



Unarmed Minuteman III intercontinental ballistic missile launches during operational test, May 21, 2025, at Vandenberg Space Force Base, California (U.S. Air Force/Jack Rodriguez Escamilla)

Political Objectives, Nuclear Forces, and the Enduring Value of U.S. Intercontinental-Range Ballistic Missiles

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Intercontinental-range ballistic missiles (ICBMs), or missiles that fly over 5,500 kilometers (approximately 3,400 miles), have been a key component of the U.S. nuclear triad since the

1960s. (The other two components of the triad are submarine-launched ballistic missiles and strategic bombers.) The Minuteman III system is the only ICBM in the U.S. arsenal today. But

the system is old and challenges to its sustainability mount. The United States is planning on replacing the system in the next several decades with the Sentinel ICBM. The program will have to compete for attention and resources with other Department of War modernization priorities in the context of budgets that for years have not been commensurate with the threat that the United States and allies are facing. Despite some prominent calls for the elimination of the ICBM leg of the triad, the system is more important than ever because of threat developments and decreases in the flexibility and diversity of the U.S. nuclear arsenal since the end of the Cold War.¹ ICBMs continue to make a critical contribution to U.S. national security strategy—and will continue to do so for years to come.

Growing Threat

Threats facing the United States have played a major consideration in the development and deployment of ICBMs. Much has been written on the emergence of the tripolar nuclear environment, in which China is rapidly approaching U.S. and Russian nuclear capabilities. In 2022, then Commander of U.S. Strategic Command Admiral Charles Richard called China's nuclear expansion "breathtaking."² He stated that China "can do any plausible nuclear employment strategy regionally. This will backstop their conventional capability and will potentially constrain our options—that is, we will be the ones that are getting deterred if I don't have the capability to similarly deter them."³

Russia has been using its nuclear forces coercively to achieve its current strategic objectives, including subjugation of Ukraine; maintains an active nuclear modernization program; and has, by some unclassified estimates, a 10-to-1 advantage in nonstrategic nuclear forces.⁴ In June 2023, Vladimir Putin noted: "We have more such nuclear weapons than NATO [North Atlantic Treaty Organization] countries. They know about it and never stop trying to

persuade us to start nuclear reduction talks. Like hell we will, right? A popular phrase. Because, putting it in the dry language of economic essays, it is our competitive advantage."⁵

Russia and China are now strategic partners. Russia would not be able to prosecute its ongoing war against Ukraine at the current scale without China's support. Both countries share an objective of replacing the U.S.-led world order. Such a replacement would be to the detriment of the United States and its allies. While it may be the case that a genuine strategic alliance is beyond the interests of both countries, their alliance needs to last only long enough to diminish U.S. capabilities and influence in the Indo-Pacific region and in Europe.

North Korea is a nuclear-armed regional challenger. Pyongyang's strategic cooperation with Russia could significantly improve its missiles and nuclear warheads.⁶ Iran could have enough material for a nuclear weapon in days, although the recent Israeli and U.S. strikes may have altered the timeline for producing a deliverable nuclear weapon.⁷ These countries are particularly worrisome to U.S. allies in their respective regions. In this context, it bears mentioning that U.S. security guarantees, including nuclear guarantees, have been one of the most successful, if not the most successful, tools of U.S. nonproliferation policy. When allies can rely on the United States coming to their defense, they are less likely to develop their own independent nuclear capabilities.

U.S. adversaries are revisionist powers that use nuclear forces to advance their regional and global interests that are contrary to those of the United States. The situation is unlike the problems the United States faced during the Cold War. Then the focus was on deterring the Soviet Union, a single nuclear-armed adversary, with an underlying assumption that if Moscow were deterred, Beijing—with a much smaller nuclear arsenal—would also be.⁸ The triad continues to be necessary to give the Nation the flexibility and adaptability to respond to new developments.

