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The Case for the US ICBM Force

Matthew Kroenig

Abstract

Since the 1960s, intercontinental ballistic missiles (ICBM) have been a central element of America's nuclear triad. In recent years, however, ICBMs have come under increasing attack. Prominent critics charge they are unnecessary for deterrence, they undermine nuclear strategic stability, and the cost of modernization is unaffordable. This article argues that these criticisms are misguided. Far from unnecessary, ICBMs possess a number of distinctive attributes that contribute to core objectives of US nuclear strategy, including the deterrence of nuclear attack, assurance of allies, and achieving US objectives should deterrence fail. Moreover, the argument that ICBMs are destabilizing rests on a logical contradiction and is inconsistent with the empirical evidence. Finally, while the cost of ICBM modernization is substantial, it is also affordable. This more careful analysis demonstrates that ICBMs contribute to US national security and should remain a core part of America's strategic deterrent.

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Since the 1960s, intercontinental ballistic missiles (ICBM) have been a central element of America's nuclear deterrent. Along with submarines and bombers, these long-range, ground-based missiles constitute one of the three legs of America's nuclear triad. The United States currently deploys 400 ICBMs in missile fields in Montana, North Dakota, and Wyoming, with another 50 silos "kept warm" for possible missile upload if necessary.[1] Although the ICBM force has been greatly reduced since the end of the Cold War, it remains a major component of the US nuclear triad. The Minuteman III missile (in operation since 1970) has

Matthew Kroenig is associate professor of government and foreign service at Georgetown University and deputy director for strategy in the Scowcroft Center for Strategy and Security at the Atlantic Council. His most recent book is *The Logic of American Nuclear Strategy* (Oxford University Press, 2018).

exceeded its expected service life, however, and there is a widespread recognition that it must be replaced. In 2010, the Obama administration announced plans to modernize the country's nuclear forces, including ICBMs, over the next 30 years. The plan for a new ICBM, the ground-based strategic deterrent (GBSD), calls for the acquisition of 400 to 450 new missiles to be deployed in the late 2020s at an estimated price tag of $149 billion.[2] The Trump administration has declared its intention to follow through with Obama's modernization plans, which enjoys mainstream bipartisan support. In 2016, for example, then-Secretary of Defense Ashton Carter, speaking just steps from a missile field in North Dakota, declared that the nuclear triad, including the ICBM force, remains "the bedrock of our security."[3]

For decades, Republican and Democratic administrations have agreed that ICBMs were necessary for US nuclear deterrence. At the end of the Cold War, scholars debated whether the United States and Russia could jointly negotiate to eliminate all ballistic missiles, but those proposals never came to fruition.[4] In recent years, America's nuclear missiles have once again come under attack, but, in contrast to earlier debates, critics now claim that the United States should eliminate them unilaterally, since there is scant hope that Russia will do the same. Prominent advocates of this form of unilateral disarmament, including former Secretary of Defense William Perry and former Commander of US Strategic Command James Cartwright, argue that ICBMs are unnecessary for deterrence because the other elements of America's nuclear arsenal, namely bombers and submarines, are more than sufficient to provide the United States with an assured retaliation capability.[5] They also charge that ICBMs could be destabilizing in a crisis, giving rise to first-strike incentives and increasing the risk of accidental nuclear war.[6] Finally, they argue that the projected costs of modernization make them unaffordable and the United States can, therefore, save significant sums in the defense budget by canceling modernization plans and shedding this leg of the nuclear triad.[7]

