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# Safety in Diversity: The Strategic Value of ICBMs and the GBSD in the Nuclear Triad

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**Safety in Diversity:  
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the GBSD in the Nuclear Triad**

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## Executive Summary

The United States first introduced intercontinental ballistic missiles (ICBMs) into its nuclear forces in 1959 with the Atlas D, which was subsequently replaced by Titan, and then Minuteman. In 1970, the United States deployed the first Minuteman III (MM III) ICBM and the last in 1978 – the longest serving ICBM system in U.S. history. The U.S. Air Force has extended the life of MM III multiple times, but now top civilian and military officials say that further life extension is not financially advisable, is operationally unwise, and is rapidly becoming technically infeasible. The Obama and Trump administrations both pursued a replacement for the MM III, the Ground Based Strategic Deterrent (GBSD), that will not only replace the missile itself, but upgrade physical and cybersecurity components, reduce operation and maintenance costs, and increase effectiveness in the face of growing potential adversary threats. The decision to proceed with GBSD, however, is not without controversy – not only on whether GBSD is needed right now, but whether ICBMs in general are needed at all in the U.S. nuclear arsenal.

This *Occasional Paper* examines the debate and proceeds in four parts, first, by examining the traditional missions that ICBMs uniquely contribute to in U.S. defense strategy. Second, this paper examines why GBSD is necessary for the continued success of those missions. Third, this paper considers what the consequences might be if the United States did eliminate ICBMs from its nuclear arsenal. Fourth and finally, this paper responds to some of the novel criticisms of ICBMs and GBSD, as well as critics' proposed alternatives.

ICBMs contribute uniquely to each of the four major roles that the United States assigns to its triad of nuclear forces, which also includes submarines and bombers. ICBMs contribute to the first role in U.S. defense strategy,

deterrence of nuclear and non-nuclear strategic attack, by providing a particular set of relevant characteristics, including assured connectivity, responsiveness, promptness, survivability, and difficulty to target. These attributes present a potential adversary with no good options for targeting U.S. ICBMs as it could not be sure a U.S. president would not order them to be launched under attack; but, even if the ICBMs were not launched, the potential adversary would likely have to use up to 60 percent of its intercontinental strategic arsenal to – at most – destroy less than 25 percent of the U.S. strategic arsenal.

In addition to contributing to deterrence of nuclear and non-nuclear strategic attack, U.S. ICBMs also contribute to the second primary mission for U.S. nuclear forces, assuring allies and extending deterrence. ICBMs contribute to this mission by providing the United States the freedom of action to support allies and partners abroad, secure in the knowledge that it can deter major nuclear attack on its homeland and thus be able to withstand nuclear coercion. Should deterrence fail, however, ICBMs contribute to the third mission of achieving U.S. objectives by providing targeting flexibility, scalability, and a known unique payload and trajectory that may contribute to escalation control. Finally, ICBMs contribute to hedging against geopolitical, technical, operational, and programmatic risk because the United States can upload additional warheads on ICBMs if needed, and with GBSD, more easily upgrade components with new technologies due to its modular design.

In addition to these four traditional missions, ICBMs also make three more secondary, but valuable contributions. First, they are the least costly leg of the triad to operate, maintain, and modernize. Second, GBSD's lengthy expected service life, likely to serve through 2075, provides financial value as a weapon system that can be upgraded as needed to meet the dynamic threat

environment. Finally, should U.S. leadership propose further arms control negotiations, ICBMs provide a useful counter and leverage against the ICBM-centric forces of states like Russia and China.

The second section of the paper examines the reasons why the United States is pursuing GBSD. First, U.S. military officials state that further life extension of MM III ICBMs is fiscally unwise and/or technically infeasible given the alternative of GBSD. Second, the number of available MM III ICBM bodies are dwindling to the point where the United States will not be able to field the current force levels of about 400 ICBMs at current testing rates – and decreasing testing rates while increasing the number of modifications to the missiles during a life extension program increases risk. Third, U.S. officials state that GBSD will offer a number of upgrades in physical and cyber security, a decrease in operations and maintenance costs, and greater survivability. Each of these factors combine to make U.S. selection of the GBSD option a wise investment for the future of the land-based leg of the nuclear triad.

The third section of the paper examines the potential consequences of the United States eliminating ICBMs from its nuclear arsenal, as some critics desire. Doing so, however, could increase the probability and profitability of a significant adversary attack on U.S. strategic forces, would cause severe damage to the resiliency of the U.S. nuclear force against attrition, increase unexpected costs, and increase risk to the remaining legs of the U.S. nuclear triad. Additionally, without ICBMs in the U.S. nuclear force, U.S. allies and partners would likely be less assured of U.S. commitments and could pursue their own nuclear capabilities. The United States would also have less leverage in arms control negotiations; there would be fewer options available to the president should deterrence fail; and finally, states such as Russia and China that have ICBM-centric nuclear arsenals would perceive the United States as



either weak or foolish – thus possibly increasing the risk of Russian or Chinese aggression against U.S. interests.

The fourth and final section of the paper responds to novel questions, criticisms, and alternatives that analysts have raised in the wake of the Obama and Trump administrations' decision to pursue GBSD. Arguments that U.S. ICBMs are on "hair trigger alert" with a "launch on warning" policy are without basis in fact. Arguments that presidents will face decision-making pressure while U.S. ICBMs are under attack, while true, need to be placed in the context of the other valid and perhaps more attractive options that a president will also have. Other arguments, such as ICBMs inducing preemptive attack and the triad being born of bureaucratic infighting, are illogical and irrelevant respectively. Finally, the argument that MM III should be life extended either to delay GBSD or to substitute for it has the virtue, in the best scenario, of being technically possible, but strategically such a move would invite far too much risk for far too little savings.

Perhaps the best indicator of ICBMs' strategic value is how presidents and Congresses, in different threat contexts and in control by both political parties, have continuously examined their utility and re-confirmed their importance in the U.S. strategic triad. ICBMs in general, and GBSD in particular, offer a unique set of capabilities distinct from the other legs of the triad, yet mutually reinforcing in their strengths. There is, as the late strategist Colin Gray stated, "safety in diversity" as provided by the U.S. nuclear triad – and a modernized ICBM will be an indispensable foundation.

## Introduction

As the U.S. Minuteman III intercontinental ballistic missile arsenal reaches the end of its expected service life after several broad life-extension programs, some critics are questioning the value and logic of the Obama and Trump administrations' plans to build and deploy the MM III replacement – the Ground Based Strategic Deterrent. As the GBSD program is in its relative infancy, its critics question its cost, capabilities, and overall necessity – while others advocate the complete elimination of the ICBM leg of the U.S. nuclear triad, which also includes bombers and strategic submarines (SSBNs).

The first and second parts of this paper explain the value of ICBMs in general and the GBSD program in particular. The third part of this paper examines the potential consequences if the United States eliminated its ICBMs. The fourth and final part of the paper addresses some common criticisms of ICBMs and GBSD.

## The Value of ICBMs – Their Missions and Capabilities

The United States currently has 450 Minuteman III silos – 400 operational and 50 in “warm” status without any missiles – spread out over five states, with an additional 45 launch control centers (LCCs).<sup>1</sup> First deployed in June 1970, the U.S. Air Force has conducted numerous life-extension programs for MM III ICBMs – including improvements to their propulsion and guidance systems.<sup>2</sup> Each MM III can

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<sup>1</sup> Leah Bryant, “AFNWC team supports ICBM test launch,” *Hill.AF.mil*, October 29, 2020, available at <https://www.hill.af.mil/News/Article-Display/Article/2398145/afnwc-team-supports-icbm-test-launch/>.

<sup>2</sup> Amy F. Woolf, *U.S. Strategic Nuclear Forces: Background, Developments, and Issues* (Washington, D.C.: Congressional Research Service,

carry up to three re-entry vehicles containing nuclear warheads, but they currently carry only one, to aid in keeping the United States within the limits of the New START Treaty.<sup>3</sup>

As noted in the 2018 *Nuclear Posture Review*, U.S. nuclear forces have historically had four major roles in U.S. national security strategy: deterrence of nuclear and non-nuclear strategic attack, assurance of allies and partners, achievement of U.S. objectives if deterrence fails, and the capacity to hedge against an uncertain future.<sup>4</sup> U.S. ICBMs are major contributors to each role, as is explained below.

### **ICBMs and Deterrence of Nuclear and Non-Nuclear Strategic Attack**

There is a range of plausible but extreme circumstances in which a potential adversary may decide to attack the United States, its allies, or its partners with nuclear weapons, or with non-nuclear weapons in ways that have strategic effects. In a nuclear attack, a potential adversary could employ one or a few nuclear weapons in a limited strike, conduct a larger counterforce strike against a set of U.S. military targets, or escalate all the way up to a general nuclear war strike – or execute innumerable options of differing type and intensity in between. Similarly, there is a

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December 10, 2020), pp. 13-17, available at <https://crsreports.congress.gov/product/pdf/RL/RL33640/65>.

<sup>3</sup> U.S. Department of Defense, “The Importance of the Nuclear Triad,” *Defense.gov*, November 24, 2020, available at <https://media.defense.gov/2020/Nov/24/2002541293/-1/-1/1/FACTSHEET-THE-IMPORTANCE-OF-MODERNIZING-THE-NUCLEAR-TRIAD.PDF>.

<sup>4</sup> For elaboration on each of these roles, see, U.S. Department of Defense, *Nuclear Posture Review* (Washington, D.C.: Department of Defense, 2018), pp. 20-24, available at <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.

broad range of non-nuclear strategic attack scenarios that could include, for example, large scale use of chemical or biological weapons, or perhaps a massive conventional attack that threatens to overrun a U.S. ally or partner.

ICBMs, along with the other legs of the triad, contribute to deterring these kinds of attacks by presenting a clear and credible threat of their employment – that is, the United States manifestly has the capability to employ ICBMs if necessary, thus creating a deterrent threat. Clearly U.S. ICBMs are not meant to deter all possible forms of attack, like low intensity conflict or terrorist attacks. Rather, U.S. ICBMs are meant to deter the kinds of attacks that are strategic in nature, could clearly escalate to nuclear war, or if already in a nuclear war, deter further escalation by presenting a capable response should the adversary choose not to terminate the conflict.

The primary characteristics of U.S. ICBMs that convey a capable deterrence threat against nuclear and non-nuclear strategic attack are their assured connectivity, responsiveness, promptness, in-flight survivability, and difficulty to target.

*Assured connectivity* with National Command Authorities (NCA) is a critical attribute of U.S. ICBMs, offering the “interior lines of communication” that mobile forces operating abroad do not feature. Multiple redundant forms of communication between military personnel operating ICBMs, their military commanders, and U.S. political leadership help to ensure that clear and confirmed orders are received and acted upon. As former Air Force Global Strike Command Commander Gen. Roger W. Burg writes, “... the ICBM force, like the bomber, has multiple assured communications channels (e.g., landlines, radio, satellite) with the NCA...”<sup>5</sup> A potential adversary cannot

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<sup>5</sup> Roger W. Burg, *America's Nuclear Backbone: The Value of ICBMs and the New Ground-Based Strategic Deterrent* (Washington, D.C.: The Mitchell Institute for Aerospace Studies, Air Force Association, January 2017), p.

have confidence that it could completely disrupt such communications without simultaneously conducting a large-scale attack on the ICBM fields and National Command Authorities themselves – thus contributing to deterrence of the attack in the first place.

U.S. ICBMs are *responsive* to any potential orders from NCA because they are on alert 24/7/365. Unlike bombers which must be loaded with weapons, have their air crews assembled, and then fly to or near their target, and unlike submarines which may have to adjust their depth and ready their missiles, ICBMs are essentially ready to fire when given the confirmed and authenticated order. As is discussed more below, just because the U.S. ICBM force is so responsive does not mean it is on “hair trigger alert” – a common but completely inaccurate phrase used by critics to induce undue fear of ICBM launch procedures and accidents. In reality, the officers operating in the launch control centers rigorously practice receiving and authenticating orders in a timely manner, and there are numerous redundant safeguards in place to prevent unauthorized or accidental launches.

The *promptness* of U.S. ICBMs in flight contributes to deterrence by holding at risk a potential adversary’s time-sensitive targets. The generally accepted standard flight time of an ICBM from launch to target at an intercontinental distance is about 30 minutes, which does not provide much post-launch time for a potential adversary to prepare for an incoming strike after it is detected. As the former Commander in Chief of U.S. Strategic Air Command, Gen. Russell Dougherty explained during the Cold War, “The purpose of promptness is to remove warfighting resources from Soviet control, thereby disrupting and blunting the ongoing Soviet attack and limiting damage to the U.S. and

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28, available at [https://03236830-405f-4141-9f5c-3491199c4d86.filesusr.com/ugd/a2dd91\\_f6e6d80025ba4e9a92054b97bee954b5.pdf](https://03236830-405f-4141-9f5c-3491199c4d86.filesusr.com/ugd/a2dd91_f6e6d80025ba4e9a92054b97bee954b5.pdf).

our allies.”<sup>6</sup> The ICBM’s promptness contributes to its ability to both inflict damage on an adversary, and, by doing so, limit damage to the United States – thus enhancing deterrence of an attack.