Nuclear Forces Support Political Objectives

The U.S. nuclear triad is sometimes presented as redundant and owing its existence only to parochial fights among the Army, Navy, and Air Force, but that would be a significant mischaracterization of how the United States arrived at the current posture. Today, the Navy "owns" the seabased leg of the nuclear triad, and the Air Force owns the air- and the ground-based legs. The National Nuclear Security Administration owns the warheads. While bureaucratic infighting played a role in the development of the nuclear triad (and other nuclear forces), it is useful to discuss political goals that nuclear forces help to achieve. Requirements generated by these goals have shaped the size and attributes of U.S. nuclear forces over time and will continue to do so.

The first and foremost political goal is to deter a large-scale attack, nuclear or conventional, against the U.S. homeland.⁹ More than 40 years ago, the Scowcroft Commission noted: "Deterrence is not, and cannot be, bluff. For deterrence to be effective we must not merely have weapons, we must be perceived to be able, and prepared, if necessary, to use them effectively against the key elements of [an enemy's] power."¹⁰

U.S. adversaries demonstrably do not share the same values as the United States: appreciation for human life and emphasis on economic prosperity for the citizenry (rather than for the select few of the regime). Contrary to the popular belief, the United States does not deliberately target cities to maximize casualties.¹¹ Since the mid-1970s, U.S. leaders have understood that a deliberate threat against populations lacks credibility and desired deterrence effect, let alone being completely against U.S. values and Just War principles. ICBMs enable the United States to hold at risk credibly and promptly what the adversaries value most—their tools of external aggression and internal oppression.

Because ICBMs are dispersed over five U.S. states, there is no simple way for an adversary to destroy them. An attack on U.S. ICBM fields would be a clear



declaration of war against the United States. An adversary would have to use many of its own warheads against U.S. ICBM fields, thus minimizing the relative damage to the rest of the country. The difference in casualties could be in the

millions by some accounts.¹² A hypothetical nuclear exchange between Russia and the United States could result in 75 million casualties.¹³ Should the ICBM leg be eliminated, the number could rise to 125 million, according to some calculations.¹⁴

ICBMs create an extremely high barrier to a first-strike attack, not only because of the other legs of the triad but also because ICBMs are designed to withstand such an attack and be available for retaliation, if needed.

Air Force and Northrop Grumman conduct full-scale qualification static fire test of Sentinel intercontinental ballistic missile stage-one solid rocket motor at Northrop Grumman's facility in Promontory, Utah, March 6, 2025 (U.S. Air Force/Nial Bradshaw)



The second important political objective is assurance of U.S. allies. Even here, ICBMs have played an ever more important role because of reductions in U.S. forward-deployed nuclear forces since the end of the Cold War. Strong strategic

deterrence means the United States is more likely to intervene on behalf of an ally facing a nuclear-armed adversary. Reductions in U.S. nuclear forces since the end of the Cold War, combined with vulnerability of the U.S. homeland to

long-range missiles, have resulted in a situation in which U.S. assurances are likely perceived as less credible.¹⁵

The third important political goal is achieving U.S. objectives should deterrence fail. The authoritarian nature of

U.S. adversaries means they value tools of internal oppression to keep the current elites in power. Their desire to change the international status quo means they prize tools of external attack, including their conventional and nuclear forces. Of these, nuclear forces are particularly important because of their destructive potential. Holding promptly and reliably at risk the key targets that adversaries value generally requires nuclear weapons. Doing so quickly and precisely demands ICBMs. These weapons played a unique role in this mission throughout most of the Cold War because it was not until the 1980s that U.S. sea-launched missiles acquired a similar precision (and therefore capability against hardened targets) to that of the ICBM force.

ICBMs remain the most responsive leg of the nuclear triad and can reach any target in the world in less than 30 minutes. They are always on alert and can be launched within minutes of a Presidential decision to do so. This degree of responsiveness currently does not occur in the bomber leg of the triad and may not always be present right when the U.S. President needs it in the submarine leg of the triad.¹⁶ Some opponents argue that this “hair trigger” alert is more likely to involve the United States in an accidental war, but the United States maintains a robust redundant command and control network.¹⁷ This network needs to be modernized along with the new delivery systems.