These criticisms are misguided. There are valid reasons why ICBMs have remained a prominent feature of America's nuclear force for several decades. Far from unnecessary, ICBMs possess a number of distinctive attributes that contribute to key goals of US nuclear strategy, including the deterrence of enemies, assurance of allies, and the achievement of US objectives in the event deterrence fails.[8] ICBMs increase the dif-

ficulty of a successful nuclear first strike on the United States and contribute to limiting damage to the United States and its allies should conflict erupt. In addition, a US decision not to modernize the ICBM force could cause America's more than 30 treaty allies to question the US commitment to, and credibility of, extended deterrence. Moreover, the other objections raised by detractors do not hold up under scrutiny. The argument that ICBMs are destabilizing rests on a logical contradiction and is inconsistent with the empirical evidence. Finally, while the cost of ICBM modernization is substantial, it is also affordable. If one agrees with Secretary of Defense James Mattis, therefore, that maintaining an effective nuclear deterrent is the "number one priority of the Department of Defense," then ICBM modernization is also a good value.[9] This more careful analysis demonstrates that ICBMs contribute to US national security and should remain a core part of America's strategic deterrent.

This is not the first defense of America's ICBM force, but it goes beyond existing arguments in a number of ways.[10] First, the article provides a new articulation of the theoretical contradiction at the heart of critics' core arguments about strategic stability. Second, it provides a novel explanation and quantification of how ICBMs contribute to damage limitation. Third, it presents original evidence in support of the ICBM assurance mission. Finally, and most broadly, explanations for America's continued reliance on ICBMs must be updated in light of changing international conditions and to address a new and evolving set of criticisms.

This article will provide a review of debates about a "zero ballistic missile regime" in the immediate post–Cold War era. Next, it examines contemporary criticisms of US ICBMs and presents the case for the ICBM force, including a point-by-point rebuttal of the opponents. The article concludes with the implications of this analysis for scholarship on nuclear deterrence and US nuclear policy.

A Zero Ballistic Missile Regime

Although ICBMs have been a core part of America's nuclear deterrent for decades, the end of the Cold War created a belief that it might be possible for the United States, Russia, and other nuclear powers to eliminate all ground-based ballistic missiles.[11] Some even went further and argued that submarine-based ballistic missiles might also be placed on the chopping block.[12] In 1987, the United States and Russia did manage to negotiate the Intermediate Range Nuclear Forces Treaty (INF),

eliminating all intermediate-range (those with ranges from 500–5,000 km) missiles.[13] But, in the end, a complete zero ballistic missile regime (ZBM) proved beyond reach.

Proponents of a ZBM argued that ballistic missiles were exceptionally destabilizing.[14] Since they can be launched promptly, are not recallable, and are fast flying, they reduce time for decision making in a crisis and raise the risk of miscalculation. Moreover, their hard-target kill capability made them potentially attractive to aggressors contemplating a nuclear first strike. In contrast, a world with nuclear forces deployed only on slower-flying cruise missiles and aircraft (the latter of which can also be recalled) would improve crisis stability. Advocates also maintained that, since the United States enjoyed a technological edge over the Soviet Union in bombers and cruise missiles, American strategic superiority would be enhanced in a world without ballistic missiles.

Critics countered that Moscow was unlikely to agree to any such proposals precisely because they would cede a strategic advantage to Washington.[15] Moreover, they maintained, such an arrangement would simply produce a new arms race in bombers and cruise missiles that could be even more destabilizing than a world with ballistic missiles. After all, an ICBM launch at least provides an enemy with approximately 30 minutes of warning, but a nuclear detonation conducted with stealthy aircraft or cruise missiles of the future could occur before the targets of the attack even knew what hit them. Finally, critics argued that as long as nuclear weapons were also intended to deter large-scale conventional, not just nuclear, conflict, then the threat of prompt retaliation provided by ICBMs was necessary. In this view, the "instability" produced by ICBMs was at least partly an advantage, not limitation.

Still, proponents produced detailed proposals about how negotiations toward a ZBM could begin between the superpowers and then expand over time to include regional nuclear-armed states until the goal of zero ballistic missiles was finally achieved.[16] Debates in the immediate post-Cold War about worldwide ballistic missile elimination reflected an optimism about the future security environment that does not exist today.[17] The nuclear threat environment has deteriorated over the past several years, and great power political competition has returned. Moreover, even in the heady days of the early 1990s, eliminating ICBMs proved impossible. Nevertheless, arguments about ICBM elimination have recently returned. This time, however, proponents do not argue that the

risk is a deliberate Russian nuclear first strike but that the United States might use its ICBMs first by accident. Moreover, they maintain that the United States should unilaterally disarm, even if there is little prospect of Russia following suit.[18]

ICBMs Under Renewed Attack

Plans to maintain or modernize the ICBM force have come under renewed attack in recent years, despite ICBMs' long pedigree and broad bipartisan political support. Prominent critics charge that ICBMs are unnecessary for deterrence, that they undermine nuclear strategic stability, and that their modernization costs are unaffordable.