Another prized attribute of U.S. ICBMs is their *in-flight survivability*. Unlike other nuclear delivery systems such as bombers and submarines which, though very unlikely in the case of submarines, can theoretically be intercepted prior to launching their weapons, U.S. ICBMs reportedly cannot be defeated by any currently-deployed missile defense system, except perhaps the A-135 nuclear-tipped missile defense system surrounding Moscow (although it is not currently deployed in enough numbers to greatly affect the U.S. ICBM force).<sup>7</sup> While it seems likely that in the near-term MM III in-flight survivability will remain effective, the U.S. Department of Defense notes that there are a number of potential adversaries’ systems that could be effective against ICBM warheads in the mid- to long-term. In addition, the 2018 *Nuclear Posture Review* notes that the Minuteman III “... will have increasing difficulty penetrating future adversary defenses.”<sup>8</sup> Addressing this possibility, which if left unchecked could undermine U.S. deterrence capabilities, is one of the reasons why the United States is pursuing GBSD.

Perhaps the most important attribute of the U.S. ICBM force for deterrence is *the difficulty potential adversaries have in targeting it*, due to its hardened basing mode and unique command and control capabilities. As noted already, MM III ICBMs are on alert 24/7/365 – meaning they can be

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<sup>6</sup> Russell E. Dougherty, “The Value of ICBM Modernization,” *International Security*, Vol. 12, No. 2 (Fall 1987), p. 169.

<sup>7</sup> U.S. Department of Defense, “Chinese and Russian Missile Defense: Strategies and Capabilities,” *Defense.gov*, July 28, 2020, available at [https://media.defense.gov/2020/Jul/28/2002466237/-1/-1/1/CHINESE\\_RUSSIAN\\_MISSILE\\_DEFENSE\\_FACT\\_SHEET.PDF](https://media.defense.gov/2020/Jul/28/2002466237/-1/-1/1/CHINESE_RUSSIAN_MISSILE_DEFENSE_FACT_SHEET.PDF).

<sup>8</sup> U.S. Department of Defense, *Nuclear Posture Review*, op. cit., p. 46.

launched in a matter of minutes if given an authenticated order. Dispersed over five states, with 450 well-spaced and hardened silos, and 45 launch control centers, the MM III ICBM fields present nearly 500 hardened aim points that a potential adversary must identify and account for in any kind of pre-planned strike. Such a strike on that many aim points, likely using at least two nuclear warheads per target to increase the probability of a successful kill, would require an enormous – and likely very visible – mobilization of adversary forces. The visibility would be to the U.S. benefit.

On this point, it is worth quoting Gen. Roger W. Burg in full:

A strike on the US ICBM force would require an adversary to generate strategic forces by putting them on alert and would demand a large number of warheads. To take out all US ICBMs and associated launch control centers would necessitate upwards of 900 warheads, which would require two-thirds of Russia's total known missile inventory, for example. Also, US satellites would detect any attempt by Russia, or another capable adversary, to "flush," or move its mobile nuclear forces from shelters, like Russia's rail garrisoned land-based missiles. This warning from the satellites would allow the United States to place American strategic forces on higher alert, making US forces more survivable. By preparing to attack the US ICBM force, an adversary would be helping the United States to generate its own forces, thereby enabling the United States to prepare a greater retaliatory capability to use subsequent to a first strike. An adversary could only conclude that such an attack would be suicidal. US satellites would easily attribute responsibility, the

attack's origin would be obvious, and the US response would be overwhelming.<sup>9</sup>

As is discussed in greater detail below, without ICBMs in the U.S. nuclear arsenal, there would only be a handful of targets that an adversary would need to strike in order to deliver a significant blow to the U.S. nuclear arsenal: two submarine bases and three bomber bases. Even worse from a crisis stability standpoint, these five bases could likely all be attacked without any perceptible changes in Russian alert rates or force posture, or perhaps done in conjunction with a previously scheduled military exercise that incorporates alert level changes. Yet, with ICBMs in the U.S. force, there is very little chance that even large-scale Russian deception tactics could successfully hide the force generation needed to attack so many targets simultaneously.

According to the RAND Corporation, should Russia consider a large-scale nuclear attack on U.S. ICBMs, Russia would have to expend nearly 60 percent of its *total strategic nuclear arsenal* to eliminate them, which represent only approximately 25 percent of the total U.S. New START-accountable nuclear warheads.<sup>10</sup> And that is if – and only, if – the U.S. president decides to ride out an attack and not launch U.S. ICBMs before they are possibly destroyed in

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<sup>9</sup> Burg, *America's Nuclear Backbone*, op. cit., pp. 25-26.

<sup>10</sup> Lauren Caston, Robert S. Leonard, Christopher A. Mouton, Chad J. R. Ohlandt, S. Craig Moore, Raymond E. Conley, and Glen Buchan, *The Future of the U.S. Intercontinental Ballistic Missile Force* (Santa Monica, CA: RAND, 2014), p. 32, available at <https://www.rand.org/pubs/monographs/MG1210.html>.; For the percentage of U.S. warheads in the New START accountable force, see, U.S. Department of State, "New START Treaty Aggregate Numbers of Strategic Offensive Arms," *State.gov*, December 1, 2020, available at <https://www.state.gov/new-start-treaty-aggregate-numbers-of-strategic-offensive-arms-15/>.



their silos.<sup>11</sup> Should the U.S. president choose to not launch U.S. ICBMs before the Russian warheads arrive, and if the Russian attack works as intended (a valiant assumption on its own), Russia will have committed an attack on the U.S. homeland that likely killed millions of Americans, but radically shifted the historically-favored Russian metric of “correlation of forces” strongly in the U.S. favor. In short, even if completely successful, a Russian attack on U.S. ICBMs would be a Pyrrhic “victory” that would leave Russia significantly disarmed relative to the United States and still facing a devastating U.S. response – thus contributing to deterrence.

In addition, in a post-attack environment, the United States would have the majority of its nuclear forces available on SSBNs which analysts generally regard as superior technologically to Russian SSBNs – again, placing Russia in the disastrous position of being outmatched by the United States both quantitatively and qualitatively.

But Russian planners must face yet another uncertainty which contributes to deterrence – the U.S. ability to launch its ICBMs out of their silos before their possible destruction (Launch Under Attack or LUA) or to launch some fraction of its ICBMs after some number of detonations on or over ICBM fields (Launch on Impact or LOI). Should the U.S. president choose to launch some or all the U.S. ICBMs after being given confirmation from multiple space- and ground-based sensors, Russia faces the daunting prospect of expending nearly 60 percent of its *entire strategic nuclear force* on empty silos. Even worse for Russia, it will likely have killed millions of Americans, not disabled a single ICBM, or only a fraction of the U.S. force if the U.S. president had chosen LOI, all the while facing a devastating U.S. ICBM response that would likely significantly reduce Russian nuclear and broader military power.

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<sup>11</sup> Caston, Leonard, Mouton, et. al., *The Future of the U.S. Intercontinental Ballistic Missile Force*, op. cit., pp. 30-31.

Such a scenario illustrates the ability of U.S. ICBMs to frustrate even the most well-executed plans of a potential adversary. As the nuclear strategist Herman Kahn stated, “The attacker is usually not nearly so interested in hurting the defender as he is in the dual objects of achieving his military objective and escaping destruction himself.”<sup>12</sup> U.S. ICBMs thus enhance deterrence by denying an adversary’s achievement of its military objective (a “victory denial” deterrence strategy) while also presenting the threat of not allowing the adversary to escape destruction.<sup>13</sup>

It is also important to note in this regard that LUA is not primarily a tactic to save ICBMs in a nuclear warfighting scenario – it is a deterrent threat before any attack has begun. As the eminent American physicist Dr. Richard Garwin wrote, “The purpose of launch under attack or launch on impact is to *deter* attack on the ICBM force, *not* actually to save the ICBMs from destruction if they are *in fact* attacked; but these capabilities can deter attack only if they are in fact capable of ‘saving’ the ICBM force by allowing it to be launched before it is destroyed.”<sup>14</sup> The LUA capability has the added advantage, by its very existence, of potentially having a significant deterrent effect without a president even acknowledging it publicly or having to commit to it as declaratory policy – thus leaving successive leaders the flexibility they may need during a crisis for enhanced deterrent effect.

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<sup>12</sup> Herman Kahn, *Thinking About the Unthinkable* (New York: Horizon Press, 1962), p. 61.

<sup>13</sup> On the concept of a “victory denial” deterrence strategy, see Colin S. Gray, *Nuclear Strategy and National Style* (Croton-on-Hudson, NY: Hudson Institute, July 31, 1981), p. 194, available at <https://apps.dtic.mil/dtic/tr/fulltext/u2/a133216.pdf>.

<sup>14</sup> Emphasis in original. Richard Garwin, “Launch Under Attack to Redress Minuteman Vulnerability,” *International Security*, Vol. 4, No. 3 (Winter 1979-1980), p. 118.

The difficulty in targeting U.S. ICBMs also has deterrence value that extends even into the conventional realm. MM III ICBMs are the only leg of the nuclear triad that cannot currently, nor likely in the near- to mid-term, be eliminated by conventional means. While nuclear-capable bombers can be shot down and submarines can (theoretically, but currently very unlikely) be sunk at sea or (more likely) in port by conventional weapons, ICBMs in their hardened silos raise the threshold of attack to the nuclear level which may, and likely will be, far too escalatory in most plausible scenarios – thus deterring attack in the first place. In addition, U.S. bombers and submarines can be targeted without striking the U.S. homeland and perhaps without, or only with ambiguous, attribution. U.S. ICBMs, on the other hand, are only deployed in the U.S. homeland. An attack on homeland-based ICBMs would eliminate any question of the source and significance of the attack. These ICBM characteristics, imperviousness to conventional attack and being solely based in the U.S. homeland, are of great deterrent value, especially when a potential adversary may view attacks on U.S. strategic assets away from the U.S. homeland as less escalatory than attacks on the U.S. homeland itself.

What makes the problem of targeting U.S. ICBMs “intractable” is the combination of the ICBM characteristics described above (assured connectivity, responsiveness, promptness, in-flight survivability, and difficulty to target) and the daunting variables that an adversary must calculate correctly to within a very narrow range of possibilities – or risk a mostly or completely unsuccessful attack. To mention but a few of these variables, the adversary must first believe the U.S. president is likely to ride out the attack on U.S. ICBMs so they remain in their silos during the duration of the attack. Then the adversary must factor in its delivery systems’ reliability, the nuclear warheads’ reliability, and all of their performance capabilities – whether the systems

are as reliable, accurate, and destructive as testing would seem to indicate – plus the correct levels of hardening of U.S. silos and launch control centers. If any single variable diverges significantly, or a combination of variables diverge slightly, it could risk the effectiveness of the entire attack.

During the Cold War, then-Head of the Air Force Ballistic Missile Office, Gen. Aloysius G. Casey, summarized the difficulties faced by the Soviets when targeting U.S. ICBM fields: “In order for the Soviets to attack U.S. ICBMs and be certain that 85 percent of the U.S. force is eliminated, they would still face enormous technical uncertainties. For example, if the Soviets were off by 15 percent in their calculations of their own accuracy, reliability, and the capability of U.S. missiles to withstand an attack, this would reduce the expected damage to U.S. missiles from 85 percent of the force to only 50 percent.”<sup>15</sup> Although expressed at a time when both U.S. and Soviet forces were much larger, the point remains – and likely increases in importance with the smaller arsenals of today – that technical uncertainties, combined with uncertainty as to whether the United States would launch its ICBMs before being struck in their silos, produces a major deterrent effect.

In summary, ICBMs play a vital deterrent role within the nuclear triad – one that cannot be replicated by either bombers or SSBNs. ICBMs frustrate potential adversaries’ plans to obtain a better position militarily or politically after a major attack – making such a possibility nearly unthinkable. Without ICBMs, the credibility of U.S. deterrence threats could be greatly reduced, leading to an increased chance of miscalculation and perhaps even deterrence failure.

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<sup>15</sup> Summary of remarks by A. Casey, “ICBM Survivability: MX and Midgetman,” in *Strategic Force Modernization and Arms Control* (Washington, D.C.: Institute for Foreign Policy Analysis, Inc., 1986), National Security Papers #6, pp. 30-31.