An ICBM can be launched only “upon receipt of an authenticated, encrypted, and securely transmitted order from the President of the United States.”¹⁸ The risk of an accidental launch is minimal, and in any event, U.S. ICBMs are targeted on open ocean areas, not at other countries. The usual proposed solution to this not-real problem is *de-alerting*—making them less than launch-ready. This would strip ICBMs of responsiveness, one of their most important attributes, which is why all administrations have rejected the idea. Moreover, because ICBMs are always on alert, there is no need for potentially destabilizing posture changes during times of heightened tensions.

The fourth important political objective is contributing to the capacity to hedge against an uncertain future. ICBMs force adversaries to disperse their efforts to counter U.S. strategic systems. If this leg of the nuclear triad were to be eliminated, an adversary could apply all its resources to defeating the triad’s seabased leg, which would be its next difficult problem to solve. Bombers are not on alert anymore, so the United States effectively has a dyad for day-to-day operations. As General Larry D. Welch stated, “Neither effort is worth the cost and risk for the adversary so long as the ICBM force is constantly ready.”¹⁹ ICBMs can also carry up to three warheads each, and this upload capability becomes more important in light of Russia’s and China’s modernization and force increases and the U.S. inability to produce new nuclear warheads in the near term.²⁰ It is also worth mentioning that if the United States unilaterally reduces its ICBM leg of the triad, or any nuclear forces for that matter, any potential future equitable arms control will be more difficult to achieve.²¹

Evolution of the Program

ICBMs were primarily conceived of as a cheaper way to deliver destruction relative to bombers. They are still the cheapest leg of the nuclear triad to operate. They are also a testament to the fact that the United States can go fast, if needed. Only 4 years passed between the setup of the Western Development Division—the Air Force’s management group created to develop an ICBM—and the launch of the first U.S. ICBM. The second and third generations of the system were developed within 3 years after that.²² It took prioritization on the part of the Department of Defense and the White House, and “reporting access to the Pentagon’s senior leadership on all decisions related to the overall direction of the program.”²³ The current program manager for the Sentinel system must be green with envy. The Sentinel’s first developmental flight test has been delayed from 2023 to 2026, and in 2024 the program triggered the Nunn-McCurdy Act review for critically breaching its cost projections.²⁴

The survivability of the nuclear force is a key requirement for deterrence. One of the rationales for the development of ICBMs in the 1950s was the vulnerability of bombers to a Soviet nuclear attack, since the Strategic Air Command parked them in the open. Ukraine’s recent attack on Russia’s strategic bombers illustrates not only this continued vulnerability but also the difficulties in responding to a significant portion of a nuclear triad’s air-based leg being destroyed by (fairly cheap) conventional means.²⁵

ICBMs and sea-launched ballistic missiles continue to have an unquestionable advantage over bombers in this regard, particularly because bombers no longer carry nuclear weapons during day-to-day operations and because of the development in adversary air defense capabilities. Bombers cannot always penetrate defenses, and ensuring they do is too costly given their other mission demands. Moreover, unlike ICBMs, bombers and submarines can be destroyed by conventional weapons, thus generating possible ambiguity about an adversary’s intentions.

The decline of the U.S. nuclear enterprise will one day make an excellent case study in strategic shortsightedness. The Minuteman III system was designed for 10 years of service life and entered the force in 1970. It is currently deployed with the W78 and W87 warheads.²⁶ The 1970s and 1980s debates regarding basing of a follow-on missile that eventually became the MX Peacekeeper indicated concerns over the Minuteman’s survivability, yet the United States is still deploying it 40 years later. The system has been upgraded and its service life extended, but it is still the same system. Some argue the United States should continue to extend its life, just long enough for national security conditions to improve so Washington can get rid of it.²⁷ Yet Admiral Richard was clear that further extending the Minuteman III system is not cost-effective and is, in fact, quickly becoming impossible because “in some cases, the drawings don’t exist anymore, or where we have drawings, they’re like six generations behind the industry standard.”²⁸ Counting on future national security conditions to improve is



Airman 1st Class Aiden Williams, 90th Missile Maintenance Squadron boardman, climbs onto maintenance platform to enter launch tube during guided missile maintenance platform installation at F.E. Warren Air Force Base, Wyoming, July 9, 2025 (U.S. Air Force/Michael A. Richmond)

imprudent, particularly when recent trends suggest the exact opposite.

