and Victoria Samson, eds., *Global Counterspace Capabilities: An Open-Source Assessment* (Washington, DC: Secure World Foundation, 2023); and David E. Sanger, *The Perfect Weapon: War, Sabotage, and Fear in the Cyber Age* (New York: Crown Publishing, 2018).

8. John Boyd, "The Essence of Winning and Losing," slide presentation, 1995, <https://coljohnboyd.com/>.

9. George Galdorissi and Sam Tangredi, "Algorithms of Armageddon: What Happens When We Insert AI into Our Military Weapons Systems?" (presentation, Department of Defense [DoD] Strategic Multilayer Assessment, April 27, 2021).

Strategic Posture Commission emphasizes, Russia and China are seeking to master these areas. In some instances they are well ahead of the United States.

Does the preceding context open the door to a technology and policy climate more favorable to the emergence of strategic missile defenses? This article considers the political setting for Russian and American missile defense and related issues of nuclear arms control and deterrence. In studying the technology, including pertinent discussions of missile defenses and their relation to Russian and American security policy, this article establishes some analytical benchmarks for missile defenses and their probable impacts, if any, on Russo-American nuclear deterrence, arms control, and politics.

## **The Political Setting**

Russia and the United States began drifting into separate orbits on issues related to nuclear arms control soon after the 2010 conclusion of the New Strategic Arms Reduction Treaty (New START). Russia's annexation of Crimea (2014) and its invasion of Ukraine (2022) put further consideration of nuclear arms control on hold during the first two years of the Biden presidency—even as the administration attempted to coax Russia to remain a partner.<sup>10</sup> Russia's announced suspension of New START in spring 2023 and disinterest in any follow-on agreement added to the impasse on security issues between Moscow and Washington. Even if a settlement of Russia's war in Ukraine is reached before New START's expiration in 2026, a restart of the arms control process would involve a number of thorny issues.<sup>11</sup>

Included among the bones of contention is the question of American ballistic missile defenses, including homeland missile defenses and US contributions to NATO's European Phased Adaptive Approach for missile defenses in Europe designed to protect it against short-, medium-, and intermediate-range ballistic missiles launched from Iran.<sup>12</sup> At every opportunity, Russian President Vladimir Putin and other high-ranking Russian officials raise objections to American plans for deploying components of missile defense systems

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10. Nicholas Gvosdev, "The Confrontation with Russia and US Grand Strategy," Foreign Policy Research Institute, February 16, 2023, <https://www.fpri.org/>; and Hanna Notte, "US Russian Relations Can Still Get Worse," *War on the Rocks*, February 22, 2023, <https://warontherocks.com/>.

11. Steven Pifer, "The US and Russia Must Re-assess Their Strategic Relations in a World without New START," *Bulletin of the Atomic Scientists*, June 13, 2023, <https://thebulletin.org/>; see also Stephen J. Cimbala and Adam Lowther, "The Future of Strategic Nuclear Arms Control," *Perspectives: Aether-ASOR*, March 1, 2023, <https://www.airuniversity.af.edu/>; and Stephen J. Cimbala and Lawrence J. Korb, "Reviving Arms Control, Post-Ukraine: Why New START Still Matters," *Bulletin of the Atomic Scientists*, July 13, 2022, <https://thebulletin.org/>.

12. Karen Kaya, "NATO Missile Defense and the View from the Front Line," *Joint Forces Quarterly* 71, no. 4 (2013); also see Steven J. Whitmore and John R. Deni, *NATO Missile Defense and the European Phased Adaptive Approach: The Implications of Burden Sharing and the Underappreciated Role of the U.S. Army* (Carlisle, PA: Strategic Studies Institute, 2013); Patrick J. O'Reilly, "Ballistic Missile Defense Overview" (presentation, 10th Annual Missile Defense Conference, Washington, DC, March 26, 2012); and *NATO Ballistic Missile Defense (BMD) Fact Sheet* (Brussels: NATO, 2012), <https://www.nato.int/>.

ashore and afloat in Europe.<sup>13</sup> Russian political and military leaders indicate that they may hold hostage other nuclear arms control agreements and engage in offensive countermeasures to thwart any American defenses.<sup>14</sup>