## The Value of ICBMs for Assurance

The second major role ICBMs play in U.S. defense strategy is that of assuring allies and partners that the United States has the capability to extend deterrence against threats in a number of plausible but extreme circumstances.<sup>16</sup> As part of the triad of U.S. nuclear forces, ICBMs have the dual role of both assuring allies and partners that the United States is a reliable security partner and has the resources needed to defend against common threats while also extending deterrence against threats capable of nuclear and non-nuclear strategic attack. A recent prominent example of this dynamic is NATO's Brussels Summit Declaration in July 2018, which stated, "Following changes in the security environment, NATO has taken steps to ensure its nuclear deterrent capabilities remain safe, secure, and effective. As long as nuclear weapons exist, NATO will remain a nuclear alliance. The strategic forces of the Alliance, *particularly those of the United States*, are the supreme guarantee of the security of Allies."<sup>17</sup>

In addition, as part of their assurance and extended deterrence roles, U.S. ICBMs are part of the broader nuclear force that acts as a disincentive to proliferation – contributing to allied and partner security and thus minimizing or eliminating their interest in pursuing their own nuclear weapons programs. A significantly reduced or eliminated U.S. ICBM force would likely cause allies and partners to question U.S. credibility as a security partner

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<sup>16</sup> For more on this subject, see Michaela Dodge, "ICBMs and Their Importance for Allied Assurances and Security," *National Institute for Public Policy*, Information Series #475, January 12, 2021, available at <https://www.nipp.org/wp-content/uploads/2021/01/IS-475.pdf>.

<sup>17</sup> Emphasis added. North Atlantic Treaty Organization, "Brussels Summit Declaration," *NATO.int*, July 11, 2018, available at [https://www.nato.int/cps/en/natohq/official\\_texts\\_156624.htm?selectedLocale=en](https://www.nato.int/cps/en/natohq/official_texts_156624.htm?selectedLocale=en).

since more potential adversaries could inflict disproportionate damage on the U.S. nuclear arsenal if it consisted of forces based on only two submarine bases and three bomber bases.

Some critics of U.S. ICBMs may counter that submarines and bombers are adequate for assurance and extended deterrence purposes as they are mobile and can visit allies and partners, unlike ICBMs. Submarines and bombers certainly do contribute to assurance and extended deterrence, but U.S. ICBMs still provide unique characteristics that would not be available in a nuclear force that did not incorporate ICBMs.

The unique attributes of ICBMs for assurance purposes include how they contribute to deterring nuclear or non-nuclear strategic attack as well as present a flexible targeting option should deterrence fail. On deterring nuclear or non-nuclear strategic attack, if U.S. allies or partners are attacked by states like Russia, China, or North Korea, and the United States joins the conflict, those states will know that they cannot hope to disable the broader U.S. nuclear force without attacking the U.S. homeland and risking consequences that would far outweigh any benefits. In short, if allies and partners know that the United States can credibly deter massive attack on its homeland, they may be more likely to consider the United States a reliable partner that can contribute to their own security – especially in a crisis or wartime situation.

If the U.S. nuclear force only retained submarines and bombers, then even more states – beyond just Russia currently – could threaten significant relative damage to the U.S. nuclear force. For example, North Korea could make advances in its ICBM technology and perhaps credibly threaten asymmetric nuclear destruction on U.S. nuclear forces – enabling a strategy of nuclear-backed coercion of the United States and its allies and partners, and thus potentially creating a wedge between them during a crisis.

Or perhaps an ally or partner could simply perceive this situation to be a possibility, even if there was little evidence behind it; the perception itself could be harmful for U.S. relations with that state.

The second unique attribute U.S. ICBMs provide allies and partners is the assurance that the United States has a prompt, visible, and scalable capability to respond to adversary actions in extreme circumstances. Discussed more in the section below, U.S. ICBMs provide different options for responding to large-scale conventional attacks on allies and partners, an adversary's large-scale employment of chemical or biological weapons, or any number of scenarios involving an adversary's limited nuclear employment. If the United States wants to convey its limited intentions, while also demonstrating resolve, ICBMs offer an option that potential adversaries will likely recognize beforehand as loaded with only one warhead and on a predictable flightpath – thus allowing the United States to potentially minimize some ambiguity to the adversary, provide some visible measure of the scale of the U.S. response, and provide some insight on U.S. intentions. ICBMs are unique in this regard in the U.S. nuclear triad as submarine-launched ballistic missiles (SLBMs) would likely be loaded with more than one warhead and air-launched cruise missiles and gravity bombs can be either conventional or nuclear-armed. There is of course no guarantee that potential adversaries will respond the way the United States hopes to these ICBM characteristics in a crisis or conflict, but in a situation where an ally or partner values attempting to reduce particular types of ambiguity, ICBMs provide a unique capability that SSBNs and bombers do not.

## The Value of ICBMs Should Deterrence Fail

Deterring nuclear and non-nuclear strategic attack remains the foremost mission for U.S. ICBMs, but this deterrence value is not separate from their potentially useful functions should deterrence fail. As then-Secretary of Defense Harold Brown stated, "... we have to plan our strategic forces on the basis of two assumptions: first, that deterrence might fail; and second, that our forces must be given the capability to frustrate any ambition that an enemy might attempt to realize with his strategic nuclear forces."<sup>18</sup> Nuclear deterrence can fail for any number of reasons, whether it is through miscalculation, misperception, or premeditation. In short, the United States may not wish for nuclear war, but it may happen nonetheless; therefore, national political leadership must work with civilian and military officials to be prepared to accomplish U.S. objectives should deterrence fail. These objectives may rightly include restoring deterrence prior to further escalation and reducing damage to the United States, its allies, and its partners.

As one commentator stated pithily, "While the failure of [nuclear] deterrence will certainly constitute the greatest mistake in human history, it may not constitute the last mistake."<sup>19</sup> Nuclear deterrence can fail with an adversary's limited nuclear employment or up to a general nuclear strike against U.S. strategic forces, or anywhere in between, but that does not mean ICBMs lose their deterrence value and only assume value as damage limitation instruments. Should nuclear deterrence fail due to an adversary's limited nuclear employment for example, the United States can

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<sup>18</sup> Harold Brown, *Annual Report Fiscal Year 1979* (Washington, D.C.: Department of Defense, February 2, 1978), p. 54, available at [https://history.defense.gov/Portals/70/Documents/annual\\_reports/1979\\_DoD\\_AR.pdf?ver=2014-06-24-150813-163](https://history.defense.gov/Portals/70/Documents/annual_reports/1979_DoD_AR.pdf?ver=2014-06-24-150813-163).

<sup>19</sup> Leon Wieseltier, "When Deterrence Fails," *Foreign Affairs*, Vol. 63, No. 4 (Spring 1985), p. 831.



respond with far less than its full nuclear arsenal and retain ICBMs as a major deterrent against further nuclear escalation. This potential deterrence cap on an opponent's escalation appears to be of increasing importance given the growing prominence of potential adversaries' capability to threaten or initiate limited nuclear strikes on the United States, its allies, and its partners.

At the strategic level, an adversary may believe some level of nuclear destruction is acceptable in service of its extreme national interests, but a major attack on the U.S. ICBM force and the relevant uncertainties and responses that could result may present an unacceptable risk. U.S. ICBMs, unlike bombers and SSBNs, are always present in the U.S. homeland and require a massive nuclear strike to even have a chance of being disabled – presenting an immensely high threshold for attack that may deter, or, if deterrence does fail, then deter further escalation to the highest levels of destruction. Ultimately, it is impossible to know whether an adversary's limited nuclear strike will result in a limited nuclear war, immediate surrender, a negotiated armistice, continued conventional war, general strategic war, or some other possibility; but, ICBMs may be key to preserving the potential for intra-war deterrence and preventing further escalation.

In addition, should the president seek a response to an adversary's nuclear strike, or non-nuclear strategic strike, ICBMs retain a number of qualities that National Command Authorities may find relevant to the circumstances. As the President's Commission on Strategic Forces, or the "Scowcroft Commission," wrote in its report: "ICBMs have advantages in command and control, in the ability to be retargeted readily, and in accuracy. This means that ICBMs are especially effective in deterring Soviet threats of massive conventional or limited nuclear attacks, because they could most credibly respond promptly and controllably against specific military targets and thereby promptly disrupt an

attack on us or our allies.”<sup>20</sup> A recent U.S. Department of Defense fact sheet states that because ICBMs are only loaded with one warhead, they allow “targeting flexibility” especially in cases of “an adversary’s limited use.”<sup>21</sup> As stated before, with the exception of the W76-2 low-yield SLBM, most SLBMs – while prompt like ICBMs – will likely be loaded with multiple warheads and thus less flexible for targeting; and air-based weapons – while flexible for targeting like ICBMs – are not likely to be prompt. Thus, ICBMs provide a unique combination of warhead numbers, range, and promptness that may prove valuable in responding to an attack.

As stated above, a U.S. president may seek to demonstrate both restraint and resolve in responding to an adversary’s limited nuclear strike – and one option to do so may be employing ICBMs. Some potential adversaries might readily identify such launches as MM IIIs, with a known payload, on a known trajectory, and in known numbers that can be confirmed via radars and other sensors. Again, this sort of information is not guaranteed either to be seen, transmitted, or acted upon correctly in the fog of war, but there are ways in which the United States can attempt to signal it has intentions that are constrained in scope that may prove useful in reducing the chance for misperceptions.

Some critics of U.S. ICBMs assert that, should deterrence fail, they would have no real military utility because, “... if, as is commonly assumed, most U.S. ICBMs are targeted against Russian nuclear forces, those Russian forces would

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<sup>20</sup> President’s Commission on Strategic Forces, *Report of the President’s Commission on Strategic Forces* (Washington, D.C.: Department of Defense, April 6, 1983), p. 8, available at <https://www.cia.gov/readingroom/docs/CIA-RDP85M00364R001101620009-5.pdf>.

<sup>21</sup> U.S. Department of Defense, “The Importance of the Nuclear Triad,” op. cit.

be launched on warning of the U.S. retaliatory attack — if they had not already been launched as part of the initial attack.”<sup>22</sup> In short, they argue that if launched under attack, U.S. ICBMs would have no viable adversary military targets to strike – and are thus not useful.

While there is no current official public information on this topic, U.S. defense officials have considered the post-attack military utility of ICBMs in the past as part of their efforts to introduce more flexibility into U.S. nuclear war plans. For example, the 1978 *Nuclear Targeting Policy Review*, commissioned by then-Secretary of Defense Harold Brown and led by former State Department official Leon Sloss, in one of its recommendations stated:

The JCS [Joint Chiefs of Staff] should develop a launch under attack package for ICBMs only that will be directed at a range of military and defense production targets but will result in minimum collateral damage consistent with achievement of its targeting objective. This launch under attack package should be ready for use beginning in the 1981-82 period and should include a broad set of nuclear and non-nuclear targets and command and control. It should also include such targets as the Soviet ASAT [anti-satellite] launch facilities and Soviet ASW [anti-submarine warfare] bases which might support attacks which could reduce US endurance. The attack should be designed so as to minimize collateral damage to population consistent with achievement of the attack objective. We do not see LUA as a solution to the problem of

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<sup>22</sup> Steve Fetter and Kingston Reif, “A Cheaper Nuclear Sponge,” *War on the Rocks*, October 18, 2019, available at <https://warontherocks.com/2019/10/a-cheaper-nuclear-sponge/>.

ICBM vulnerability, but believe such an option should, nevertheless, be available to the NCA.<sup>23</sup>

It is interesting to note that the study recommends providing an option for utilizing U.S. ICBMs that were launched under attack to destroy targets that could affect the remaining two legs of the U.S. nuclear triad. That is, ICBMs could be employed against ASW assets to reduce the threat to U.S. submarines, as suggested in the study, or perhaps against air and missile defenses to reduce the threats to U.S. bombers, as suggested by others.<sup>24</sup> Not only does each leg of the triad support each other in peacetime in the deterrence mission, but each leg can support the others when deterrence has failed by potentially being employed to reduce the number and type of threats to the remaining two legs.

### **The Value of ICBMs as a Hedge Against Uncertainty**

The 2018 *Nuclear Posture Review* identifies “hedging against an uncertain future” as the final traditional role for U.S. nuclear forces. The U.S. ability to modify its nuclear forces, including ICBMs, contributes to deterrence by signaling to potential adversaries that the United States can adapt its forces to meet new challenges in the security environment. The 2018 NPR also states, “The capacity to hedge contributes to deterrence and can help reduce potential adversaries’ confidence that they can gain an advantage via a ‘break out’ or expansion of nuclear capabilities.”<sup>25</sup>

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<sup>23</sup> U.S. Department of Defense, “Nuclear Targeting Policy Review (U),” *Archives.gov*, November 28, 1978, p. xv, available at <https://www.archives.gov/files/declassification/iscap/pdf/2011-064-doc39.pdf>.