Unnecessary for Deterrence

Tom Collina, policy director for the Ploughshares Fund, argues that the ground-based strategic deterrent is redundant and unnecessary for nuclear deterrence since the United States already has "enough nukes on subs to deter any potential attacker."[19] He and other critics argue that because the other two legs of the triad are sufficient to deter any enemy nuclear attack, the ICBM force is expendable. They maintain that since a new strategic bomber will be necessary for conventional missions, its modernization is guaranteed.[20] They further stipulate that submarine-launched ballistic missiles (SLBM), deployed on submarines at sea, are survivable. ICBMs, on the other hand, located in fixed and known locations, are vulnerable to an enemy nuclear first strike.[21] Moreover, since ICBMs contain an older guidance system than SLBMs, they are also less accurate, rendering them less useful for counterforce targeting and increasing the potential for unnecessary collateral damage.[22] Finally, they maintain, SLBMs and bombers can carry sufficient nuclear firepower to impose unacceptable costs on an adversary. Given these considerations, critics conclude that the ICBM force is unnecessary. As journalist Fred Kaplan put the argument in *Foreign Affairs*, "the case for land-based ICBMs today is extremely weak."[23]

Undermine Nuclear Strategic Stability

The second charge against the ICBM force is that it undermines nuclear strategic stability and increases the risk of accidental nuclear war. For decades, the United States has maintained a launch under attack (LUA)

option.[24] Since ICBMs in fixed silos are potentially vulnerable to an enemy nuclear first strike, the United States announces that it will not wait to have its missiles destroyed but, instead, reserves the right to launch ICBMs upon receiving warning of an incoming attack. The LUA option is meant to contribute to deterrence by making it clear to adversaries they cannot count on destroying the US ICBMs in their silos, even if they strike first. However, ICBM critics charge—pointing to historical near misses—that this policy could lead to accidental nuclear war.[25] As Perry argues, "These missiles are some of the most dangerous weapons in the world. They could even trigger an accidental nuclear war."[26] And Perry and Cartwright aver that these are "higher risks of accidental war that, fortunately, we no longer need to bear."[27] A false alarm could cause a US president to launch a nuclear war under the mistaken belief that a nuclear war has already begun. To avoid this danger altogether, therefore, ICBM critics advocate eliminating ICBMs. Since submarines at sea are less vulnerable to a nuclear first strike and bombers can be sent into the air in a crisis, the pressures to "use them or lose them" are less intense. Detractors maintain that the risks of having ICBMs on "hair-trigger alert" are simply too great.[28]

Unaffordable

The final argument for eliminating the US ICBM force is that they are too expensive. Again, as Perry and Cartwright believe, "we are safer without these expensive weapons, and it would be foolish to replace them."[29] The Congressional Budget Office estimates that the price tag of modernizing America's nuclear triad over the coming 30 years will come to over $1 trillion.[30] This is a large sum, and those opposed to nuclear modernization argue that the United States can save money by scaling back its plans, including delaying modernization of, or scrapping altogether, the ICBM force.[31] In addition, critics argue that allocating large sums to nuclear forces takes away from investment in other more useable conventional military capabilities. For example, Collina argues that "avoiding production of a new ICBM would save tens of billions."[32] Perry maintains that the US modernization plan "is needlessly oversized and expensive" and will "crowd out the funding needed to sustain the competitive edge of our conventional forces and to build the capacities needed to deal with terrorism and cyberattacks."[33] Instead, Perry and

Cartwright maintain, Washington "should cancel plans to replace its ground-based ICBMs, which would save $149 billion."[34]

The Case for the ICBM Force

Contrary to the above claims, ICBMs are a necessary part of US nuclear strategy. They contribute to US nuclear strategy, do not undermine strategic stability, and are affordable. The analysis below shows that ICBMs should continue to occupy an important role in US nuclear posture.