The United States scaled back and then stopped nuclear weapons modernization after the end of the Cold War in expectations of a benign national security environment. This assumed

that Washington could depend on international organizations to help it confront major challenges and that “global governance” would emerge with the help of American leadership. . . . That view presumed that since other countries were progressing inexorably toward liberal democracy, they would share many of Washington’s goals and would play by Washington’s rules.²⁹

The expectation was false, and now the United States finds itself with a much smaller, less diverse, and increasingly aged nuclear weapons systems and an infrastructure that cannot respond to unanticipated developments in any sort of flexible and resilient manner.

Enduring Value

If the United States eliminated the ICBM leg of the nuclear triad, the number of warheads required to attack nuclear weapons–related infrastructure and military bases on the U.S. homeland shrinks from hundreds to a handful. That knowledge could embolden our adversaries not just in strategic scenarios but also in regional

conflicts. In conflicts between nuclear-armed adversaries, states with larger arsenals are generally more successful in achieving their objectives during high-stakes crises.³⁰

The Sentinel program’s challenges are not a commentary on futility of the ICBM leg of the triad; rather, they are a commentary on a nation that became too comfortable with its post–Cold War status. The feeling of safety, and its accompanying lack of urgency, prevails against reason. The post–Cold War optimism was a baseline for recommending that the United States (yet again) extend the life of the Minuteman III system rather than replace it altogether and then work with Russia on arms control

measures to eliminate the ICBM leg of the triad.³¹ These arguments ring hollow after Russia's aggressions, most recently against Ukraine; its extensive nuclear modernization; its arms control violations; and China's nuclear buildup and revisionist global agenda.

The Sentinel program is currently behind schedule and over budget and is undergoing a review.³² The Air Force is planning on 400 deployed Sentinel missiles, but this requirement could change since it rests on a rather optimistic assessment of the national security environment during the time when the New Strategic Arms Reduction Treaty was negotiated.³³ After all, the system is supposed to be in service at least until 2080. That would be like the difference between about 1970 and today. Considering that time frame, one can easily perceive how different conditions can be under which a system must remain effective in the future.

Why Does the United States Maintain a Triad?

While each of the nuclear triad legs are complementary, more important is that the triad compels an adversary to disperse its investments, preparation, and attention.³⁴ For example, investments into antisubmarine warfare would become much more interesting and have potentially higher payoff if ICBMs were eliminated. Bombers are vulnerable already, and the United States cannot currently be on continuous air alert without breaking the force within a few months. A more diverse set of forces would be inherently more stable than a diminished one.

The U.S. nuclear triad is the crown jewel of U.S. forces in strategic terms—and will continue to be so in the future. It is a visible demonstration that can help to influence an adversary's calculus and deter actions against U.S. strategic interests. It is also an essential enabler for U.S. conventional forces. Admiral Richard stated: "Every operational plan in the Department of Defense, and every other capability we have in DOD, rests on the assumption that strategic deterrence . . . is holding right."³⁵

The current U.S. nuclear force posture reflects the optimism of the early 1990s. Yet forces the United States considered sufficient in the 1990s and early 2000s are unlikely to suffice now or in the future, given that its adversaries are modernizing. As Admiral Richard argued:

We have a triad . . . in part because of the flexibility it provides, the ability to hedge inside of it . . . [W]hat it also enables you to do is address the threat or the risks you didn't see coming. We always built margin into our strategic forces to make sure that we could account for the unknown risks that may be out there alongside the risk that we could reasonably see.³⁶

More broadly, eliminating a leg of a nuclear triad now when adversaries are doubling down on modernization would send a signal that the United States is ceding the competition in this area to them. That would likely mean more aggression against U.S. and allied interests, more global instability, and consequently less economic prosperity.