<sup>24</sup> Colin S. Gray, *Missiles Against War: The ICBM Debate Today* (Fairfax, VA: National Institute for Public Policy, 1985), pp. 43-44.

<sup>25</sup> U.S. Department of Defense, *Nuclear Posture Review*, op. cit., p. 24.

Under the broader role of hedging against an uncertain future, the 2018 NPR identifies four different types of risk that U.S. nuclear forces, including ICBMs, can hedge against: geopolitical risk, technological risk, operational risk, and programmatic risk.

U.S. ICBMs can act as a hedge against geopolitical risks because U.S. officials can order additional warheads be uploaded in response to adverse developments in the security environment. Since MM III ICBMs can carry up to three warheads, two more than they carry now, this means there is the potential to upload an additional 800 warheads to the ICBM force. This ability to upload, if needed, is important because it provides a much less costly and more timely option to increase U.S. nuclear capabilities compared to a crash program in response to changing deterrence requirements.<sup>26</sup> If, for example, China's nuclear program continues its projected fast-paced growth over the next two decades, shifting U.S. deterrence requirements may necessitate additional warheads for the U.S. nuclear force. ICBMs at that point could be uploaded with additional warheads as a potentially cost-effective response without needing to procure additional delivery systems or develop new ones.

In addition, as stated in a previous National Institute report, the U.S. ability to upload additional warheads, "... could help deter as well as respond to arms control violations, nuclear-backed coercion, threats of stepped-up nuclear competition, and other aggressive acts."<sup>27</sup> For

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<sup>26</sup> One must acknowledge that "more timely" in this context is relative in that uploading additional warheads would likely take a good deal of time to accomplish, but relative to beginning a new program or procuring and manufacturing greater quantities of existing weapons, uploading should be considered a much faster process.

<sup>27</sup> Keith B. Payne and John S. Foster Jr., et. al., *A New Nuclear Review for a New Age* (Fairfax, VA: National Institute for Public Policy, April 2017), p. 102, available at <https://www.nipp.org/wp-content/uploads/2017/06/A-New-Nuclear-Review-final.pdf>.

example, if Russia, which has a history of significant arms control violations, were to violate the terms of the New START Treaty or a future treaty, then the United States would have the option, if seen as appropriate, of uploading a limited number of additional warheads on ICBMs to offset any military advantage that Russia might gain from the violation, and eventually persuade Moscow, in conjunction with other measures, back into compliance.

U.S. ICBMs also act as a hedge against technical risks – both foreign and domestic. Should adversaries achieve a significant breakthrough in anti-submarine warfare technology that represents an increased risk to U.S. strategic submarines, ICBMs can still meet U.S. deterrence requirements. Just as there was concern in the late Cold War about ICBM vulnerability to a Soviet first strike on the silos – which the SSBN force hedged against – so too today and in the future, should there be an unexpected breakthrough in adversary ASW that increases risk to U.S. submarines, ICBMs can still perform many of the same missions. It is important to note in this regard that only ICBMs can adequately act as a hedge against a partial or catastrophic technological risk against SSBNs since they share many of the same qualities in promptness, ability to upload, difficulty to target, and survivability in flight. And while there may be no near- to mid-term threats to SSBN survivability, it is simultaneously true that history is replete with confident predictions of technological trends that turned out to be false (e.g., “the bomber will always get through”).

Technological risk, however, does not always originate from potential adversaries. As stated in an unclassified report written for the Department of Energy, “In actuality, at times in the past the warheads for a large part of the U.S. FBM [fleet ballistic missile] force have been found to be badly deteriorated. At different times, a large fraction of the warheads either obviously or potentially would not work;

they were obvious or potential duds.”<sup>28</sup> Examples cited in the report include the W47 and W68 warheads – both of which were based on the sea-leg of the U.S. nuclear triad. Again, ICBMs can serve as a valuable hedge against unexpected technological risks encountered during the U.S. nuclear modernization effort.

U.S. ICBMs may also be able to incorporate new technology as a response or hedge against potential adversaries’ technological developments. The authors of the RAND Corporation study on ICBM options note specifically, “The addition of penaids [penetration aids] or a MaRV [maneuverable re-entry vehicle] could add defense or terrain-penetrating capabilities, thereby broadening the set of potential targets. Increasing the number of RVs could add to the targeting potential of the missile by allowing for multiple RVs on a single target or by targeting multiple objects.”<sup>29</sup> As with uploading, the U.S. ability to incorporate new technology on existing delivery systems like ICBMs provides a cost-effective option for leadership to make necessary adjustments to the force in response to changes in the security environment, potentially obviating the need to develop a wholly new delivery system.

The third kind of risk that U.S. ICBMs can hedge against is operational risk – defined in the 2018 NPR as “the potential for operational shortfalls that reduce the effectiveness of U.S. nuclear forces. It includes reduced availability of deployed forces, intelligence collection gaps that inhibit identification or characterization of designated targets, and any unmet requirement needed to sustain

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<sup>28</sup> J.W. Rosengren, *Some Little Publicized Difficulties with a Nuclear Freeze* (Washington, D.C.: Department of Energy, October 1983), p. 13, as submitted for the record in U.S. Senate, *Nuclear Testing Issues* (Washington, D.C.: Government Printing Office, May 8, June 19 and 26, 1986), S. Hrg. 99-937, pp. 161-192.

<sup>29</sup> Caston, Leonard, Mouton, et. al., *The Future of the U.S. Intercontinental Ballistic Missile Force*, op. cit. p. 19.

effective deterrence.”<sup>30</sup> While this can refer to operational losses during combat, ICBMs are the most effective hedge against operational incidents that can occur during peacetime as well. Since there are limited numbers of submarines and bombers (14 Ohio-class SSBNs and 66 nuclear-capable bombers) each unit has more relative value than the 400 ICBMs – that is, a submarine that is not operational is of greater significance than a single ICBM that is not operational. In short, a U.S. nuclear force without ICBMs would be much more significantly degraded by operational losses than a force with ICBMs.

Finally, *ICBMs can act as a hedge against programmatic risks* that may arise while modernizing the other two legs of the nuclear triad. Programmatic risk could manifest itself in the faster-than-expected deterioration of current systems, delayed life extension programs, or unexpected shifts in the initial operational capability dates of the new systems. While the U.S. Congress can mitigate some of these risks by steadily and predictably funding these systems, that is not always the case, and even with consistent political support, other technological issues of service life extension programs (SLEPs) may arise.

### **Other Valuable Attributes**

Outside of the four traditional roles of nuclear weapons described above, there are three more ICBM attributes that are worth mentioning.

First, U.S. ICBMs are the least costly weapon systems to operate, maintain, and modernize in the nuclear triad. The Congressional Budget Office estimates that the Department of Defense and Department of Energy combined spend about \$2 billion annually to operate the MM III force, \$3 billion annually to operate the SSBN fleet, and \$4 billion

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<sup>30</sup> U.S. Department of Defense, *Nuclear Posture Review*, op. cit., p. 38.



annually to operate the nuclear-capable bomber force.<sup>31</sup> The same report also estimated the 30 year costs of maintaining and modernizing the ICBM force and found that over the same time period, maintaining and modernizing bombers would cost nearly 80 percent more than ICBMs, and maintaining and modernizing nuclear submarines would cost over 110 percent more than ICBMs.<sup>32</sup>

Second, the United States expects GBSD to have a lengthy expected service life – operating until 2075 and perhaps longer.<sup>33</sup> Given that MM III was built with a 10-year expected service life, it is reasonable to believe the GBSD can operate well into the 2070s. The greatest costs of the program will likely be on the front end with development and procurement, but as seen above, costs will likely drop dramatically given the low maintenance costs of ICBMs historically and the modularity that will be built into GBSD – which is expected to reduce maintenance down time and cost.<sup>34</sup>

Third, a U.S. nuclear arsenal with ICBMs is far more likely to contribute to a possible future arms control agreement that advances U.S. national interests. Without ICBMs, for instance, U.S. diplomats would have far fewer possible tools to influence Russia or China to accept an agreement – nor would they have any “in kind” delivery

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<sup>31</sup> Congressional Budget Office, *Approaches for Managing the Costs of U.S. Nuclear Forces, 2017-2046* (Washington, D.C.: CBO, October 2017), pp. 18-19, available at <https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/53211-nuclearforces.pdf>.

<sup>32</sup> *Ibid.*, p. 2.

<sup>33</sup> Office of the Under Secretary of Defense (Comptroller) / Chief Financial Officer, *Program Acquisition Cost by System* (Washington, D.C.: Department of Defense, February 2020), p. 5-19, available at [https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2021/fy2021\\_Weapons.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2021/fy2021_Weapons.pdf).

<sup>34</sup> Benji Johnson, “Defense Primer: Ground Based Strategic Deterrent (GBSD) Capabilities,” *Congress.gov*, November 10, 2020, available at <https://crsreports.congress.gov/product/pdf/IF/IF11681>.

systems to pair with Russian or Chinese ICBMs. While some may counter that life-extended MM III ICBMs can play the same role as GBSD for arms control leverage, remarks by Russian officials indicate the age of a system matters a great deal in arms control negotiations. A Russian diplomat would rightly question just how highly the United States values its ICBMs if in one or two decades the force would begin to age out of existence with no plans for a replacement. And why would Russia be interested in reducing its modern ICBM force in exchange for reductions in a rapidly aging U.S. force with a known, limited “shelf life?” In one prominent example, Sergei Ivanov, then-Chief of Staff to Russian President Vladimir Putin, said, “When I hear our American partners say: ‘Let’s reduce something else,’ I would like to say to them: ‘Excuse me, but what we have is relatively new.’ They [the U.S.] have not conducted any upgrades for a long time. They still use Trident [missiles].”<sup>35</sup> Historically the United States has found success in arms control discussions when it possessed relatively new and highly capable systems that had a clear Russian counterpart; thus, new U.S. ICBMs could be a strong incentive, albeit one among many, that might contribute – if desired – to persuading states like Russia and China to join the arms control process on terms favorable to the United States.

## **Why GBSD?**

As Minuteman III enters its sixth decade of service, it has been life-extended multiple times, but is now at the point where U.S. military officials say that further life extension

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<sup>35</sup> Sergei Ivanov as quoted in, “Russia not Interested in U.S.-Proposed Arms Reduction - Russian Presidential Chief-of-Staff,” *RBTH*, March 5, 2013, available at [https://www.rbth.com/news/2013/03/05/russia\\_not\\_interested\\_in\\_u-s-proposed\\_arms\\_reduction\\_-\\_russian\\_presidenti\\_23504.html](https://www.rbth.com/news/2013/03/05/russia_not_interested_in_u-s-proposed_arms_reduction_-_russian_presidenti_23504.html).

programs are either infeasible or too costly compared to developing a new, more capable replacement, the Ground Based Strategic Deterrent. There are two major issues with further life-extending Minuteman III ICBMs – first, further life-extension programs may introduce additional risk and degrade U.S. confidence in their reliability, and second, at the average test launch rate of about three to four MM III ICBMs per year, the ICBM force will eventually attrit out of existence due to testing and aging, with the process affecting deployed warhead numbers under New START beginning in 2030.<sup>36</sup> Some have suggested requiring fewer tests of MM III ICBMs so that further life-extension programs can delay or obviate the procurement of GBSD.<sup>37</sup> Yet, as will be discussed in a subsequent section, reducing the number of tests per year will degrade U.S. confidence in the reliability of an aged missile – and it is not clear, as U.S. military officials have stated, that even if one found it wise to reduce testing, that the service life extension programs for MM III would be cost effective or even work as intended.

As then-U.S. Strategic Command Commander, Gen. John Hyten, responded when asked whether he believed MM III life extension was a viable option:

No. It's not viable. I can't say that any stronger. I've worked with Minuteman III. I did not work on the Minuteman I system. But I've worked on the Minuteman III for a long, long time. In fact, when I was at Space Command I was the Director of Requirements ten years ago. I wrote a requirements

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<sup>36</sup> Caston, Leonard, Mouton, et. al., *The Future of the U.S. Intercontinental Ballistic Missile Force*, op. cit., p. 85.