ICBMs Are Necessary for US Nuclear Strategy

ICBMs possess a number of unique attributes that strengthen nuclear deterrence overall. They not only provide deterrence against attack on the United States, but they also contribute to other roles and missions, including assuring allies and achieving US objectives if deterrence fails.

Launching a successful nuclear first strike on a United States armed with hundreds of ground-based ballistic missiles in hardened silos spread throughout the interior of the country would be a near-insurmountable task. Without ICBMs such a first strike would be much easier to contemplate. This fact has long been recognized and has sometimes been described as the "sponge" or "warhead sink" argument for ICBMs.[35]

The existence of an ICBM force greatly raises the opening ante for a nuclear first strike on the United States. Major nuclear powers, like Russia and the United States, include counterforce nuclear targeting in their war plans.[36] In other words, they plan to use their nuclear weapons to destroy an enemy's nuclear weapons. The more enemy nuclear weapons that can be destroyed, the fewer that will land in retaliation on one's own territory. An adversary plotting a counterforce nuclear first strike on the United States would need to target at least 455 sites on the US mainland. This list of targets includes three strategic bomber bases in Louisiana, Missouri, and North Dakota and two strategic submarine bases in Georgia and Washington state.[37] Finally—and most importantly—the enemy would need to target and attempt to destroy 450 separate ICBM silos spread across hundreds of miles in Wyoming, North Dakota, and Montana. There are many other targets an enemy might also seek to destroy in a first strike, including those related to nuclear command and control, missile defense sites, war-sustaining industries, and others. But the bare minimum for a splendid first strike on US nuclear forces at

present requires destroying at least 455 targets. That is a daunting, if not impossible, objective, even for a major nuclear power like Russia.

The attempt would require an adversary to expend much of its nuclear arsenal. To ensure the destruction of a target, it is believed that states would want to allocate more than one warhead to each aim point; a common rule of thumb is two warheads per target.[38] An enemy nuclear strike on 450 hardened ballistic missile silos in the United States, therefore, would require the enemy to generate an offensive force package of approximately 900 nuclear warheads. Such an operation is simply not possible for two of America's three nuclear adversaries. China and North Korea are believed to possess arsenals numbering around 260 and 30–60 nuclear warheads, respectively.[39] While feasible for Russia, with its larger number of nuclear weapons, it would still require Moscow to expend roughly two-thirds of its deployed, strategic nuclear arsenal in a bid to destroy US ICBMs.[40]

It is difficult to imagine an adversary deciding to intentionally launch a nuclear first strike on the United States under these conditions. The attack would require detonating nearly one thousand nuclear weapons on hundreds of sites spread throughout the US homeland. It would be impossible to keep such a strike limited. There is a reasonable chance it would not succeed in destroying every target, and a US president would be compelled to respond. These considerations strengthen nuclear deterrence.

Subtract the ICBMs from this equation, however, and the picture greatly changes. Adversaries could concentrate their efforts on the remaining two legs of the triad. The opening ante for a nuclear attack on the United States plummets to only five sites. The number of nuclear weapons needed to cover these targets collapses to a mere 10 nuclear warheads. This greatly lowers the bar for nuclear deterrence. With a target set this small, Russia and China could conduct a first strike and still hold hundreds of nuclear warheads in reserve. Even a minimally armed rogue state such as North Korea could contemplate such an attack.