Prior to its war against Ukraine, Russia expected to modernize its strategic nuclear forces within the constraints of New START. The treaty required the United States and Russia to reduce their numbers of operationally deployed strategic nuclear warheads—including ICBMs, submarine launched ballistic missiles, and heavy bombers—to 1,550 on no more than 700 delivery vehicles by the end of 2018.<sup>15</sup> Additionally, the treaty provided for inspections and verification measures to ensure compliance. New START, however, began to fall apart long before the invasion of Ukraine. Even before the beginning of the coronavirus pandemic, Russia ceased its participation in onsite inspections, which were a key verification requirement in the treaty.<sup>16</sup>

Nuclear arms control is one important tool for American and Russian leaders, but it is not a substitute for coherent foreign policy, nor for well-thought-out military strategy. States do not fight because they have arms, but because they have political disputes that they are either unable or unwilling to resolve by means short of war. As instruments of warfighting, nuclear weapons offer a poor menu of options. The deterrent value of nuclear weapons lies in their capacity to destroy targets that adversaries value, even as nations think about how to limit collateral damage from an adversary's use of nuclear weapons against the homeland.

Deterrence is a psychological transaction between states in a competitive, and probably adversarial, relationship. How can one know that a prospective opponent is truly “deterred” from one or another course of action? The absence of an undesired behavior does not demonstrate the success or failure of deterrence, because other reasons may cause the prospective attacker to hesitate. Causation in matters of international politics, especially war and peace, is complex and includes a mix of objective and subjective factors. Even after the fact, historians argue about the causes of major wars. Politicians coping with the same decisions in real time are even more challenged to get it right.

Nuclear weapons grew up with the Cold War and with the adjustment of the Americans and Soviets to the idea of mutual deterrence and its military support. The Cold War superpowers and their militaries had time to adjust to the idea that the threat of nuclear war could be a necessary means to the avoidance of nuclear war or conventional war with a significant possibility of escalation into nuclear first use.

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13. Jack Detsch, “Putin’s Fixation with an Old-School U. S. Missile Launcher,” FP [*Foreign Policy*], January 12, 2022, <https://foreignpolicy.com/>.

14. Detsch; and see also “Ballistic Missile Defence,” NATO, last updated July 26, 2023, <https://www.nato.int/>.

15. Treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms, April 8, 2010, Treaty Document 111-5, <https://www.state.gov/>.

16. Mike Eckel, “How Bad Are Things between Russia and the US? They Can’t Even Agree to Discuss Nuclear Weapons Inspections,” RadioFreeEurope, December 2, 2022, <https://www.rferl.org/>.

The post-Cold War environment is unlikely to proceed at such a leisurely pace as did the first nuclear age.<sup>17</sup> Instead, new nuclear forces in Asia and elsewhere are chasing a clock of nuclear multipolarity.<sup>18</sup> Already nuclear armed states in Asia include Russia, China, India, Pakistan, and North Korea. Japan and South Korea are the two most likely nations to go nuclear in the years ahead.<sup>19</sup>

Decisions by Washington and Moscow about their bilateral nuclear deterrence relationship are also related to the issue of nuclear proliferation—in Asia and elsewhere. China's nuclear modernization has immediate implications for Russia, India, Japan, South Korea, Taiwan, and the United States.<sup>20</sup> Should Iran choose the nuclear option, it will possess the capability to threaten not only Israel and the broader Middle East, but also much of Europe. An Iranian decision to go nuclear could very well set off a nuclear proliferation cascade with Saudi Arabia, Turkey, and Egypt purchasing the “Sunni bomb” from Pakistan.<sup>21</sup> North Korean nuclear weapons raise issues with respect to future Chinese, Japanese, Russian, American, and South Korean foreign policy.