<sup>37</sup> Garrett Hinck and Pranay Vaddi, "Setting a Course Away from the Intercontinental Ballistic Missile," *War on the Rocks*, February 16, 2021, available at <https://warontherocks.com/2021/02/setting-a-course-away-from-the-intercontinental-ballistic-missile/>.

document for the follow-on to the Minuteman III because at that time we were finishing the guidance replacement program and the propulsion replacement program for the Minuteman III, and we knew that that would give us maybe 20 years. Twenty years at best. And then the system would actually fall apart. And so I saw it with my own eyes. I saw what we were doing. I saw the reality of it. And that system will not last. It will not. It will cost us, you'll basically be building a new ICBM out of the old core which will end up costing you more money.<sup>38</sup>

Beyond current U.S. military officials, Madelyn Creedon – former Obama administration Principal Deputy Administrator, National Nuclear Security Administration – was asked about extending the life of MM III ICBMs recently, and responded, “This was something that was looked at, extensively, at the end of the Obama administration, and even though there was, I would say, a lot of desire to do this and avoid the cost of the new system, at the end, we concluded that it really wasn’t – it really wasn’t possible, that these really have reached the end of their life, and they – and if we’re going to have ICBMs, they have to be replaced.”<sup>39</sup>

The Obama and Trump administrations therefore both agreed on the need to move forward with the Ground Based

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<sup>38</sup> John E. Hyten, “Mitchell Institute Breakfast Series,” *STRATCOM.mil*, June 20, 2017, available at <https://www.stratcom.mil/Media/Speeches/Article/1226883/mitchell-institute-breakfast-series/>.

<sup>39</sup> Madelyn Creedon, as quoted in, “Strategic Nuclear Modernization in the United States,” *Brookings Institution*, March 4, 2021, available at [https://www.brookings.edu/wp-content/uploads/2021/03/fp\\_20210304\\_strategic\\_modernization\\_transcript.pdf](https://www.brookings.edu/wp-content/uploads/2021/03/fp_20210304_strategic_modernization_transcript.pdf).

Strategic Deterrent, both as an upgrade to the current MM III and because MM III life extension was judged inadvisable. Importantly, the GBSD program will not only replace the missile, but will refurbish the silos, upgrade command and control, and improve the launch control centers. While the Air Force and Department of Defense have stressed that GBSD will incorporate “low risk, technically mature components” to bring down costs, there are three main characteristics of the new ICBM that make replacement more desirable: modularity, security, and in-flight survivability.<sup>40</sup>

GBSD’s modular design will enable more efficient operation and maintenance, as well as possible upgrades in the future, while producing manpower savings. The way current MM III ICBMs are configured in their silos occasionally requires opening the launcher closure door (above the missile) to perform maintenance, which in turn requires a security team to be on guard – whereas GBSD will allow maintenance crews to perform their work without opening the launcher closure door as often.<sup>41</sup> As Gen. Timothy Ray, Commander of Air Force Global Strike Command stated recently, “I can rapidly modify, upgrade and, more importantly, sustain it [GBSD]... We will see a two-thirds reduction in the number of [security and maintenance] convoys I have to conduct. There will be a two-thirds reduction in the number of times I actually have to ... open the launcher and close the door. And when I talk to the teammates at [the Office of the Secretary of Defense] they absolutely affirm that we’ve really designed sustainment and modernization into this in an incredibly

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<sup>40</sup> U.S. Department of Defense, “The Importance of the Nuclear Triad,” op. cit.

<sup>41</sup> Johnson, “Defense Primer: Ground Based Strategic Deterrent (GBSD) Capabilities,” op. cit.

creative and effective way.”<sup>42</sup> Since the cost of military personnel is often one of the largest cost drivers of a program, such an increase in efficiency should provide significant cost savings once GBSD is deployed.

Though discussed less frequently, GBSD will provide increased security against advanced cyber threats in ways the MM III does not. As STRATCOM Commander ADM Charles Richard said, “One of the biggest pieces is in its cyber resilience. We will replace a 60 year old, basically a circuit switch system with a modern cyber defendable up to current standards command and control system. So just to pace the cyber threat alone, GBSD is a necessary step forward. But it is also far more flexible and resilient against any number of other threats that are presented.”<sup>43</sup> As cyber threats grow more sophisticated, it will likely become increasingly important for the land-based portion of the U.S. nuclear force to have built in resilience from the beginning of a new program, rather than sophisticated patches on an old program.

Finally, U.S. officials have described a number of GBSD features that will increase its in-flight survivability over that of the MM III. One of the features reported by Air Force officials is that the GBSD boosters will reportedly be lighter than the MM III boosters, providing greater throw weight, and thus potentially allowing for more, or more sophisticated, missile defense countermeasures to be

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<sup>42</sup> Gen. Timothy Ray, Commander of Air Force Global Strike Command, as quoted in, Jon Harper, “Next-Gen Nuclear Missile Viewed as Pathfinder,” *National Defense Magazine*, December 4, 2020, available at <https://www.nationaldefensemagazine.org/articles/2020/12/4/next-gen-nuclear-missile-viewed-as-pathfinder>.

<sup>43</sup> Charles A. Richard, “Defense Writers Group,” *George Washington School of Media and Public Affairs*, January 5, 2021, available at <https://cpb-us-e1.wpmucdn.com/blogs.gwu.edu/dist/2/672/files/2021/01/DWG-Admiral-Charles-R.-Richard.pdf>.

incorporated.<sup>44</sup> As ADM Richard recently stated, "... what GBSD will do is add capabilities that enables it to pace the threat. The threat against this weapon system is not the one that we had 60 years ago when we designed the Minuteman III. So yes, she has improved capabilities to enable her to continue to deliver the effect that we ask that weapon system to go do."<sup>45</sup> ADM Richard's predecessor, now Vice Chairman of the Joint Chiefs of Staff, Gen. John Hyten, stated similarly, "Finally, replacing 1960 and 1970s technology with state-of-the-art systems will increase effectiveness and provide better platform performance with greater resilience against improving adversary defenses."<sup>46</sup>

Given the aging MM III, the dynamic security environment, and potential upgrades offered by shifting the ICBM force to GBSD, it appears U.S. ICBMs will be well equipped to meet current military requirements while retaining enough payload flexibility to adapt to future uncertainties. Yet, others have used the debate about GBSD to pose broader questions about the need for ICBMs at all. With the four traditional roles of ICBMs explained above, it useful to explore the flip side of the debate – what might be the consequences of eliminating ICBMs from the U.S. nuclear force?

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<sup>44</sup> Johnson, "Defense Primer: Ground Based Strategic Deterrent (GBSD) Capabilities," op. cit., p. 2.

<sup>45</sup> Richard, "Defense Writers Group," op. cit.

<sup>46</sup> John E. Hyten, "Statement of John E. Hyten, Commander, United States Strategic Command." *STRATCOM.mil*, March 7, 2018, p. 10, available at <https://www.stratcom.mil/Portals/8/Documents/2018%20USSTRATCOM%20HASC-SF%20Posture%20Statement.pdf?ver=2018-03-07-125520-187>.

## U.S. Defense Without ICBMs?

Critics of ICBMs in general, and GBSD in particular, offer a number of reasons why the United States can shift away from a nuclear triad to a dyad of only bombers and submarines. Some say that the United States could absorb a Russian first strike with only submarines (nearly invulnerable at sea) and bombers and still have enough weapons to inflict unacceptable damage – thus preserving deterrence of even massive first strikes.<sup>47</sup> Others state that ICBMs are too vulnerable, causing presidents to possibly launch them during a false alarm of attack in order to save them.<sup>48</sup> Still others believe SLBMs can perform all the necessary missions just as well or better than ICBMs, making ICBMs redundant.<sup>49</sup> These criticism, among others that are addressed later, make it worth considering some of the possible consequences of eliminating U.S. ICBMs altogether.

### Fewer Strategic Assets and More Vulnerable to Conventional Attack

To begin, without ICBMs, the U.S. nuclear force would essentially be reduced to five military bases that host

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<sup>47</sup> Hinck and Vaddi, "Setting a Course Away from the Intercontinental Ballistic Missile," op. cit.

<sup>48</sup> William J. Perry and James E. Cartwright, "Spending Less on Nuclear Weapons Could Actually Make Us Safer," *The Washington Post*, November 16, 2017, available at [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](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).

<sup>49</sup> David Wright, William D. Hartung, and Lisbeth Gronlund, *Rethinking Land-Based Nuclear Missiles* (Washington, D.C.: Union of Concerned Scientists, June 2020), p. 21, available at <https://ucsusa.org/sites/default/files/2020-06/rethinking-land-based-nuclear-missiles.pdf>.



nuclear-capable forces: two submarine bases (Kings Bay, GA and Bangor, WA) and three bomber bases (Minot AFB, ND; Barksdale AFB, LA; and Whiteman AFB, MO). Since U.S. bombers have not been on standing alert since 1991, they would appear unlikely to survive an adversary's ICBM or SLBM attack, which would provide very little time for generation and dispersal. Thus, the United States would be left with its strategic submarines, two of which are usually in overhaul at any given time, plus the submarines that are docked in port (an average of 35 days) for maintenance, which are far more vulnerable to attack.<sup>50</sup> While it is true that the United States could launch a devastating nuclear response from submarines at sea on an adversary that attacks the five bases mentioned above, there are issues of deterrence, proportionality, and credibility that critics do not adequately address.

It is important to recognize the incredible shift that would take place moving from a U.S. nuclear arsenal with ICBMs to a nuclear arsenal without ICBMs. The U.S. strategic force as a whole would move from being essentially invulnerable to conventional attack to being very vulnerable to conventional attack. While U.S. submarines at sea and bombers in the air are survivable, they both must return to their bases eventually to be resupplied – and Russia, and perhaps China in the near future, has the conventional weapons to attack each of the five remaining bases in the U.S. homeland with very little warning *while staying below the nuclear threshold*. As the Defense Intelligence Agency notes, Russia's *Kalibr* (SS-N-30A) sea-launched land-attack cruise missiles reportedly have an

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<sup>50</sup> Amy F. Woolf, *U.S. Strategic Nuclear Forces: Background, Developments, and Issues* (Washington, D.C.: Congressional Research Service, September 3, 2019), pp. 21-22, available at [https://crsreports.congress.gov/product/pdf/RL/RL33640/58](https://crsreports.congress.gov/product/pdf/RL/RL33640/58;); Strategic Systems Programs, "FBM Weapon System 101," *Navy.mil*, no date, available at <https://www.ssp.navy.mil/fb101/submarines.html>.

operational range of up to 2,500 km which would place all of the five remaining bases within range.<sup>51</sup> China is also developing stealth bombers, which if combined with the reported range of its current air-launched cruise missiles, could place some U.S. bases at risk of conventional attack.<sup>52</sup>

Without ICBMs, a far greater percentage of the U.S. nuclear arsenal could be destroyed either with conventional weapons alone, or by a limited nuclear attack. For example, according to the last New START Treaty data exchange of 2020, the United States has around 1450 warheads on deployed systems, including almost 400 on ICBMs and about 66 bombers that each count as one warhead. Thus, there appear to be approximately about 1,000 warheads that are deployed on SLBMs. The United States declared that its number of deployed SLBMs is 230 – which means there is an average of about four warheads per Trident II D5 SLBM. Each Ohio class SSBN can carry a maximum of 20 SLBMs. If there are 20 SLBMs with about 4 warheads per missile, then on average an Ohio-class SSBN would likely carry about 80 warheads.

In a plausible scenario therefore, without ICBMs in the U.S. nuclear force, one U.S. SSBN could be undergoing an Extended Refit Period (ERP) (7-8 months) while two other SSBNs would be in port for their Incremental Refit, with a

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<sup>51</sup> Defense Intelligence Agency, *Russia Military Power* (Washington, D.C.: DIA, 2017), p. 78, available at <https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Russia%20Military%20Power%20Report%202017.pdf?ver=2017-06-28-144235-937>.

<sup>52</sup> Defense Intelligence Agency, *China Military Power* (Washington, D.C.: DIA, 2019), p. 85, available at [https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/China\\_Military\\_Power\\_FINAL\\_5MB\\_20190103.pdf](https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/China_Military_Power_FINAL_5MB_20190103.pdf); See also, Congressional Budget Office, *National Cruise Missile Defense* (Washington, D.C.: CBO, February 2021), p. 20, available at <https://www.cbo.gov/system/files/2021-02/56950-CMD.pdf>.

possible total of 240 warheads.<sup>53</sup> Russia could strike them using submarine-launched conventional cruise missiles – resulting in the disablement of nearly a quarter of the entire U.S. treaty-accountable nuclear force. Russia could possibly execute such an attack without indications and warning while staying below the threshold of a nuclear attack – forcing a U.S. president to consider, among other options, symmetrical attacks on Russian SSBNs (which would likely cause less damage overall to Russian nuclear forces that are mostly ICBM-based), more risky conventional attacks on Russian ICBM forces in its heartland, or escalation to nuclear use.

A U.S. nuclear arsenal without ICBMs would therefore cause a greater percentage of its nuclear forces to be vulnerable to conventional attack – a situation an adversary may find tempting to exploit utilizing a limited conventional attack while gaining the outsized benefit of disabling a significant percentage of the U.S. nuclear force and staying below the threshold of nuclear employment.

