Journal of POLICY & STRATEGY

NATIONAL INSTITUTE
FOR PUBLIC POLICY

Journal of Policy & Strategy

Editorial Office

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The National Institute Press would like to express their appreciation to the Sarah Scaife Foundation for the generous support that made the *Journal of Policy & Strategy* possible.

Journal of Policy & Strategy

Vol. 1, No. 1 Fall 2021

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EDITOR's NOTE

Welcome to the Fall 2021 issue of National Institute's new *Journal of Policy & Strategy*—a quarterly, online, and peer-reviewed journal. In this inaugural issue, readers will find features that will appear regularly in future issues. For example, under the initial heading "Analysis," recent Defense Department officials Robert Soofer and Matthew Costlow provide an important examination of the Department of Defense's 2020 *Report on the Nuclear Employment Strategy of the United States*. This DoD report itself correspondingly appears under the heading "Documentation," a section in which the *Journal of Policy & Strategy* will regularly present key official government reports, speeches and Congressional testimony. Also included in this inaugural issue is an extensive and thoughtful commentary by General Larry Welch (USAF, ret.), former Air Force Chief of Staff and Commander of the Strategic Air Command. Interviews of important contributors to national security, conducted by David Trachtenberg, will be another regular feature of the *Journal of Policy & Strategy.* Also included in this issue are the proceedings from three online symposia (webinars) hosted by National Institute in 2021. In these three online symposia multiple speakers address three separate issues respectively: "The Meaning of 'Strategic Stability' and What to Expect from a U.S.-Russian Strategic Stability Dialogue"; "The 'Action-Reaction' Arms Race Narrative vs. Historical Realities"; and, "Prospects for U.S. Nuclear Modernization." The penultimate section in this premier issue is a "Literature Review"—another feature that will appear regularly in this journal. It includes expert reviews of prominent books and published studies focusing on international security. Finally, a feature entitled "From the Archive" will regularly present a classic article, study or testimony from the 1960s-1980s. Selected for inclusion in this feature will be past works that provide analysis or commentary of enduring great value. The "From the Archive" selection in this issue is a prescient 1982 article on arms control by the late Colin S. Gray. The editors would again like to welcome readers to this premier issue of the *Journal of Policy & Strategy.* Our goal is to ensure that this and every future issue is in the public interest and well worth the read.

ANALYSIS

An Introduction to the 2020 Report on the Nuclear Employment Strategy of the United States

By Robert Soofer and Matthew R. Costlow

INTRODUCTION

No other nuclear-armed power provides as much transparency about its nuclear policy, strategy, and force structure as does the United States. Through major unclassified posture and strategy reviews, annual budget requests, testimony to Congress, public speeches, and a myriad of unclassified official publications, the U.S. government reveals to friend and potential foe alike the purposes for which it maintains nuclear weapons, the potential circumstances of their employment, and the broad numbers and types of weapon systems deployed and under development.

To this end, Congress requires that the Secretary of Defense, on behalf of the president, submit a report on the *Nuclear Employment Strategy of the United States* when the president implements a change to that strategy. The 2020 *Report on the Nuclear Employment Strategy of the United States* (also known as the Sec. 491 report, named for the Congressional statute requiring the report) reflects the implementation of new employment guidance by updating DoD military guidance and plans. In explaining to Congress those modifications to employment strategy, it is incumbent upon the Department of Defense to assess the effects of these changes for the important goals of nuclear deterrence, extended deterrence, and assurance of allies, among other goals.

The revised guidance reflects continuity with previous guidance while making prudent adjustments in response to contemporary nuclear threats and great power competition. As with any document that expounds on the employment of nuclear weapons, critics will almost certainly claim the guidance increases the role of nuclear weapons in U.S. national security policy. It does not. Instead, it calls for strengthening of U.S. and allied security through tailored nuclear deterrence strategies supported by flexible capabilities – a long-standing bipartisan approach supported by presidents and Congresses for decades.

The 2020 report, delivered to the Congressional defense committees in December 2020, represents the culmination of many hours of hard work and coordination, not only within OSD Policy, but also the Joint Staff, the State Department, United States Strategic Command, the National Security Council, and many other organizations. We hope its publication will provide further insight on the factors that influence U.S. nuclear strategy and posture.

CONTINUITIES WITH THE 2013 REPORT

Much like how the 2018 *Nuclear Posture Review* (NPR) shared a number of continuities with the 2010 *Nuclear Posture Review*, so too did the 2020 *Nuclear Employment Strategy* retain

many elements from the 2013 *Nuclear Employment Strategy*.[1] For instance, the 2020 *Nuclear Employment Strategy*, like its predecessor, emphasizes the importance of modernizing the triad of U.S. nuclear forces – bombers, submarines, and land-based missiles – in addition to dual-capable aircraft. Both reports also recognize a similar set of roles for modernized nuclear weapons in U.S. defense strategy, namely, deterring potential adversaries, assuring allies and partners, achieving objectives should deterrence fail, and hedging against an uncertain future.