To be sure, even if an enemy attempted such an attack, the United States would retain a retaliatory nuclear force. The enemy might fail to destroy every target and US nuclear submarines on deterrence patrol would survive. This remaining force, however, would be diminished. Moreover, the enemy could attempt to combine the nuclear first strike with an antisubmarine warfare campaign, missile defense intercepts, and other efforts intended to deny America's retaliatory capability. In this

condition, the enemy might be tempted to conduct an attack and use its remaining nuclear forces to "deter our deterrent."[41] While an intentional enemy nuclear first strike on the United States would remain highly unlikely, it would undoubtedly be easier to plan and execute in the absence of a US ICBM force.

Some ICBM critics, including Fred Kaplan, recognize the value of ICBMs as a warhead sink, but they maintain that such a function could be served at much lower numbers, such as one dozen ICBMs.[42] This is a subject worth more serious discussion. Greatly reducing ICBM numbers, however, would begin to undermine the ICBM's deterrence function. Reducing numbers would make an enemy first strike more effective, allow larger adversaries to consider a nuclear first strike while holding a larger nuclear force in reserve, and place a first strike within reach for smaller powers, such as North Korea. Most importantly, deep ICBM reductions conflict with another important US goal: achieving its objectives if deterrence fails.

In addition, eliminating the US ICBM force may also weaken deterrence by encouraging adversaries to initiate or escalate crises against the United States and its allies, thus increasing the risk of a nuclear crisis and nuclear war. The debate continues over whether nuclear superiority is useful for deterrence and coercion—with many scholars arguing superiority does not matter. Recently one side of the argument finds that nuclear superior states are more likely to initiate militarized compellent threats against other nuclear-armed states and more likely to achieve their goals in high-stakes crises.[43] If the United States were to unilaterally eliminate its ICBM force, as some ICBM critics advocate, it would cede a large nuclear advantage to Russia, possibly increasing Moscow's willingness to challenge the United States and its allies in dangerous militarized disputes.[44]

Finally, the nuclear force envisioned in the current round of modernization efforts will need to last decades. Modern ICBMs will help ensure against potential technological breakthroughs that could soon make the seas more transparent, calling into question the survivability of the sea-based leg.[45] It would be unwise, therefore, for US nuclear strategy to depend on the assumption that nuclear-armed submarines will always be survivable. In sum, the US ICBM force strengthens nuclear deterrence, but not only for the US.

ICBMs also play a crucial role in extending deterrence and assuring US allies. The United States aims not only to deter attacks on itself but also to extend deterrence to over 30 allies and partners in Europe and Asia. The US nuclear umbrella helps maintain stability in important geographic regions and dissuades allies from taking steps that would be contrary to US interests, such as building independent nuclear arsenals.[46]

ICBMs have a number of positive attributes that can contribute to extended deterrence and assurance, including promptness and reliability. Unlike other legs of the triad, ICBMs are always on alert, and they can promptly strike any target on Earth in 30 minutes or less. Bombers and nuclear-capable fighter aircraft require hours to reach an intended target. SLBMs also generally take more time, depending on their position. Moreover, ICBMs are also the most reliable leg of the triad. There could conceivably be issues communicating to submarines at sea or bombers in flight, but the ground-based deterrent, securely located within the US homeland, possesses the most assured command and control links, allowing it to reliably receive and respond to launch orders.[47]

One can debate the value of these attributes, but America's security partners are the final arbiters of what policies, strategies, and capabilities they find reassuring, and they have consistently voiced support for the maintenance and modernization of the US ICBM force. Jacek Durkalec, a Polish defense expert, argues, "it is hard to imagine that without the ICBM force, the US would be able to maintain a parity in strategic forces with Russia."[48] He worries that this could undermine strategic stability, embolden Russia to behave more aggressively, and reduce Moscow's incentives to negotiate future arms control agreements. Most importantly, he is concerned that "if the US eliminates its ICBMs while Russia retains similar capabilities, this might improve Russia's psychological position to blackmail US allies."