### **Increased Consequences of Peacetime or Wartime Attrition**

Without ICBMs, the U.S. nuclear force would face far greater consequences as a result of accidents during peacetime or operational losses during wartime. As the number of strategic assets decline, their relative value increases – thus the loss of one delivery system will be that much more damaging to the force overall and restrict the options available to the president. For example, in 2012 a

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<sup>53</sup> For information on refit times see, Department of Defense Inspector General, (U) *Evaluation of Nuclear Ballistic Missile Submarine (SSBN) Sustainment* (Washington, D.C.: Department of Defense, June 15, 2018), p. 4, available at <https://media.defense.gov/2018/Jun/28/2001937172/-1/-1/1/DODIG-2018-127.PDF>.

shipyard worker lit a fire in a U.S. nuclear-powered submarine while in port so he could go home early – which caused approximately \$450 million worth of damage and put the submarine out of commission for years.<sup>54</sup> As another example, a B-2 bomber crashed on Guam in 2008, due to moisture causing the plane's air data system to malfunction.<sup>55</sup> Such kinds of losses to the U.S. nuclear arsenal during peacetime likely would not greatly affect the U.S. nuclear triad overall, but without ICBMs, such losses could have a greater impact on operational availability.

Operational losses of U.S. nuclear forces during wartime could be even more significant should the United States eliminate ICBMs. For example, the United States would likely utilize many nuclear-capable bombers in their conventional roles during a wartime situation – possibly decreasing the number of assets available to the president for a nuclear mission. And, as stated above, SSBNs can stay on patrol for extended periods of time but must eventually be re-supplied, and thus become more vulnerable to conventional attack while in port in a wartime situation.

In addition, while critics of ICBMs often cite the difficult decision a president may have to make on whether to launch U.S. ICBMs under attack or “ride out” the attack – such a difficulty would not disappear with the elimination of ICBMs from the U.S. nuclear arsenal. Without ICBMs in the U.S. nuclear arsenal, a greater percentage of U.S. nuclear warheads would be placed on SSBNs, making each submarine a much more valuable asset. If, in a wartime situation, the United States lost communication with one of

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<sup>54</sup> Associated Press, “Man Who Set Fire to Nuclear Submarine Gets 17 Years,” *USA Today*, March 15, 2013, available at <https://www.usatoday.com/story/news/nation/2013/03/15/nuclear-submarine-fire/1990663/>.

<sup>55</sup> ACC News Service, “B-2 Accident Report Released,” *AF.mil*, June 6, 2008, available at <https://www.af.mil/News/Article-Display/Article/123360/b-2-accident-report-released/>.

its SSBNs, perhaps with reports of enemy submarines or ASW forces in the area, a U.S. president would be confronted with the possibility that the adversary had made a surprise breakthrough in its ASW capability, thus placing the majority of U.S. nuclear forces at risk. Of course, losing communication with a submarine could mean anything, from an accidental technical error to a calculated adversary attack – but the U.S. president would have to seriously consider the latter possibility, and perhaps factor in an adversary’s “plausible deniability” claim. In any case, the loss of an SSBN could create a growing “use or lose” perception for a U.S. president as a conflict continues – a perception that would be far less likely to arise if the U.S. nuclear arsenal also retained ICBMs as a hedge against SSBN losses.

It should be noted that it is highly speculative to suggest that a president would launch nuclear weapons simply to avoid them being lost in an attack, as if there were no other militarily valid reasons. However, to the extent such a possibility is a concern, it certainly could apply with increased emphasis to SSBNs in the absence of ICBMs in the U.S. force.

### **Cost Savings Not as Advertised**

While critics of ICBMs often cite the cost savings that would result from reducing or eliminating ICBMs from the U.S. nuclear arsenal, they often do not account for the increased costs of defending the small number of highly-valued sites associated with the remaining two legs of the nuclear arsenal. For example, as discussed above, U.S. submarines that are docked in port are vulnerable to missile strikes – and since each submarine would increase in relative value after eliminating ICBMs, each port would likely require extensive ballistic missile defense (BMD), cruise missile defense (CMD), and perhaps hypersonic missile defense

(HMD). Such missile defenses may be desirable in any case, but without ICBMs as a last line of defense against surprise attack, investments in air and missile defense of key strategic facilities such as ports and airfields may become a requirement.

In addition, as a recent Department of Defense fact sheet notes, without ICBMs, the United States may have to purchase additional bombers and submarines beyond the numbers already planned to meet both conventional requirements as well as additional nuclear responsibilities.<sup>56</sup> Plus, the United States may need to place some portion of the nuclear-capable bomber force on constant or airborne alert to avoid being destroyed in a first strike. Placing bombers on alert would require increased budgets for operations and maintenance while also lowering the expected service life of each bomber – again, increasing costs.

### **Increased Risk to Remaining Legs of Nuclear Triad**

Not only would eliminating U.S. ICBMs significantly decrease an adversary's difficulty in targeting U.S. nuclear forces, but it would also allow potential adversaries to narrow the range and type of threats they face, and thus focus their investments accordingly. In short, potential adversaries would likely place more value in anti-submarine warfare and air and missile defense capabilities if the United States eliminated its ICBMs, resulting in an overall increased threat to the remaining U.S. nuclear systems. For example, as the Scowcroft Commission concluded: "If it were possible for the Soviets to concentrate their research and development efforts on putting only one or two components of U.S. strategic forces at risk – e.g., by an intensive effort at anti-submarine warfare to attempt to

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<sup>56</sup> U.S. Department of Defense, "The Importance of the Nuclear Triad," op. cit.

threaten our ballistic missile submarines – both their incentive to do so and their potential gains would be sharply increased.”<sup>57</sup> While critics may contend that even with potential adversaries’ increased investment in ASW, U.S. SSBNs are likely to remain survivable, it should be noted that a surprise breakthrough in ASW would threaten the vast majority of U.S. nuclear weapons without ICBMs in the force – thus requiring either a change in tactics (e.g., a “bastion strategy” that protects SSBNs in coastal waters with general purpose forces) or a crash buildup in air-deliverable weapons.

### **Less Assurance and More Proliferation**

Eliminating U.S. ICBMs would likely dramatically alter how not only potential adversaries view the United States, but also how allies and partners perceive the credibility of U.S. assurances and extended deterrence. U.S. commitments to allies and partners around the world, and especially in Europe and Asia, would likely be extremely tested by such a dramatic change in U.S. nuclear force structure. Even if pre-briefed and explained well in advance to allies and partners, they could justifiably perceive the elimination of U.S. ICBMs as a U.S. retreat from its overseas commitments. After the elimination of U.S. ICBMs, allies and partners would rightly wonder what other major changes in U.S. defense policy and capabilities could happen next, be it nuclear or conventional, and what the impacts might be on their security. For some U.S. allies and partners, investing in their own nuclear weapon capability might shift from a distant unimaginable possibility to a seriously considered option in the wake of perceived U.S. unreliability. U.S. allies and partners would also likely feel all the more confused about U.S. motivations in eliminating

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<sup>57</sup> President’s Commission on Strategic Forces, *Report of the President’s Commission on Strategic Forces*, op. cit., p. 7.

its ICBMs when states like Russia, China, and North Korea are doubling down on modernizing their ICBM-centric nuclear forces.

### **Far Less Incentive for Others to Engage in Nuclear Arms Control**

An obvious though little-discussed downside to eliminating U.S. ICBMs is the diminished prospect for limiting the nuclear arsenals of states like Russia and China through arms control agreements. If the United States were to eliminate its ICBM force, Russia and China would have little to no incentive to negotiate down their ICBM-centric nuclear forces as the United States would have nothing symmetrical to offer in return. In fact, the only forces the United States could offer to trade with are the forces in which it has a qualitative advantage – submarines and bombers. U.S. diplomats, and those of other states, typically try to protect those forces where they have advantages while being willing to bargain in areas where they are relatively and comparatively weaker – but eliminating U.S. ICBMs would flip this tactic and force U.S. diplomats to negotiate from a position of weakness. In fact, states like Russia and China would likely be incentivized to wait or ask for further unilateral U.S. nuclear reductions before joining an arms control discussion, thus further minimizing the chances for nuclear reductions.

### **Fewer Options Should Deterrence Fail**

ICBMs add value to the U.S. nuclear arsenal, both as weapons that an adversary would have to account for before attacking U.S. cities, as well as tools to limit damage. If Russia retains a counterforce nuclear doctrine as its force structure appears to indicate, a U.S. nuclear force that includes ICBMs presents – as described earlier – an intractable targeting problem in which Russian military



planners would likely need to employ at least two warheads per U.S. silo and launch control center, for a total of 900 warheads at minimum. Should nuclear deterrence fail and the U.S. nuclear force not have ICBMs, there would be far fewer U.S. nuclear capabilities that Russia would need to target to eliminate U.S. military potential. As a number of experts have indicated, at the scale of global nuclear war, Russia appears willing to target U.S. countervalue objects such as population centers.<sup>58</sup> In short, without ICBMs in the U.S. nuclear force, the potential list of military targets in the United States shrinks considerably while the Russian capacity to resort to coercive strikes against U.S. cities after destroying U.S. military targets would likely grow.

Beyond their role in absorbing adversary attacks should deterrence fail, U.S. ICBMs can also serve as tools for damage limitation – that is, striking adversary military targets so that they cannot be used in further escalating strikes against the United States, its allies, or its partners. Without ICBMs in the U.S. nuclear force, the U.S. ability to limit damage will itself be limited by submarine and bomber availability. In addition, should nuclear deterrence fail without ICBMs in its nuclear force, the United States could respond promptly with SLBMs – but would have a less credible force to hold in reserve to deter further nuclear escalation. In other words, while there is no guarantee such a strategy would work, a U.S. president could employ ICBMs against adversary military targets while holding SLBMs in reserve as the most survivable leg; but, without ICBMs, the same size response would leave a smaller percentage of the U.S. nuclear arsenal remaining, and thus adversaries may consider the reserve to be a less credible deterrent against further escalation.

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<sup>58</sup> Michael Kofman, Anya Fink, Jeffrey Edmonds, et. al., *Russian Strategy for Escalation Management: Evolution of Key Concepts* (Washington, D.C.: CNA, April 2020), pp. 22, 47-48, available at [https://www.cna.org/CNA\\_files/PDF/DRM-2019-U-022455-1Rev.pdf](https://www.cna.org/CNA_files/PDF/DRM-2019-U-022455-1Rev.pdf).

As one commentator stated, "It is unused [nuclear] weapons, and not destroyed [nuclear] weapons, that will provide the assurance necessary for the conclusion of an armistice."<sup>59</sup> Although perhaps too general a prediction, the point stands that if and when nuclear deterrence fails and escalates into a general nuclear war, if there is any hope of keeping the conflagration from reaching civilization-ending destruction, then adversaries will need a reason to limit their actions and realize that no matter how destructive past actions have been, things can always get worse. The reason to refrain from further escalation will not likely be benign assurances from the other side, since who will trust the word of a nuclear antagonist? This suggests the importance of possessing a sufficiently large and survivable nuclear arsenal such that even after a massive first strike, the United States can still respond in ways that ensure the adversary cannot accomplish its objectives or escape destruction. If and when nuclear deterrence fails and a potential adversary like Russia strikes U.S. ICBMs, the missiles can contribute to these goals by absorbing the majority of the Russian intercontinental nuclear arsenal and/or destroying much of Russia's military capabilities and potential – with the U.S. submarine force likely kept in reserve to deter even further escalation.

As Herman Kahn once stated, "It is therefore very important to enlarge so far as possible the disparity between the damage the enemy has already suffered, and the damage that he will suffer if he continues the war."<sup>60</sup> Without ICBMs in the U.S. nuclear force, that mission – which appears remote and implausible in peacetime – will take on the highest level of global importance during a nuclear war.

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<sup>59</sup> Wieseltier, "When Deterrence Fails," op. cit., p. 842.

<sup>60</sup> Herman Kahn, *On Thermonuclear War* (Princeton, NJ: Princeton University Press, 1960), p. 183.

### **Potential Adversaries Would Perceive U.S. Military as Weak or Foolish**

Finally, should the United States remove ICBMs from its nuclear arsenal, adversary perceptions about the U.S. nuclear force, the military overall, and perhaps U.S. credibility as a guarantor of its allies' and partners' security would likely degrade to the detriment of global security.<sup>61</sup> It seems inevitable that the military leaders of Russia and China, who command strategic arsenals that are centered around land-based ICBMs, would perceive the unilateral U.S. elimination of its ICBMs as a sign of inherent weakness or foolishness, which could in turn lead to their perception that there are potentially new options to pursue more aggressive military policies against U.S., allied, and partner interests. As a hypothetical example, it would be as if Russia gave up its precision strike conventional weapons unilaterally and without advancing a superior alternative; the United States, which relies so heavily on the same weapons, would view such a Russian move as bewildering and a sign of weakness or incompetence. If the United States were to unilaterally eliminate its ICBMs, states like Russia and China would almost certainly view it as an opportunity to advance their national interests at the expense of the United States, its allies, and its partners.