On deterrence specifically, both the 2013 and 2020 reports note that the credibility of U.S. deterrence requires the United States to plan to achieve its objectives should deterrence fail. This requires the United States to prepare for a "range" of scenarios in which U.S. officials may consider nuclear employment, from limited use up to general nuclear war. An important contribution to deterrence is the U.S. ability to adapt its force posture to respond to changes in the threat environment – a point on which both reports agree. To improve the prospects of deterrence working in a range of plausible scenarios against actors with unique capabilities and priorities, both reports highlight the ability to upload additional nuclear warheads onto strategic systems as important, especially since the U.S. industrial base and increased design and production capabilities cannot reasonably be expected to keep pace with dynamic deterrence requirements. The recent public discovery of three apparently new and previously undisclosed Chinese ICBMs fields, with well over 200 silos total, is just one example of how quickly deterrence requirements can change, and the manifest value of the ability to hedge against such challenges.[2] Both reports ultimately agree that nuclear deterrence is best served by a modernized U.S. nuclear arsenal, with a force posture that is able to adapt to anything from shifts in the threat environment, to technical or geopolitical surprise, and the needs of the U.S. president in any sort of crisis.

Should a crisis develop into a conflict however, and nuclear deterrence fails, neither the 2013 or 2020 versions of the reports express confidence that nuclear escalation can or will be controlled, but it would be imprudent not to try. Thus, both reports reject strategies that do not prepare for nuclear deterrence failure, such as "minimum deterrence," and the policies and force postures often associated with it, such as de-alerting missiles, radical nuclear force reductions, and counter-value targeting (i.e., targeting population centers).[3]

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[1] On the continuities between the NPRs, see, John R. Harvey, Franklin C. Miller, Keith B. Payne, and Bradley H. Roberts, "Continuity and Change in U.S. Nuclear Policy," *Real Clear Defense*, February 7, 2018, available at https://www.realcleardefense.com/articles/2018/02/07/continuity_and_change_in_us_nuclear_policy_113025.html.

[2] Joby Warrick, "China is Building More Than 100 New Missile Silos in its Western Desert, Analysts Say," *Washington Post*, June 30, 2021, available at https://www.washingtonpost.com/nationalsecurity/china-nuclear-missile-silos/2021/06/30/0fa8debc-d9c2-11ebbb9e-70fda8c37057_story.html; and, William J. Broad and David E. Sanger, "A 2nd New Nuclear Missile Base for China, and Many Questions About Strategy," *The New York Times*, July 26, 2021, available at https://www.nytimes.com/2021/07/26/us/politics/china-nuclear-weapons.html; and, Rod Lee, "PLA Likely Begins Construction of an Intercontinental Ballistic Missile Silo Site near Hanggin Banner," *China Aerospace Studies Institute (United States Air Force)*, available at https://www.airuniversity.af.edu/CASI/Display/Article/2729781/pla-likely-begins-construction-of-an-intercontinental-ballistic-missile-silo-si/.

[3] For more on what constitutes a "minimum deterrence" strategy, see, Keith B. Payne and James Schlesinger, *Minimum Deterrence: Examining the Evidence* (Fairfax, VA: National Institute for Public Policy, 2013), available at https://nipp.org/wp-content/uploads/2021/05/Final-for-Distro-7.17.pdf.

On this point, both reports note that U.S. nuclear employment plans adhere to the Law of Armed Conflict and do not intentionally target civilian populations. In short, the United States will retain multiple nuclear response options that meet the policy goals put forth by the U.S. president in a conflict.

On assurance and extended deterrence, the 2013 and 2020 reports agree that a modernized U.S. nuclear arsenal, including elements that can be forward deployed, is vital for providing assurance to allies and increasing the chance that potential adversaries will view U.S. defense commitments as credible. The U.S. nuclear arsenal in this regard is the most powerful nonproliferation tool the United States possesses, since if allies and partners view the U.S. commitment to their security as credible, then they can forgo pursuing their own independent nuclear weapon programs. As the nuclear and strategic non-nuclear threats to U.S. allies and partners appear to be expanding, the U.S. ability to extend deterrence will likely remain a key focus of U.S. nuclear employment strategy.

Finally, both reports agree that U.S. nuclear weapons play an important role in hedging against adverse geopolitical or technological developments. For U.S. nuclear weapons to accomplish their hedging mission more effectively, the United States must support and fund a flexible and responsive nuclear infrastructure to modernize the existing U.S. nuclear arsenal instead of relying almost solely on the non-deployed stockpile. Importantly, the U.S. nuclear hedge can play more than the passive role of simply responding to outside events. Rather, the U.S. ability to upload additional warheads onto strategic systems can have a deterrent effect helping to convince potential adversaries that they cannot match or gain superiority over the United States even with a rapid buildup.