As the United States is planning its force posture modernization, it must consider adversary forces and goals and what the President can threaten with U.S. nuclear forces to frustrate them. The decrease in the diversity and number of U.S. nuclear forces is a problem—and a difficult path lies ahead in trying to repair it. It begins with the recapitalization of the U.S. nuclear enterprise, including the laboratories, so they can build new nuclear warheads and be more flexible and agile in the face of dangerous national security trends.

Eight former commanders of U.S. Strategic Command wrote in 2017 that the "combined capabilities of the triad provide the [P]resident with the mixture of systems and weapons necessary to hold an adversary's most valuable targets at risk, with the credibility of an assured response if needed—the essence of deterrence."³⁷ The United States simply must maintain its strategic nuclear triad into the future. There is no substitute for ICBMs within that force, and reducing the ICBM leg of the nuclear triad will leave the United States and its allies less safe. JFQ

Notes

¹ William J. Perry, "Why It's Safe to Scrap America's ICBMs," *New York Times*, September 30, 2016, <https://www.nytimes.com/2016/09/30/opinion/why-its-safe-to-scrap-americas-icbms.html>; William J. Perry and James E. Cartwright, "Spending Less on Nuclear Weapons Could Actually Make Us Safer," *Washington Post*, November 16, 2017, https://www.washingtonpost.com/opinions/spending-less-on-nuclear-weapons-could-actually-make-us-safer/2017/11/16/396ef0c6-ca56-11e7-aa96-54417592cf72_story.html.

² Statement of Charles A. Richard, Commander, U.S. Strategic Command, Before the Senate Armed Services Committee, March 8, 2022, 2, <https://www.armed-services.senate.gov/imo/media/doc/2022%20USSTRATCOM%20Posture%20Statement%20-%20ASAC%20Hrg%20FINAL.pdf>.

³ Quoted in Jamie McIntyre, "'We Will Be the Ones Deterred': STRATCOM Commander on China's 'Breathtaking' Nuclear Buildup," *Washington Examiner*, April 23, 2021, <https://www.washingtonexaminer.com/policy/defense-national-security/we-will-be-the-ones-deterred-stratcom-commander-on-chinas-breathtaking-nuclear-buildup>.

⁴ Michaela Dodge, *What Do Russia's Nuclear Threats Tell Us About Arms Control Prospects?* Information Series No. 564 (Fairfax, VA: National Institute Press, October 2023), https://nipp.org/information_series/michaela-dodge-what-do-russias-nuclear-threats-tell-us-about-arms-control-prospects-no-564-october-2-2023/.

⁵ Vladimir Putin, "Remarks at the Plenary Session of the St. Petersburg International Economic Forum," June 16, 2023, <http://en.kremlin.ru/events/president/news/71445>.

⁶ Quoted in Anthony Kuhn, "Concerns Mount as Russia and North Korea Commit to a Mutual Defense Pact," NPR, June 20, 2024, <https://www.npr.org/2024/06/20/nx-s1-5011604/leaders-of-russia-and-north-korea-sign-pact-indicating-a-deeper-cooperation>.

⁷ Statement of General Anthony J. Cotton, Commander, United States Strategic Command, Before the Subcommittee on Strategic Forces, Senate Armed Services Committee, March 26, 2025, 6, https://www.armed-services.senate.gov/imo/media/doc/testimony_of_general_anthony_jcotton1.pdf; Rob Picheta and Thomas Bordeaux, "Israel's Strikes Zeroed in on Iran's Nuclear Program. How Much Damage Was Done?" CNN, June 16, 2025, <https://www.cnn.com/2025/06/14/middleeast/iran-israel-nuclear-facilities-damage-impact-intl>; Geoff Brumfiel et al., "Obliterated? Damaged? Inoperable? What's Known About Iran's Nuclear Facilities," NPR, June 26, 2025, <https://www.npr.org/2025/06/26/nx-s1-5443666/obliterated-damaged-inoperable-iran-nuclear-facilities>.

⁸ Keith B. Payne, *Why Rebuild the Triad? Because a Nuclear War Cannot Be Won and Must Never Be Fought*, Information Series No. 488 (Fairfax, VA: National Institute Press, May 2021), https://nipp.org/information_series/keith-b-payne-why-rebuild-the-triad-because-a-nuclear-war-cannot-be-won-and-must-never-be-fought-no-488-may-4-2021/.