The ability of the Americans and Russians to impose Cold War-style proliferation discipline over aspiring nuclear powers is a historical artifact that the United States is currently testing in South Korea and Japan. A Sino-American conflict over Taiwan would likely call the validity of the Washington Declaration—the mutual defense commitment made by Biden and South Korean President Yoon Suk Yeol in 2023 that allows for joint planning in response to North Korean nuclear employment—into question and potentially spark proliferation by both South Korea and Japan.<sup>22</sup> Such an act would undermine the credibility of American extended deterrence in Asia and, possibly, Europe.

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17. See David A. Cooper, *Arms Control for the Third Nuclear Age: Between Disarmament and Armageddon* (Washington, DC: Georgetown University Press, 2021); Keith B. Payne and David J. Trachtenberg, *Deterrence in the Emerging Threat Environment: What is Different and Why it Matters* (Fairfax, VA: National Institute for Public Policy, 2022); Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Henry Holt, 2012); and Michael Krepon, *Better Safe Than Sorry: The Ironies of Living with the Bomb* (Stanford: Stanford University Press, 2009).

18. Christopher Preble, Zach Cooper, and Melanie Marlowe, “The Risk of Nuclear Proliferation in Asia,” *War on the Rocks*, December 22, 2022, <https://warontherocks.com/>.

19. Stephen Cimbala, *The United States, Russia, and Nuclear Peace* (New York: Palgrave-McMillan, 2020).

20. See Center for Global Security Research Study Group, *China's Emergence as a Second Nuclear Peer: Implications for US Nuclear Deterrence Strategy* (Livermore, CA: Lawrence Livermore National Laboratory, 2023).

21. Hamza Mjahed, “The Nuclearization of the Middle East,” *Policy Center for the New South, Policy Brief 20-76* (September 2020), <http://large.stanford.edu/>; and Aderito Vicente, “The Imminent Risk of Nuclear Proliferation in the Middle East,” *EUIdeas*, November 12, 2019, <https://euideas.eui.eu/>.

22. Ankit Panda, “The Washington Declaration Is a Software Upgrade for the US-South Korea Alliance,” Carnegie Endowment for International Peace, May 1, 2023, <https://carnegieendowment.org/>.

## Missile Defenses Then and Now

Missile defenses were controversial almost from the dawn of the nuclear age and remain so.<sup>23</sup> Nuclear weapons and long-range ballistic missiles seemed to overturn the historical dictum that, for every offense, there is a defense. Despite the research and development efforts of American and Soviet/Russian scientists throughout the Cold War and afterward, neither state was able to deploy nationwide missile defenses competitive with the speed and destructiveness of offenses.<sup>24</sup>

Part of the problem is that the technical task of missile defenses is much harder than that assigned to offenses.<sup>25</sup> Unless they were based on very advanced principles and/or partly based in space, missile defenses had to “hit a bullet with a bullet” during one of the four phases of the trajectory of a ballistic missile in flight. Interception had to take place within approximately 20 minutes of launch. Attack characterization and response require strategic and tactical indications and warning, reconnaissance, surveillance, and command and control systems that must perform flawlessly.

Because of the destructiveness of nuclear weapons, the attacker needs to penetrate the defenses with only a small percentage of their first-strike weapons. The defender, in contrast, must achieve perfect or nearly perfect intercept and destruction of attacking warheads. Otherwise, even if retaliatory forces were saved from destruction, collateral damage to populations is potentially enormous. The problem of indications and warnings provides one example of the difficulty of challenges facing prospective ballistic missile defense systems.<sup>26</sup>

New information and electronics technologies may bring new hope to proponents of missile defenses. Regarding the challenge posed by hypersonic weapons, for example, the US Missile Defense Agency (MDA) is integrating tracking capabilities among existing ground-based, sea-based, and space-based radars.<sup>27</sup> Aegis ships are now able to engage some hypersonic threats in the terminal phase of the attacking missile’s flight path.<sup>28</sup> The

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23. Graham Spinardi, “Technical Controversy and Ballistic Missile Defence: Disputing Epistemic Authority in the Development of Hit-to-Kill Technology,” *Science as Culture* 23, no. 1 (2014), <https://doi.org/>.