Sugio Takahashi, a leading Japanese nuclear expert, argues that ICBMs are critical for the US ability to extend deterrence to Japan.[49] He maintains that to credibly extend deterrence, the United States must maintain a capability for nuclear preemption against North Korea, to physically protect Tokyo from any imminent nuclear attack. If the United States and Japan had credible evidence that Pyongyang were on the verge of mounting an attack, US nuclear-armed aircraft would be unlikely to arrive in time and Tokyo could not be certain about the position of SLBMs, but they would be assured that US ICBMs could arrive in less

than a half hour. In his view, the promptness and reliability of the ICBM contribute to assurance.

South Korean experts also see ICBMs as a critical component of extended deterrence and assurance. James Kim, a research fellow at the Asan Institute for Policy Studies in Seoul, has stated, "I do not see how one can make the case that the security interests of the US and its allies can be protected without a fully functioning and capable nuclear arsenal, including ICBMs."[50] He continues, "ICBMs are not the only requirements of extended deterrence, but they are necessary."

Moreover, there is the additional question of how a US decision to shed a leg of the nuclear triad would be interpreted around the world. Deterrence theorists argue that many threats and promises in international politics are nothing more than "cheap talk," but that states can signal credibility by "sinking costs."[51] In other words, threats and promises are more believable if states back up their words, by putting money where their mouths are. Investing billions to modernize the ICBM force sends a clear and "costly signal" of the US commitment to nuclear deterrence. If, on the other hand, the United States cancels plans to modernize its nuclear forces, allies may question whether Washington remains committed to the extended nuclear deterrence mission.[52] As Kim argues, "a significant portion of the South Korean public has begun to question the strength of US security guarantees. One way the United States can address this challenge is by continuing to update and strengthen force readiness and defense modernization. ICBM modernization is part of this process."[53]

Finally, ICBMs can save millions of American lives. This may be the most important role of US ICBMs. While many nuclear strategists focus exclusively on deterrence, policy makers must also consider what happens if, God forbid, deterrence fails.[54] The 2018 *Nuclear Posture Review* sets out "achiev(ing) US objectives should deterrence fail" as one of four major roles of US nuclear weapons. It explains that "US nuclear policy for decades has consistently included this objective of limiting damage if deterrence fails."[55] The maintenance of an ICBM force greatly contributes to America's damage limitation capability.

To explain this point, consider hypothetical nuclear exchanges between the United States and Russia. First, imagine that Russia conducts a nuclear first strike against the United States. As stated above, it is believed that Russia's nuclear strategy calls for counterforce strikes. In addition, it is

also believed that, in the event of a large-scale nuclear exchange, Moscow would use remaining forces for countervalue attacks aimed to maximize destruction to the US homeland or as bargaining leverage to end the conflict on its terms.[56] With a US ICBM force in place, Russia would need to allocate 900 nuclear warheads to destroying US ICBM silos. Again, this is why US ICBMs are sometimes referred to as a "warhead sink." If, however, the US ICBMs were eliminated, these 900 nuclear weapons would be available to attack other targets, including countervalue targets affecting hundreds of additional US population centers. Conducting detailed nuclear exchange calculations, I estimate that a Russian nuclear first strike on the United States with an ICBM force in place would result in 70 million US casualties.[57] With the ICBM force removed, this figure rises to approximately 125 million casualties. To argue, therefore, that the United States can safely eliminate ICBMs, one would have to maintain that it does not matter whether 55 million Americans live or die in the event of a Russian attack. This may be an acceptable cost to some, but the history of US nuclear strategy has shown that policy makers responsible for protecting American lives prefer a plan that limits damage if deterrence fails. They are not comfortable needlessly risking tens of millions of additional American lives in the event of enemy nuclear attack.

Indeed, the United States could strengthen damage limitation by increasing its number of ICBMs. This would reduce the adversary's warheads available for urban strikes, and the 2:1 shot ratio would force the opponent into an unfavorable cost position.