### **Summary**

Overall, eliminating ICBMs from the U.S. nuclear arsenal would only increase the value of the remaining strategic forces and present a darkly tempting opportunity for adversaries to permanently disable significant portions of the U.S. nuclear arsenal with only conventional forces. In

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<sup>61</sup> On this point, see Gray, *Missiles Against War*, op. cit., pp. 46-47.

addition, a U.S. nuclear force without ICBMs would be less resilient in the face of peacetime or wartime attrition. While critics often tout the possible fiscal savings if the United States eliminated its ICBM force, they fail to mention the significant costs that would be required to increase the survivability of the remaining nuclear forces. Other serious consequences of eliminating U.S. ICBMs include the increased risk to the remaining U.S. nuclear assets; the degradation of extended deterrence and increased risk of nuclear proliferation among allies that no longer feel secure; a loss of leverage in nuclear arms control discussions; fewer options should nuclear deterrence fail; and, potentially degraded U.S. credibility among states like Russia and China which retain ICBM-centric nuclear forces.

## Response to Criticisms of ICBMs and GBSD

GBSD's progression as a program has prompted a renewal of Cold War-vintage arguments against ICBMs as well as a number of novel arguments about particular characteristics of ICBMs and their contribution to deterrence. While this paper has addressed many of these points in the preceding sections, this final section is devoted specifically to some of the more recent criticisms of ICBMs and proposed alternatives to GBSD.

*Criticism: ICBMs are on "hair trigger" alert and liable to false alarms of incoming attack.*<sup>62</sup>

The term "hair trigger," as some critics frequently label ICBMs, is little more than a rhetorical scare tactic that

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<sup>62</sup> Examples of this argument or its variants include, Union of Concerned Scientists, "Taking Nuclear Missiles Off Hair-Trigger Alert," *Union of Concerned Scientists*, 2015, available at <https://www.ucsusa.org/sites/default/files/attach/2015/05/Hair-Trigger-Alert-Policy-Brief.pdf>.; Wright, Hartung, and Gronlund,

deserves no place in serious analytical debates. In common usage, a gun with a “hair trigger” is one that requires fewer pounds per square inch of pressure to cause the gun to fire than a standard trigger. This description does not fit the highly-scripted and controlled procedures for launching an ICBM. A recent Department of Defense fact sheet that addressed this issue deserves to be quoted in full:

In reality, ICBM operators are incapable of launching an ICBM without first receiving and confirming a number of criteria to verify and process a valid launch order from the President. Furthermore, to prevent unauthorized or accidental launches, ICBMs are locked day-to-day and cannot be enabled for launch without a code received in the valid launch order. In addition, a missile squadron is interconnected, meaning the five launch control centers (LCCs) monitor the status of all 50 ICBMs in that squadron and each other, and any one LCC will initiate “inhibit launch” commands in the event of unauthorized launch indications.<sup>63</sup>

The idea that U.S. ICBMs are on “hair trigger” alert has been debunked by both the Obama administration’s State

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*Rethinking Land-Based Nuclear Missiles*, op. cit., pp. 9-10.; Matt Korda, *Siloed Thinking: A Closer Look at the Ground-Based Strategic Deterrent* (Washington, D.C.: Federation of American Scientists, March 2021), p. 32, available at <https://fas.org/man/eprint/siloed-thinking.pdf>.; and, Matt Korda, “Congress Should Hit Pause On The New Intercontinental Ballistic Missile,” *Forbes*, April 21, 2020, available at <https://www.forbes.com/sites/matthewkorda/2020/04/21/congress-should-hit-pause-on-the-new-intercontinental-ballistic-missile/?sh=8de0071109a3>.

<sup>63</sup> U.S. Department of Defense, “The Importance of the Nuclear Triad,” op. cit.

Department and the Trump administration's Department of Defense.<sup>64</sup>

On the issue of false alarms, ICBMs themselves do not cause false alarms, nor will eliminating them from the U.S. nuclear arsenal eliminate the possibility of false alarms. The United States is investing heavily in a modernized nuclear command, control, and communications (NC3) system that is meant to, among other missions, accurately detect and track possible incoming threats to the United States. This system relies on dual-phenomenology, that is, agreement between ground- and space-based sensors that an attack is incoming before alerting senior officials. Importantly, the U.S. Department of Defense "... considers the broader political-military context in which it receives the data concerning a possible missile launch. Data that indicate a massive missile attack against the United States, when received in peacetime, will be given an extra level of scrutiny and confirmation to prevent mischaracterization."<sup>65</sup> In truth, it is a near-impossibility for the United States to mischaracterize a technical glitch as a massive Russian nuclear strike against U.S. ICBMs which would have a very specific attack profile as seen by ground-based radars and space-based satellites, especially by the time such information reaches the Secretary of Defense or president.

Again, as stated above, the U.S. president if presented with confirmed indications of a massive attack on U.S. ICBMs has the option to ride out the attack and need not launch ICBMs to "save" them. The important point is that U.S. military leaders can truthfully advise the president that

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<sup>64</sup> U.S. Department of State, "U.S. Nuclear Force Posture and De-alerting," *State.gov*, December 14, 2015, available at <https://2009-2017.state.gov/t/avc/rls/250644.htm>; and, U.S. Department of Defense, "The Importance of the Nuclear Triad," *op. cit.*

<sup>65</sup> U.S. Department of Defense, "The Importance of the Nuclear Triad," *op. cit.*

the United States can still achieve its objectives even if it lost every single ICBM – especially given the fact that the adversary will have, at best, likely used up more than half of its intercontinental-range nuclear weapons in the attack.

*Criticism: The United States has a “launch on warning” policy for its ICBMs.*<sup>66</sup>

Closely related to the above criticism about the possibility of false alarms, some critics state falsely that the United States has a “launch on warning” *policy*, as opposed to a “launch under attack” *option* for its ICBMs. As both the Obama and Trump administrations have pointed out, the United States does not have a “launch on warning” policy – that is, to launch its ICBMs based on the warnings and indications provided by a single sensor or system.<sup>67</sup> It is also important to note that the United States does not have a “launch under attack” *policy* either – that is, it is not U.S. policy to launch its ICBMs under attack, either through confirmed sensor data or through confirmed nuclear detonations. LUA is an *option* that does not have to be executed or even considered if a president does not want to.

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<sup>66</sup> Bruce G. Blair, Jessica Sleight, and Emma Claire Foley, *The End of Nuclear Warfighting: Moving to a Deterrence Only Posture* (Washington, D.C.: Global Zero, September 2018), p. 45, available at <https://www.globalzero.org/wp-content/uploads/2019/02/ANPR-Final.pdf>; and, Wright, Hartung, and Gronlund, *Rethinking Land-Based Nuclear Missiles*, op. cit., p. 8.

<sup>67</sup> U.S. Department of State, “U.S. Nuclear Force Posture and De-Alerting,” op. cit.; and, U.S. Department of Defense, “The Importance of the Nuclear Triad,” op. cit.

*Criticism: The vulnerability of ICBMs causes time pressure on the president to make a decision, which ultimately could be wrong.*<sup>68</sup>

While there will certainly be pressure on a president to make decisions during a confirmed attack, the president will not be forced into making a decision that he or she does not wish to make. If there were to be a massive attack on U.S. ICBMs, it is likely that the United States was already at war, perhaps even nuclear war, so there is a good chance that the president will have already been informed about the possibility of LUA and the options available in that contingency. As stated in a DoD fact sheet, “U.S. nuclear planners have specifically built in options to either absorb an initial first strike and respond effectively later, or to launch ICBMs while under a confirmed attack to preclude being disabled in a massive first strike.”<sup>69</sup> Thus, without diminishing the magnitude of the decisions made under pressure, the presumed pressure to launch U.S. ICBMs is not nearly so great as some critics declare it is given the viable alternatives.

*Criticism: ICBMs are destabilizing, can induce an adversary's attack, and ultimately the United States would suffer approximately the same amount of damage in a nuclear war with or without ICBMs.*<sup>70</sup>

The above arguments derive from the fact that U.S. ICBMs are land-based, immobile, and locatable – and thus, in some critics' estimation, a very tempting target for an adversary

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<sup>68</sup> Blair, Sleight, and Foley, *The End of Nuclear Warfighting*, op. cit., pp. 32-33.; and Korda, *Siloed Thinking*, op. cit., p. 32.

<sup>69</sup> U.S. Department of Defense, “The Importance of the Nuclear Triad,” op. cit.

<sup>70</sup> Korda, *Siloed Thinking*, op. cit., pp. 22-27.; Fred Kaplan, “The Missile Trap,” *Slate.com*, March 10, 2021, available at <https://slate.com/news-and-politics/2021/03/icbm-gbsd-missile-lobby.html>.



to attack either pre-emptively in a crisis or early on in a war. As Matt Korda states in a recently published report, "... if US-Russia deterrence fails, the non-mobile US ICBM force could invite the detonation of several hundred warheads across the Great Plains."<sup>71</sup> This line of thinking is curious for a number of reasons, not the least of which is that it is logically inconsistent.

This argument's proponents state that the U.S. nuclear submarine and bomber forces, which provide a guaranteed ability to respond after an attack, are enough to deter a nuclear attack. Yet the United States already has these capabilities, not just with its submarines and bombers, but with its ICBMs as well. It is logically inconsistent to think that a guaranteed response (submarines and bombers) will deter without inviting attack, but an even greater guaranteed response (submarines and bombers and ICBMs) *will not* deter and in fact invites massive attack. According to critics' logic – the ability to guarantee a response is what deters more than the speed of the response – the worst that ICBMs can be accused (falsely) of is being redundant to SLBMs, not inviting attack. In essence, one cannot logically hold that U.S. submarines and bombers are enough to deter any major nuclear attack, but with the addition of ICBMs, the U.S. nuclear force invites attack.

This argument also ignores the possibility that U.S. ICBMs can be launched under attack, so a potential adversary like Russia would hardly have an incentive to initiate a massive attack on the U.S. homeland – especially when it could not be guaranteed success. In short, this kind of argument implies that weapons cause war when in fact weapons do not cause war, political leaders do.

Finally, while nobody can predict with absolute certainty the detailed effects of a nuclear war – analysts in the military, government, and even pro-disarmament

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<sup>71</sup> Korda, *Siloed Thinking*, op. cit., p. 23.

groups have examined the possible consequences of targeting military assets (in a counterforce campaign) against targeting cities (in a countervalue campaign) and the simulated results are clear – a counterforce attack against military targets, especially U.S. ICBMs, will likely result in orders of magnitude fewer deaths than the same number of nuclear missiles being employed in an attack on U.S. cities. One analyst, in attempting to demonstrate that U.S. ICBMs are mostly irrelevant for the number of U.S. casualties in a major nuclear attack scenario, states, “... if either Russia or the United States launched a counterforce first strike against the other, the degree of national and international devastation would be so intense that it would ultimately matter very little where the aimpoints were located – whether near cities or in sparsely-populated areas.”<sup>72</sup> Yet in study after study, from the Cold War to the present day, this appears not to be the case at all.

For example, then-Secretary of Defense James Schlesinger testified to Congress in 1974 that if the Soviet Union utilized just over 1,000 one megaton warheads on the just over 1,000 U.S. ICBM silos, the resulting fatalities would be around 800,000 and casualties (fatalities and injuries and sickness) would be about 1.6 million.<sup>73</sup> In contrast, the total population of just one U.S. city at that time, New York City, was about 7,000,000 – or more than four times the projected casualties of a silo-only attack on the United States.<sup>74</sup> Similarly, the U.S. Office of Technology Assessment in 1979

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<sup>72</sup> Korda, *Siloed Thinking*, op. cit., p. 27.

<sup>73</sup> James Schlesinger as quoted in, U.S. Congress, *Briefing on Counterforce Attacks* (Washington, D.C.: U.S. Government Printing Office, hearing held September 11, 1974, and sanitized January 10, 1975), p. 13.