24. See Rebecca Slayton, *Arguments That Count: Physics, Computing, and Missile Defense, 1949–2012* (Cambridge, MA: MIT Press, 2013); Donald R. Baucom, *The Origins of SDI, 1944–1983* (Lawrence: University Press of Kansas, 1992); Frances FitzGerald, *Way Out There in the Blue: Reagan, Star Wars and the End of the Cold War* (New York: Simon and Schuster, 2000); and Jennifer G. Mathers, *The Russian Nuclear Shield from Stalin to Yeltsin* (New York: St. Martin’s Press, 2000).

25. Steven Hildreth et al., *Missile Defense: The Current Debate*, RL 31111 (Washington, DC: CRS, 2005).

26. Thomas K. Hensley et al., “Understanding the Indications and Warning Efforts of US Ballistic Missile Defense,” *Joint Force Quarterly* 78, no. 3 (2015).

27. See Stephen J. Cimbala and Adam B. Lowther, “Hypersonic Weapons and Nuclear Deterrence,” *Comparative Strategy* 41, no. 3 (2022); and Stephen Reny, “Nuclear-Armed Hypersonic Weapons and Nuclear Deterrence,” *Strategic Studies Quarterly* 10, no. 4 (2020).

28. Abraham Mahshie, “Hypersonics Defense,” *Air & Space Forces Magazine*, January 19, 2022, <https://www.airandspaceforces.com/>.

agency is working with the Navy to upgrade sea-based terminal defenses against more advanced hypersonic and maneuvering threats.

The MDA and the US Space Force are also working together to develop hypersonic ballistic tracking from space.<sup>29</sup> According to Navy Vice Admiral Jon A. Hill, former director of MDA, due to the global maneuver capabilities of hypersonic missiles, “A space-based tracking and targeting capability is in clear need.”<sup>30</sup> With regard to ground-based missile defenses, the United States began deploying missile defenses in Alaska and California during the first term of President George W. Bush. It would not be too surprising if the near future sees dramatic technological breakthroughs in these and other missile defenses.

In recognition of the possibility that missile defenses may improve, offenses are unlikely to stand still. The standard scenario of Russo-American nuclear missile attack, with multiple firings of land-, sea-, and air-based missiles, will give way to improvised scenarios developed by new proliferators and smaller nuclear powers.<sup>31</sup>

Nuclear-capable short- and medium-range ballistic missiles are already commingled with conventional ground and tactical air forces. The advanced precision strike regime empowers a synergistic combination of indirect and direct fire support at longer ranges supported by information enhanced command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems. Against this enriched environment for long-range and accurate firepower, defenses must be smarter, faster, and multi-layered for redundancy.

For the United States’ Allies in Europe and Asia, regional adversaries pose a credible threat of nuclear and conventional first strike within minutes, which deprives the other side of unambiguous warning and accurate attack characterization. The avoidance of these regional nuclear wars may rise to the gold standard of deterrence for the first half of this century. In the current political environment, technologies for “theater” or regional missile defenses appeal to besieged leaders because they are a demonstration of action. This is especially the case as ballistic missile systems with advanced propulsion are becoming more survivable, reliable, mobile, and accurate—with the ability to strike targets over longer distances.<sup>32</sup>

Offenses may also evolve away from dependency on ballistic missiles as first-strike weapons. Cruise missiles offer precision-strike power from land, sea, and air launchers—and over a variety of ranges. They are armed with conventional or nuclear warheads. Cruise

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29. Merideth Roaten, “Hypersonic Threat Spurs Investment in Space-Based Missile Tracking,” *National Defense*, August 8, 2022, <https://www.nationaldefensemagazine.org/>.

30. David Vergun, “General Says Countering Hypersonic Weapons Is Imperative,” DoD, May 10, 2023, <https://www.defense.gov/>.

31. Emmanuelle Maitre, “Arms Control and Delivery Vehicles: Challenges and Ways Forward,” *Journal for Peace and Nuclear Disarmament* 5, no. 1 (2022); and Waheguru Pal Singh, “Why Missile Proliferation Is So Hard to Stop,” *Bulletin of the Atomic Scientists*, June 28, 2016, <https://thebulletin.org/>.