⁹ The three political objectives listed here are taken from the *2018 Nuclear Posture Review* (Washington, DC: Department of Defense, February 2018), 3, <https://media.defense.gov/2018/feb/02/2001872877/-1/-1/1/executive-summary.pdf>. These objectives have been consistent across administrations.

¹⁰ *Report of the President's Commission on Strategic Forces* [Scowcroft Commission] (Washington, DC: Department of Defense, April 1983), 2–3, <https://web.mit.edu/chemistry/deutch/policy/1983-ReportPresCommStrategic.pdf>.

¹¹ David Trachtenberg, *Mischaracterizing U.S. Nuclear Deterrence Policy: The Myth of Deliberate Civilian Targeting*, Information Series No. 542 (Fairfax, VA: National Institute Press, December 2022), https://nipp.org/information_series/david-j-trachtenberg-mischaracterizing-u-s-nuclear-deterrence-policy-the-myth-of-deliberate-civilian-targeting-no-542-december-14-2022/.

¹² Matthew Kroenig, “The Case for the U.S. ICBM Force,” *Strategic Studies Quarterly* 12, no. 3 (2018), https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-12_Issue-3/Kroenig.pdf.

¹³ Kroenig, “The Case for the U.S. ICBM Force,” 61.

¹⁴ Kroenig, “The Case for the U.S. ICBM Force.”

¹⁵ Keith B. Payne, *Arms Control: Past Practices Threaten Extended Deterrence Today*, Information Series No. 594 (Fairfax, VA: National Institute Press, July 2024), https://nipp.org/information_series/keith-b-payne-arms-control-past-practices-threaten-extended-deterrence-today-no-594-july-16-2024/.

¹⁶ C. Donald Alston, *Open Letter to the Commander-in-Chief: Deterrence and the ICBM—A Practitioner's Perspective* (Vienna, VA: Potomac Foundation, 2017), 7, <https://alstonstrategicconsulting.wordpress.com/wp-content/uploads/2017/11/deterrence-and-the-icbm-alston-nov-17-tpf.pdf>.

¹⁷ See, for example, William J. Perry and James E. Cartwright, “Letter From William J. Perry and James E. Cartwright to President Trump,” *Ploughshares*, October 31, 2017, <https://web.archive.org/web/20240914032027/https://ploughshares.org/print/letter-william-j-perry-and-james-e-cartwright-president-trump>; Bruce G. Blair et al., *The End of Nuclear Warfighting: Moving to a Deterrence-Only Posture* (Washington, DC: Global Zero, September 2018), 32–33, 81, <https://www.globalzero.org/wp-content/uploads/2018/09/ANPR-Final.pdf>;

Global Zero U.S. Nuclear Policy Commission Report: Modernizing U.S. Nuclear Strategy, Force Structure, and Posture (Washington, DC: Global Zero, May 2012), https://www.globalzero.org/wp-content/uploads/2018/09/gz_us_nuclear_policy_commission_report.pdf.

¹⁸ Department of State, “U.S. Nuclear Force Posture and De-Alerting,” fact sheet, December 14, 2015, <https://2009-2017.state.gov/t/avc/rls/250644.htm>.

¹⁹ *Conversations on National Security: Part One, General Larry D. Welch (USAF, Ret.)*, Information Series No. 491 (Fairfax, VA: National Institute Press, June 2021), https://nipp.org/information_series/conversations-on-national-security-part-one-general-larry-d-welch-usaf-ret-no-491-june-3-2021/.

²⁰ Mark B. Schneider and Keith B. Payne, *Deterrence Requirements and Low-Cost Nuclear Upload Options*, Information Series No. 626 (Fairfax, VA: National Institute Press, June 2025), https://nipp.org/information_series/keith-b-payne-and-mark-b-schneider-deterrence-requirements-and-low-cost-nuclear-upload-options-no-626-june-5-2025/.