The result is similar if we consider a situation in which the United States strikes first with a large-scale nuclear attack. This scenario is unlikely but possible, if, for example, Russia launched a major conventional attack, a major nonnuclear strategic attack, or a limited nuclear attack against the United States or its allies. With ICBMs, the United States possesses 400 nuclear warheads it can use in counterforce strikes on Russia's nuclear forces. At two offensive warheads for every counterforce target, this would result in the destruction of up to 200 Russian nuclear weapons-related targets before those weapons could be used against US or allied territory. In contrast, if the United States eliminated its ICBMs, it would have fewer forces with which to blunt Russia's nuclear retaliatory capability. Indeed, if the United States were to eliminate ICBMs, Washington might need to consider abandoning counterforce targeting

and the damage limitation element of its strategy altogether. Assuming, however, that the United States persisted with a counterforce targeting strategy even without ICBMs, the US ability to limit damage would be greatly reduced. By my calculation, a Russian second strike on the United States, following a US first strike that included ICBMs, would result in 28 million US casualties. In contrast, the same scenario without US ICBMs would cause 82 million casualties. The difference is once again approximately 50 million American lives.

The United States can reduce its number of ICBMs as some critics suggest or eliminate them altogether, but for every US ICBM it cuts, it may expose additional American lives to the threat of direct nuclear attack. The existence of the ICBM force, therefore, can contribute to the goal of damage limitation.

ICBMs Do Not Undermine Nuclear Strategic Stability

Not only do ICBMs contribute to US nuclear strategy, they also do not undermine nuclear strategic stability as critics claim. Above, we saw how ICBMs contribute to the deterrence of US adversaries and, therefore, to strategic stability. To be sure, there is always some risk of accident involved with nuclear weapons, but the United States practices a number of safeguards to reduce the risks of an accidental nuclear launch. For example, the United States practices broad open ocean targeting, which would reduce the implications of any accident.[58] On balance, therefore, there is good reason to believe that ICBMs do more to contribute to stability than to undermine it.

But critics have recently argued that ICBMs increase the risk of accidental nuclear war, are destabilizing in the event of an impending nuclear attack, and therefore should be eliminated. This claim, however, rests on a logical contradiction and is inconsistent with decades of empirical evidence. Critics maintain that a US president would want to launch ICBMs before they could be wiped out in an enemy first strike. This pressure to act quickly increases the risk that the president could launch an accidental nuclear war due to a false alarm. But this argument raises the question: why is the president so eager to use ICBMs before they can be eliminated? Presumably, because the president believes that using ICBMs is critical for the United States to achieve its objectives. Indeed, this unstated objective must be fairly important if the president is willing to run a possible risk of launching an accidental nuclear war to

achieve it. If, launching ICBMs is so crucial to US strategy, then it does not make sense for the United States to eliminate them.

If, on the other hand, the critics are correct and the United States can safely eliminate ICBMs, then there is no reason why a president should be so eager to use ICBMs early in a crisis before they can be wiped out. If the United States can afford to eliminate its nuclear weapons now, in peacetime, then a US president can also afford to wait and ride out any attack on the ICBM force in the event of hostilities. If ICBMs are truly expendable, then there is no reason to risk an accidental nuclear war just to avoid losing them.

In sum, one can hold two logically coherent positions. First, one can maintain that US ICBMs are necessary for US nuclear strategy, but they carry some inherent risk of accidental nuclear use. Second, one can hold that ICBMs are unnecessary for US nuclear strategy and there is, therefore, no reason for a US president to launch them early in a crisis. But, the critics' position contains a logical contradiction. They maintain that ICBMs are both unnecessary and so essential that a US president would feel great pressure to use them early in a crisis.

Moreover, the argument that ICBMs increase the risk of nuclear war is not supported by the empirical evidence. The United States, Russia, and China have all possessed silo-based ICBMs for decades without an accidental nuclear launch. Critics such as Perry have argued that there have been scares and close calls, a debatable proposition, but the fact is, ICBMs have never been launched due to a false alarm or accident.[59] Further, those in a position of authority have consistently decided that the benefits of ICBMs outweigh the risks. The United States built and possessed ICBMs for decades and US adversaries are building and modernizing ICBMs today.