32. Hensley et al., “Understanding the Indications”; and see also Jacob L. Heim, “The Iranian Missile Threat to Air Bases: A Distant Second to China’s Conventional Deterrent,” *Air & Space Power Journal* 29, no. 4 (July–August 2015), <https://www.airuniversity.af.edu/>.

missiles are highly survivable against ballistic missile attack, making states less dependent on the “use or lose” dilemma. They only require the mastery of first-generation information age technology.

Although viewed as second-strike weapons in many nuclear scenarios, conventional cruise missiles demonstrate their potential for prompt first strike. The United States uses cruise missiles to good effect in wartime, in punitive reprisals, and in coercive diplomacy. Such use began in the first Gulf War (1991) and continues to the present.<sup>33</sup> Future American conventional prompt global-strike weapons may include hypersonic weapons capable of speeds between five and fifteen times the speed of sound, but with increased accuracy.<sup>34</sup>

Cruise missile technology may be employed to adjust the intended flight pattern of ballistic missiles. This tactic is designed to complicate the task of the defender’s BMD systems. Whether such a hybrid missile or a ballistic missile with a hypersonic glide vehicle can adapt in flight to the defender’s tactics is a complicated command-and-control problem.

As noted, Putin and other Russian officials assert that no American missile defenses are permitted to override Russia’s nuclear deterrent. Putin specifically refers to Russian technology that allows ballistic missiles to maneuver in flight. It is not entirely clear from these references whether it is the missiles themselves or the re-entry vehicle that maneuvers in response to defensive interceptors.<sup>35</sup> Maneuverable warheads are not a new technology, but interest may increase if missile defenses are deployed in significant numbers.

Russia has also indicated its plans to place greater emphasis on its own air and missile defense forces, even as it continues to express doubts about the intentions of the United States and NATO in this regard. For example, then-Russian Defense Minister Sergei Shoigu announced in August 2015 the creation of the Russian Aerospace Forces, bringing under a single command Russia’s air force and its aerospace defense forces. According to Shoigu, “Air forces, anti-air, and anti-missile defenses, and space forces will now be under a unified command structure.”<sup>36</sup>

Some experts said the reorganization was at least a partial reaction to the perceived risk of NATO attacks against Russia, including those based on prompt global-strike weapons.<sup>37</sup> Others point to both technical and management obstacles in standing up and operating the new command, including rivalries among generals for new ranks and positions.<sup>38</sup>

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33. Jonathan Beale and Jacqueline Howard, “What We Know about Strikes on Houthis and Strategy behind Them,” BBC, January 12, 2024, <https://www.bbc.com/>.

34. Robert Beckhusen, “Russia’s Future Air Force Could Resemble . . . The US Air Force,” Medium, January 2, 2015, <https://medium.com/>.

35. See Richard Weitz, *Russian-American Security Cooperation after St. Petersburg: Challenges and Opportunities* (Carlisle, PA: Strategic Studies Institute, 2007).

36. Matthew Bodner, “Russian Military Merges Air Force and Space Command,” *Moscow Times*, August 3, 2015, <https://www.themoscowtimes.com/>.

37. Franz-Stefan Gady, “Russia Creates Powerful New Military Branch to Counter NATO,” *Diplomat*, August 7, 2015, <https://thediplomat.com/>.

38. Alexander Golts, “Russia’s Aerospace Forces Will Never Take Off,” *Moscow Times*, August 10, 2015, <https://www.themoscowtimes.com/>.



Interest in BMD technologies is as likely driven by political threat perceptions as it is the product of “eureka” moments in research laboratories. One of the principal dangers of nuclear weapons spread in Asia is that it could generate a reciprocal arms race in missile defenses, followed by an escalated competition in offenses, and so on. Although experts focus on the dangers of a quantitative arms race in Asia and the Middle East, the threat of a qualitative arms race is equally or more dangerous.