²¹ Matthew R. Costlow, *Unilaterally Cutting U.S. ICBMs Would Undermine Prospects for Arms Control*, Information Series No. 435 (Fairfax, VA: National Institute Press, December 2018), https://nipp.org/information_series/costlow-matthew-r-unilaterally-cutting-u-s-icbms-would-undermine-prospects-for-arms-control-information-series-no-435/#_edn4.

²² Peppi DeBiao, “Building a Golden Dome: Lessons From the 1950s,” Center for International and Strategic Studies, May 12, 2024, <https://www.csis.org/analysis/building-golden-dome-lessons-1950s>.

²³ DeBiao, “Building a Golden Dome.”

²⁴ Amy F. Woolf, *Defense Primer: LGM-35A Sentinel Intercontinental Ballistic Missile*, IF11681 (Washington, DC: Congressional Research Service, last updated August 7, 2025), <https://www.congress.gov/crs-product/IF11681>.

²⁵ Paul Brown and Thomas Spencer, “How Satellite Images Show Scale of Ukraine's Drone Attack on Russian Bombers,” BBC, June 4, 2025, <https://www.bbc.com/news/articles/cvg9zdxwk29o>.

²⁶ *Nuclear Matters Handbook 2020* (Washington, DC: Department of Defense, 2020), <https://www.acq.osd.mil/ncbdp/nm/NMHB2020rev/chapters/chapter4.html>.

²⁷ Garrett Hinck and Pranay Vaddi, “Setting a Course Away From the Intercontinental Ballistic Missile,” *War on the Rocks*, February 16, 2021, <https://warontherocks.com/2021/02/setting-a-course-away-from-the-intercontinental-ballistic-missile/>.

²⁸ Brian W. Everstine, “STRATCOM Welcomes Nuke Review, but Says Minuteman III Life Extension Should Not Be Considered,” *Air Force Magazine*, January

5, 2021, <https://www.airandspaceforces.com/stratcom-welcomes-nuke-review-but-minuteman-iii-life-extension-should-not-be-considered/>.

²⁹ Nadia Schadow, “The End of American Illusion,” *Foreign Affairs* 99, no. 5 (2020), 37, <https://www.foreignaffairs.com/articles/americas/2020-08-11/end-american-illusion>.

³⁰ Matthew Kroenig, *The Logic of American Nuclear Strategy: Why Strategic Superiority Matters* (New York: Oxford University Press, 2018).

³¹ Hinck and Vaddi, “Setting a Course Away From the Intercontinental Ballistic Missile.”

³² Government Accountability Office (GAO), *Weapon Systems Annual Assessment: DOD Leaders Should Ensure That Newer Programs Are Structured for Speed and Innovation*, GAO-25-107569 (Washington, DC: GAO, June 2025), 80, <https://www.gao.gov/assets/gao-25-107569.pdf>.

³³ See the discussion in Keith B. Payne and John S. Foster, Jr., *A New Nuclear Review for a New Age* (Fairfax, VA: National Institute Press, 2017), 22, <https://nipp.org/wp-content/uploads/2021/03/A-New-Nuclear-Review-final.pdf>.

³⁴ Colin S. Gray, “The Strategic Forces Triad: End of the Road?” *Foreign Affairs* 56, no. 4 (1978), 784, <https://www.jstor.org/stable/20039991>.

³⁵ Quoted in Amy Hudson, “Richard Says Nuclear Deterrence Connected to All Other DOD Capabilities,” *Air Force Magazine*, May 7, 2021, <https://www.airandspaceforces.com/richard-says-nuclear-deterrence-connected-to-all-other-dod-capabilities/>.

³⁶ Quoted in David A. Deptula, “Five Persistent Misconceptions About Modernizing the U.S. ICBM Force,” *Forbes*, December 22, 2020, <https://www.forbes.com/sites/davedeptula/2020/12/22/five-persistent-misconceptions-about-modernizing-the-us-icbm-force/>.

³⁷ Robert Kehler et al., “The U.S. Nuclear Triad Needs an Upgrade,” *Wall Street Journal*, January 11, 2017, <https://www.wsj.com/articles/the-u-s-nuclear-triad-needs-an-upgrade-1484179459>.