<sup>74</sup> On the New York City population, see, “Total and Foreign Born Population New York City, 1790-2000,” *NYC.gov*, no date, available at [https://www1.nyc.gov/assets/planning/download/pdf/data-maps/nyc-population/historical-population/1790-2000\\_nyc\\_total\\_foreign\\_birth.pdf](https://www1.nyc.gov/assets/planning/download/pdf/data-maps/nyc-population/historical-population/1790-2000_nyc_total_foreign_birth.pdf).

projected that an attack on U.S. ICBM silos alone could cause anywhere from 1-20 million fatalities depending on a range of conditions – a scenario that was based on the assumption that the Soviet Union employed over 2,000 nuclear warheads.<sup>75</sup> Again, those same 2,000 warheads if employed against U.S. cities would have produced far more fatalities. Finally, an independent pro-nuclear reductions non-governmental group conducted a similar study and found in their projections that a massive U.S. nuclear strike (~1,300 warheads) directed against each leg of the Russian nuclear triad would likely produce between 11-17 million casualties; while a far smaller nuclear countervalue attack (150-192 warheads) on Russian cities would produce around 50 million casualties.<sup>76</sup>

These studies support the near-inescapable conclusion that the nearly 500 aimpoints created by U.S. ICBMs in sparsely-populated areas would likely drastically reduce expected U.S. fatalities than if the same number of nuclear warheads were employed against the 500 most populated U.S. cities. Without ICBMs, the number of military targets in the United States would drastically decrease and, in the case of nuclear war, perhaps incentivize targeting U.S. cities earlier in a conflict than might otherwise be the case.

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<sup>75</sup> Office of Technology Assessment, *The Effects of Nuclear War* (Washington, D.C.: OTA, May 1979), pp. 86, 122, 123, available at <https://ota.fas.org/reports/7906.pdf>.

<sup>76</sup> Matthew G. McKinzie, Thomas B. Cochran, Robert S. Norris, and William M. Arkin, *The U.S. Nuclear War Plan: A Time for Change* (Washington, D.C.: Natural Resources Defense Council, June 2001), p. x, available at <https://www.nrdc.org/sites/default/files/us-nuclear-war-plan-report.pdf>.

*Criticism: The U.S. nuclear triad is not sacred and was not originally conceived to be a mutually supporting strategic concept.*<sup>77</sup>

Some ICBM opponents note that the U.S. nuclear triad was not originally conceived as such, but because of bureaucratic politics and infighting among the military services it became a widely used strategic concept. While it is true the U.S. nuclear triad, as a set of weapon systems, was not originally conceived as mutually-supporting capabilities, it does not then follow that the triad has no such value. All throughout military history, governments have invested in research and development to create new technologies of war that – if useful – military planners then attempt to incorporate into current military doctrine and tactics. Even given the fact that the U.S. Army, Navy, and Air Force all had budgetary incentives to operate a part of the U.S. nuclear arsenal during the Cold War, that has no bearing on whether the triad today has utility. Clearly the vast majority of former Commanders of U.S. Strategic Command, and its predecessor Strategic Air Command, support modernizing the triad in general and ICBMs in particular – evidence that the triad retains support within the military, not to mention the bipartisan executive and legislative commitment to the triad post-Cold War.<sup>78</sup>

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<sup>77</sup> Korda, *Siloed Thinking*, op. cit., p. 19.; Benjamin Friedman, Christopher Preble, and Matt Fay, *The End of Overkill? Reassessing U.S. Nuclear Weapons Policy* (Washington, D.C.: Cato Institute, 2013), pp. 2-12, available at

[https://www.cato.org/sites/cato.org/files/pubs/pdf/the\\_end\\_of\\_ove\\_rkill\\_wp\\_web.pdf](https://www.cato.org/sites/cato.org/files/pubs/pdf/the_end_of_ove_rkill_wp_web.pdf); and, Kaplan, “The Missile Trap,” op. cit.

<sup>78</sup> C. Robert Kehler, Larry D. Welch, James O. Ellis Jr., Kevin P. Chilton, Cecil D. Haney, Henry G. Chiles, Eugene E. Habiger, and Richard W. Mies, “The U.S. Nuclear Triad Needs an Upgrade,” *The Wall Street Journal*, January 11, 2017, available at <https://www.wsj.com/articles/the-u-s-nuclear-triad-needs-an-upgrade-1484179459>.

*Criticism: The United States does not need GBSD because Minuteman III can be life-extended for less money with little or no resulting loss in capability.*<sup>79</sup>

Proponents of MM III (further) life extension argue that there is no pressing need to procure GBSD and that MM III can continue to perform the traditional ICBM missions at a lower cost. There are, however, two inter-related issues with life extending MM III once again. First, as indicated above, GBSD will not only replace the missiles themselves, but many of the other communication and security systems that comprise the whole program. As STRATCOM Commander ADM Richard stated, "Both Minuteman III and Ground-Based Strategic Deterrent are weapon systems which includes [sic] the command and control that goes with those systems. And part of what gets modernized with GBSD is its command and control."<sup>80</sup> MM III life extension proponents may respond that part of the life extension program can include upgrades to cybersecurity and command and control as well, yet at that point, the military would be patching new components onto an old system instead of integrating parts that were specifically made for each other. In other words, there are obvious issues with creating a patchwork of upgrades to the MM III ICBM that would need validation through testing to make sure they work as planned.

Extensive testing, however, is the crux of the second problem with life-extending MM III. There are simply not enough missile bodies remaining for the United States to continue its rate of testing and not affect the deployed arsenal of ICBMs. Proponents of MM III life extension

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<sup>79</sup> Korda, *Siloed Thinking*, op. cit., pp. 91-106.; and, Hinck and Vaddi, "Setting a Course Away from the Intercontinental Ballistic Missile," op. cit.

<sup>80</sup> Richard, "Defense Writers Group," op. cit.

believe, however, that the United States can reduce its rate of testing to save on missile bodies – yet reducing the rate of testing at a time of significant life extension efforts runs the risk of limited data and decreased confidence in reliability. As the authors of the RAND report that studied the future of the U.S. ICBM force state, “While we did not explore whether the current testing requirements could be relaxed, caution should be exercised because reducing the number of tests could limit engineering-level assessments of the effects of aging and the effects of combining new parts with existing parts in any SLEP.”<sup>81</sup>

Some may say that such a risk is worth taking given the funds at stake, but given the relatively small difference in price between a significant life extension of MM III (and subsequent delay in procuring GBSD) and the price of procuring GBSD now, there is much to commend the course of action that spends only slightly more for a more capable, less risky system.<sup>82</sup> In 2017, the Congressional Budget Office (CBO) studied the possibility of life extending MM III and delaying GBSD by 20 years so that it would begin production in 2044. Under this option, the United States, CBO estimated, would save about \$18 billion over the 2017-2046 time period.<sup>83</sup> To put this number in perspective, if one were to very conservatively assume a total Department of Defense budget of \$700 billion on average annually over the next 30 years, this same \$18 billion would amount to less than one one-thousandth of one percent over that same time period. Put another way, \$18 billion spread out over 30 years averages out to about \$600 million a year, or less than one tenth of one percent of the average annual defense

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<sup>81</sup> Caston, Leonard, Mouton, et. al., *The Future of the U.S. Intercontinental Ballistic Missile Force*, op. cit., p. xviii.

<sup>82</sup> For an example on acceptable risk, see, Hinck and Vaddi, “Setting a Course Away from the Intercontinental Ballistic Missile,” op. cit.

<sup>83</sup> Congressional Budget Office, *Approaches for Managing the Costs of U.S. Nuclear Forces*, op. cit., p. 30.

budget. In many ways then, further life extension of MM III appears to be penny wise, but pound foolish.

## **Conclusion – The Value of ICBMs in the Nuclear Triad**

The study of nuclear weapons and their possible employment in a conflict is necessarily, and thankfully, speculative and a study in unknowns. When dealing with the unknown, however, it is best to be armed with many options – different tools for different purposes. As the late strategist Colin S. Gray stated, there is “safety in diversity.”<sup>84</sup> The U.S. nuclear triad is a diverse set of tools, each mutually supporting the other in peace and in war. As part of that diversity, ICBMs are an indispensable tool in U.S. defense strategy – especially in their traditional priority roles of contributing to deterrence, assurance, achieving objectives should deterrence fail, and hedging against the unpredicted and unpredictable. ICBMs contribute to deterrence of nuclear and non-nuclear strategic attack through their assured connectivity, responsiveness, promptness, in-flight survivability, and difficulty to target. In assurance and extended deterrence efforts, ICBMs are unique in that they provide the ultimate backstop to nuclear escalation – helping convince allies that the United States can deter major attacks on its homeland – and offer prompt options and targeting flexibility should deterrence fail in defense of an ally or partner. Should deterrence fail and the president of the United States feels the need to respond, ICBMs can help the United States achieve its objectives through their assured connectivity, known payload, ballistic flight paths, and targeting flexibility. ICBMs also act as a hedge against geopolitical, technical, operational, and programmatic risk. Other additional valuable attributes

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<sup>84</sup> Gray, *Missiles Against War*, op. cit., p. 45.

include the relatively low cost to operate, maintain, and modernize ICBMs; their lengthy expected service lives; and their ability to possibly contribute to positive nuclear arms control outcomes for the United States.

Many MM III ICBMs will be over 50 years old when they are retired and replaced by GBSD – thus GBSD will be a “just in time” modernization program that not only replaces the missile, but upgrades subcomponents such as the launch control centers, maintenance practices, cybersecurity, and NC3 components. GBSD will also incorporate a modular design that will allow for easier upgrades in security and survivability in the future should requirements change.

Yet even with these future capabilities and their importance for deterrence, some critics still advocate for eliminating ICBMs from the U.S. nuclear arsenal. Doing so, however, could increase the likelihood of a significant attack on U.S. strategic forces, cause severe damage to the resiliency of the U.S. nuclear force against attrition, increase defense costs, and increase risk to the remaining legs of the U.S. nuclear triad. Additionally, without ICBMs in the U.S. nuclear force, U.S. allies and partners would likely be less assured of U.S. commitments and could pursue their own nuclear capabilities; the United States would have less leverage in arms control negotiations; there would be fewer options available to the president should deterrence fail; and finally, states such as Russia and China that have ICBM-centric nuclear arsenals would likely perceive the United States as either weak or foolish – thus possibly increasing the risk of Russian or Chinese aggression against U.S. interests.

Arguments that U.S. ICBMs are on “hair trigger alert” with a “launch on warning” policy are simply fallacious. Arguments that presidents will face decision-making pressure while under attack, while true, need to be placed in the context of the other valid and perhaps more attractive



options that a president will also have available. Other arguments, such as ICBMs inducing preemptive attack and the triad being born of bureaucratic infighting, are illogical and irrelevant respectively. Finally, the argument that MM III should be life extended either to delay GBSD or substitute for it has the virtue, in the best case scenario, of being technically possible, but strategically such a move would invite far too much risk for far too little savings.

The U.S. nuclear triad, as critics rightly point out, is not sacred – no U.S. defense program should be. If a program cannot withstand close scrutiny as to its purpose, capabilities, and viability – it can and should be scrapped. Critics have subjected ICBMs in general, and GBSD in particular, to intense scrutiny – and yet the program remains a bipartisan priority for modernization. This indicates that there is yet much strategic value in ICBMs now and for the future. Policy-makers must therefore closely consider the implications of reducing or eliminating a capability that their predecessors, over time and different threat environments, and across the political spectrum, have deemed a vital requirement for U.S. security. There is indeed “safety in diversity” and ICBMs should be allowed to continue uniquely contributing to U.S. and global security.

## *About the Author*

Matthew R. Costlow is a Senior Analyst at the National Institute for Public Policy. His areas of expertise are in nuclear deterrence, missile defense policy, arms control, and Russian and Chinese nuclear doctrine. His work has been published by *Comparative Strategy*, *Strategic Studies Quarterly*, and the *Bulletin of the Atomic Scientists*. He has also published numerous opinion pieces in the Institute's *Information Series* as well as the *Wall Street Journal*, *War on the Rocks*, *Defense News*, and *Defense One*.

While working for the National Institute, Matt graduated in 2012 from Missouri State University with an M.S. in Defense and Strategic Studies. His thesis, "Gunboat Diplomacy in the South China Sea" was chosen for publication at the U.S. Air Force Institute for National Security Studies. He is currently a PhD candidate in Political Science at George Mason University and is writing his dissertation on the factors that influence the credibility of WMD declaratory policy.

From 2019-2021, Matt served as a Special Assistant in the office of Nuclear and Missile Defense policy, Department of Defense. His responsibilities included authoring and editing Congressional testimony for senior leadership on nuclear and missile defense topics, writing reports to Congress, drafting speeches to domestic and foreign audiences, and ensuring strategic communications were consistent with official U.S. government policy. While at the Pentagon, Matt also briefed numerous senior officials up to the Under Secretary of Defense for Policy, explained U.S. policy to multiple allied delegations, and produced nuclear-themed tabletop exercises. For these and other accomplishments, Matt was presented with the Office of the Secretary of Defense Award for Exceptional Public Service.

From 2012-2019, Matt worked as an Analyst at National Institute, specializing in many of the same areas he currently writes on. Before 2012, he researched cybersecurity, emergency management, and foreign airpower acquisition at the Congressional Research Service. Prior to that, he worked at SAIC on federal and state emergency management best practices.



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