Absent controls over regional nuclear proliferation, the appeal of BMD against missiles of short- or medium-ranges will grow. Both Russia’s war in Ukraine and Israel’s war against Hamas offer important lessons in this area.<sup>39</sup> The real reassurance that these theater missile defenses provide shape both the offensive and defensive use of ballistic and cruise missiles, as well as drones. The interactions between those states building offensive capabilities and those building defensive capabilities are dynamic and often have second- and third-order consequences beyond the parties involved—often pulling the United States into the defense of an ally or friend.

### **Caveats and Conundrums**

All models of nuclear warfare are subjective, regardless of their pretensions to objectivity. In addition to the battlefield use of nuclear weapons in conflict, nuclear “warfare” can also include the “use” of nuclear weapons for the purpose of avoiding strategic war by means of deterrence. Following Carl von Clausewitz’s advice, the strategist must acknowledge that all weapons have purposes dictated by state policy. In the hands of rational decisionmakers nuclear strike is not a preference.<sup>40</sup>

The exact political conditions under which a two-sided or multisided nuclear war might start are numerous and unpredictable. Once the door is opened to nuclear first use and retaliation, the admonitions of Clausewitz about the environment of war—characterized by uncertainty, friction, and chance—apply even more than they do to conventional war.<sup>41</sup>

These cautions about nuclear force exchange modeling are especially apropos when defenses are entered into the equation. The most interesting and perhaps effective defenses, from the standpoint of military-strategic effectiveness, have yet to be invented. Projections of future defense capabilities are limited to what is in development and the “what if,” which is best represented as a spectrum of possibilities. The capabilities of offensive forces are comparatively well known because of extensive testing and field deployment. On the other

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39. Carl Rehberg, “Integrated Air and Missile Defense: Early Lessons from the Russia-Ukraine War,” 1945 [website], June 10, 2022, <https://www.19fortyfive.com/>; Jacob Nagel and Shachar Shohat, “Iron Dome Developers Set the Record Straight on Its Evolution,” *Jerusalem Post*, April 8, 2021, <https://www.jpost.com/>; and Yohah Jeremy Bob, “From North to South, These Iron Dome Teams Allowed Israel to Control the Pace of War,” *Jerusalem Post*, February 18, 2024, <https://www.jpost.com/>.

40. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984).

41. Stephen J. Cimbala, *Clausewitz and Escalation: Classical Perspective on Nuclear Strategy* (London: Routledge, 2014), 8–12.

hand, no one knows exactly how offenses and defenses will interact regarding the performance of weapons in combat. Antiballistic tests, for example, have a mixed record that make it difficult to project their success in conflict.<sup>42</sup>

As to the fear policymakers must address in a Hobbesian international system—and to paraphrase Leon Trotsky—you may not be interested in nuclear targeting, but nuclear targeting is interested in you. This is the danger of nuclear proliferation. With more international actors possessing nuclear weapons, there is the possibility of nuclear first use increasing. Yet, it is also equally possible that the acquisition of nuclear arms leads to greater conservatism and more risk aversion.<sup>43</sup> The exact instances in which the former or the latter is true are unsettled.

Another ambiguity regarding offense-defense interactions is that once defenses pass a certain threshold of capability relative to offenses, defenses become potentially first-strike weapons. For example, antimissile defenses, based in space and capable of neutralizing another state's early warning and communications satellites, would be a logical part of an enhanced nuclear first-strike capability. In this case, space-based BMD would behave as an antisatellite (ASAT) weapon engaged in precursor attacks before ballistic missiles are launched or arrive at their intended targets. In response to such a deployment of space-based BMD-ASATs by one state, an adversary might deploy space-based defensive anti-satellite weapons to neutralize the ASATs of the provocateur.

In addition to the kinetic effects that might occur during offensive-defensive attacks, there are also what one military analyst calls nonkinetic technologies:

Most non-kinetic threats—or the NKT spectrum—consist of silent, largely undetectable technologies capable of inflicting damaging, debilitating, and degrading physical and neural effects on its unwitting targets. This covert threat is best understood as something to be invoked via rapid surprise attack or as a stealthy forerunner to a massive kinetic follow-on attack.<sup>44</sup>

Unfortunately for military planners, the effectiveness of antimissile defenses—particularly those targeting missiles more advanced than those fired at Israel by Hamas, Hezbollah, and Iran—is difficult to know until they are employed in battle. The United States' Patriot Missile Defense System has the most extensive history of use in combat, which is one of improving success.<sup>45</sup>

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42. "US Ballistic Missile Defense," Center for Arms Control and Nonproliferation, June 12, 2023, <https://armscontrolcenter.org/>; and Kelley M. Saylor, *Defense Primer: Ballistic Missile Defense*, In Focus 10541 (Washington, DC: CRS, updated January 30, 2024), <https://crsreports.congress.gov/>.