ICBMs Are Affordable

Finally, contrary to the arguments of the critics, ICBMs are affordable. The full cost of US nuclear modernization, estimated at over $1 trillion over 30 years, is certainly a large sum. Many figures for US government spending are so large, however, that they are hard to fathom. To put this number into perspective, nuclear modernization costs will make up approximately 5 to 7 percent of the US defense budget. This is also much smaller than historic levels of spending on nuclear forces, which regularly reached 10 to 15 percent of the defense budget during the

Cold War. In the end, cost arguments for nuclear reductions are not persuasive. As David Mosher argued, looking for savings in nuclear forces is a "hunt for small potatoes."[60] And, as former Secretary of Defense Ash Carter put it, "nuclear weapons don't actually cost that much."[61]

Furthermore, it is puzzling that critics cite costs as a reason to cut ICBMs, because they are the least costly leg of the triad. Placing a nuclear weapon in a fixed silo at existing sites is much cheaper than building a new stealth bomber or a new nuclear-powered submarine. The Congressional Budget Office projects that the cost of modernizing the ICBM, bomber, and SLBM comes to $149 billion, $266 billion, and $313 billion, respectively, over the next 30 years.[62] Moreover, the annual operating costs of each leg are estimated at $1.4 billion for ICBMs, $1.8 billion for bombers, and $3.8 billion for SLBMs. If cost savings are a top priority, then the ICBM force should not be the first leg on the chopping block.

Most importantly, beginning with Chuck Hagel, each successive US secretary of defense has maintained that nuclear deterrence is the most important mission of the Department of Defense.[63] Reasonable people can certainly disagree, but 5 to 7 percent of the defense budget for the most important defense mission of US should be interpreted as not only affordable but as a good bargain.

Conclusion: The Future of the ICBM Force

This article made the case for the US ICBM force. Contrary to the claims of critics, this article demonstrated that ICBMs contribute to US nuclear strategy by enhancing deterrence and assurance and helping Washington achieve its objectives should deterrence fail. Rather than scrapping the ICBM force as critics have advocated, therefore, the United States should maintain and modernize this leg of the nuclear triad as planned.

The argument here has implications for both scholars and practitioners. Leading theories of nuclear deterrence identify a secure second-strike capability as the distinguishing feature of the "nuclear revolution" and, therefore, the most important capability for ensuring nuclear deterrence.[64] States that lack such a capability may be vulnerable to a nuclear first strike, but states with an assured retaliatory capability can reliably deter enemy nuclear attack. This theoretical starting point biases scholars to a single-minded focus on survivability as the most important attri-

bute of a nuclear force. As the above analysis demonstrates, however, US nuclear strategy aims to achieve more with its nuclear weapons than simply deterrence of enemy nuclear attack on the US. There are other attributes of a nuclear force beyond survivability that matter for these other interests. Scholars can, therefore, broaden their aperture to consider other attributes of nuclear forces and how they influence world politics, including their ability to contribute to assurance and damage limitation.[65]

For practitioners, the most important implication of this analysis is that US national security requires the United States to maintain and modernize ICBMs. Technology has advanced significantly in the past 50 years, and Washington can use the upcoming modernization cycle as an opportunity to enhance the positive attributes of the ICBM force. ICBMs are currently less accurate than US SLBMs, and their relatively large warheads could result in high levels of collateral damage.[66] This could render them less credible as a deterrent or assurant or less desirable for employment in damage-limitation missions. These deficiencies can be addressed in the modernization process. The new GBSD can harness new technology to improve the missile's accuracy and provide lower-yield options that can be appropriately tailored to the threat environment. These enhancements can contribute to deterrence, assurance, and damage limitation and to US national security more broadly.

In sum, the ICBM force should retain a prominent role in America's nuclear posture. A robust nuclear force spread throughout the US homeland raises the bar for a successful enemy nuclear first strike and makes it less likely a US president will ever need to face an anguished decision about nuclear retaliation. As Secretary of Defense James Mattis put it, speaking in defense of US nuclear forces, "What we're trying to do is set such a stance with our triad that these weapons must never be used."[67] SSQ

Notes

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