43. Nuno P. Monteiro and Alexandre Debs, "The Strategic Logic of Nuclear Proliferation," *International Security* 39, no. 2 (2014).

44. Robert McCreight, "444. Non-Kinetic Threats and the Threshold Spectrum of Strategic Endgame Warnings," *Mad Scientist Laboratory*, May 11, 2023, <https://madsclublog.tradoc.army.mil/>.

45. Missile Defense Project, "Patriot," Missile Threat, Center for Strategic & International Studies [CSIS], August 23, 2023, <https://missilethreat.csis.org/>.

Within the next decade, neither Russia nor the United States will likely prove capable of deploying defenses that nullify the greater portion of an adversary's nuclear deterrent. Indeed, their research and development bureaucracies and associated industries are unlikely to deploy missile defenses that can bend the curve even modestly. In other words, against realistic—although not necessarily realizable—defenses in the next decade or so, both Russia and the United States can remain confident that their retaliatory forces perform the assured retaliation or “assured destruction” mission of inflicting unacceptable societal damage. In addition, they will retain some additional weapons for attacks on the other side's retaliatory forces, other military targets, and value targets.

So why consider deploying defenses at all? Defenses perform more than one function. They can provide additional deterrence by increasing the number of Russian or American warheads needed to destroy the other's ICBM force, which increases the cost side of a cost-benefit calculus.<sup>46</sup> As one ballistic missile defense study notes, “The defenses don't even have to work very well; the uncertainty that they might work, or could become more capable in the future, are enough to trigger the effect.”<sup>47</sup> Again, it is all about shaping the perception of an adversary that a strike may be less successful than hoped—or unsuccessful altogether.

Missile defenses can also serve to deny a rogue state the option of causing unacceptable first-strike damage to American or Russian territory. Under conditions such that deterrence might fail no matter how reliable American or Russian second-strike capability might be, defenses can provide insurance against societal damage. Of course, whether defenses are tasked with the denial of enemy objectives or as a supplement to deterrence, defenses can only partially substitute for the missions that offenses must perform. A secure nuclear second-strike capability remains the backbone of strategic nuclear deterrence.<sup>48</sup>

If Russian or American defenses are not necessarily superfluous, are they necessary? This depends more on politics than on technology. If political relations between the two states returns to a situation in which relations are not hostile and China agrees to come to the negotiating table, there is room for cooperative security measures on several fronts. This may include further reductions in operationally deployed strategic nuclear weapons and force restructuring that improves the prelaunch survivability of each nation's nuclear arsenal—reducing the advantage for pursuing a first strike. On defenses, the potential for cooperative security seems limited until a resolution to Russia's war in Ukraine is achieved.

Under better conditions, an attainable option could permit unilateral-reciprocal initiatives that limit the United States and Russia to restricted-scope national or theater missile defenses against states outside of Europe, and among the ranks of current or future nuclear powers hostile to the United States or Russia. The challenge is that those states other than Russia hostile to the United States are often supported by Russia—namely Iran. At the other end of

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46. Matt Korda and Hans M. Kristensen, “US Ballistic Missile Defenses, 2019,” *Bulletin of the Atomic Scientists* 75, no. 6 (2019), <https://doi.org/>.

47. Korda and Kristensen, 295.

48. Austin Long and Brendan Rittenhouse Green, “Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy,” *Journal of Strategic Studies* 38, no. 1 (2015), <https://doi.org/>.

the spectrum, Russia could collaborate with the United States and NATO on the development of national or theater BMD. This was President Ronald Reagan's offer with the Strategic Defense Initiative and later offered by President George W. Bush.<sup>49</sup> The Soviet Union and Russia said no. These options are far from possible in the present or in the near future.

It remains surprising that some still question whether stable nuclear deterrence between Russia and the United States is important.<sup>50</sup> The answer lies in geopolitics as related to the spread of nuclear weapons. Multilateral security in Asia and in Europe is simply inconceivable without bilateral political and military security, including both stable deterrence and reassurance, as between the United States and Russia, and soon, China.

The containment of nuclear proliferation in Asia and the return to a debellitized Europe require an end to the conflict in Ukraine and Russia's active commitment to military forbearance. Russia is a necessary, if always inconvenient, security partner for the United States and NATO—for selfish as well as for altruistic reasons in Washington and in Brussels.

## Conclusions

The Cold War and immediate post-Cold War experience of the United States with nationwide missile defenses was a potlatch of limited research and development resulting in modest deployments and limited military-strategic effect until well after the Cold War. New technologies may advance the state of the art for missile defenses, especially against threats of less than intercontinental or transoceanic ranges.

On the other hand, offenses will also take advantage of new technologies for circumventing defenses, including challenges to potential space-based missile defenses or space-located supports for ballistic missile defenses; and hypersonic speeds with maneuverability allowing little time for decision making and, in some cases, forcing delegation of decisions to AI systems preprogrammed for timely responses.<sup>51</sup> There is the additional uncertainty attached to the use of nonkinetic threats before or during kinetic warfare, either by prospective attackers or defenders.

Russia's annexation of Crimea in 2014 and its war of aggression against Ukraine, as well as the Sino-Russian political alignments and military cooperation of 2022–23, remind us that geopolitical surprises have a way of detouring diplomacy and smudging military-strategic complacency.<sup>52</sup> On the other hand, the performance by Russian military forces in Ukraine during the same period shows that Russia remains somewhat

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49. Vladislav Zubok, *Collapse: The Fall of the Soviet Union* (New Haven, CT: Yale University Press, 2021).

50. Alexey Arbatov, "Nuclear Deterrence: A Guarantee or Threat to Strategic Stability?," Carnegie Russia Eurasia Center, March 22, 2019, <https://carnegieendowment.org/>.

51. Michael Depp and Paul Scharre, "Artificial Intelligence and Nuclear Stability," *War on the Rocks*, January 16, 2024, <https://warontherocks.com/>; and see also Adam Lowther and Curtis McGiffin, "America Needs a Dead Hand More Than Ever," *War on the Rocks*, March 28, 2024, <https://warontherocks.com/>.

52. Ricardo Berrios and Andrew Bowen, *China-Russia Relations*, In Focus 12100 (Washington, DC: CRS, 2023), <https://crsreports.congress.gov/>; and Dmitry Gorenburg et al., *Russian-Chinese Military Cooperation* (Arlington, VA: Center for Naval Analyses, 2023), <https://www.cna.org/>.

behind NATO in its ability to conduct modern air-land battle in high-end conventional warfare—especially in the coordination of direct and indirect long-range fires, aviation, and ground forces.<sup>53</sup>

Notwithstanding the seriousness of the current threat posed by Russia to the rules-based international order in Europe, Russia's significance as the geostrategic pivot of Eurasia remains an important marker for American policy planning. Peace in Europe and Asia requires that the United States and NATO reestablish deterrence vis-à-vis Russia. It is difficult to push forward with a cooperative security agenda regarding nonproliferation, including the safety and security of weapons and fissile materials; nuclear arms controls; and the inclusion of Russia within Euro-Atlantic security structures, including missile defenses, if Putin or his successor believes NATO is not up to the fight of defending Europe. ➔✳

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53. Zoltan Barany, "What the West Still Gets Wrong about Russia's Military," *Foreign Affairs*, September 8, 2023, <https://www.foreignaffairs.com/>; and Seth G. Jones, Alexander Palmer, and Joseph S. Bermudez Jr., "Ukraine's Offensive Operations: Shifting the Offense-Defense Balance," CSIS, June 9, 2023, <https://www.csis.org/>.

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