AREAS OF DIFFERENCE BETWEEN THE 2013 AND 2020 REPORTS

Many of the differences between the 2013 and 2020 reports are attributable to the major shifts in the security environment between the time the two reports were published, not, as some may suspect, a result of partisan or ideological differences. Whereas in the 2013 report, the "most immediate and extreme danger" was nuclear terrorism (in addition to the other pressing threat of proliferation), in the 2020 report, the fundamental threats are an aggressive and expansionist China plus a revanchist Russia, and specifically in the nuclear realm, the threat of their limited nuclear employment. Since the 2013 report was published, it has become clear that China and Russia are not seeking "strategic stability," at least as defined by the United States. Instead, they have been modernizing their nuclear forces and increasing their arsenal sizes significantly to support their strategies of nuclear coercion, Russia mainly through its non-strategic nuclear weapons and China with its intermediate- and intercontinental-range nuclear weapons. Crucially, the projected increases in the Chinese and Russian nuclear arsenals are not seen as merely temporary, but rather long-lasting and critical to consider as the United States contemplates its future nuclear force structure in the ongoing Biden Nuclear Posture Review.

Given these changes in the security environment since the 2013 report, the 2020 report did not include the previous language on the United States pursuing nuclear reductions of up to one third of deployed nuclear warheads, which would have brought the total to about 1,000 deployed nuclear warheads. This particular scenario, however, depended on reciprocal Russian action, as the 2013 report makes clear: "The U.S. intent is to seek negotiated cuts with Russia so that we can continue to move beyond Cold War nuclear postures. Although the new U.S. nuclear employment strategy would allow reductions below New START Treaty levels, the new employment strategy does not direct any changes to the currently deployed nuclear forces of the United States."[4] Of course, Russia chose not to pursue the U.S. offer and subsequent developments such as its invasion of Ukraine, its buildup of nuclear weapons, its violation of the Intermediate-Range Nuclear Forces (INF) Treaty, and the ongoing Chinese nuclear build-up, caused the United States to reassess the desirability of such a large reduction in deployed nuclear warheads.

The 2020 report does not provide a preferred total number of deployed warheads because the arsenal size is primarily driven by the requirements of deterrence, assurance, achieving objectives should deterrence fail, and hedging, all within a dynamic threat environment. These requirements must be responsive to changes in the threat environment, both short and long term, and logically so too must the U.S. nuclear arsenal retain its flexibility and especially its ability to upload additional warheads. Instead, the 2020 report states, "Given the range of possible adversary nuclear employment scenarios, it would be imprudent for the United States to reduce its nuclear forces unilaterally at this time or in the near future. Unilateral U.S. nuclear reductions would likely degrade the deterrence of attacks on the United States, its allies, and partners; undermine the assurance of allies and partners; and do nothing to halt the continuing modernization and projected substantial increases in Russian and Chinese nuclear arsenals."[5]

Another area of difference between the two reports is in U.S. nuclear declaratory policy. While the 2013 report followed the lead of the 2010 NPR and endorsed a U.S. effort to create the conditions under which the United States could adopt a "sole purpose" policy – where deterring nuclear attack was the sole purpose of the U.S. nuclear arsenal – the Obama Department of Defense determined that the conditions (i.e., an improved threat environment) did not yet exist. The 2020 report, on the other hand, states that "the United States sees no benefit and significant risk" in adopting a sole purpose policy, due mostly to two factors. First, if adversaries believed the sole purpose policy, it could simplify their attack calculus and lead to an increased chance of their aggression up to a level just below nuclear employment to achieve their war aims at the expense of the United States, its allies,

[4] United States Department of Defense, *Report on the Nuclear Employment Strategy of the United States* (Washington, D.C.: Department of Defense, 2013), p. 6, available at https://archive.defense.gov/pubs/ReporttoCongressonUSNuclearEmploymentStrategy_Section491.pdf.

[5] United States Department of Defense, *Report on the Nuclear Employment Strategy of the United States – 2020* (Washington, D.C.: Department of Defense, 2020), p. 9, available at nipp.org/document-number-one.

and its partners. Second, a U.S. sole purpose would "dispirit" allies and partners by "raising doubts" about the U.S. will to defend them.[6]

DETERRING AN ADVERSARY'S REGIONAL LIMITED NUCLEAR ATTACK

After noting the similarities and differences between the Obama and Trump Nuclear Employment Strategies, it is important to note a central theme in the 2020 *Nuclear Employment Strategy*: explaining how the United States plans to deter, and if deterrence fails, respond to an adversary's limited nuclear attack, perhaps arising from their failed conventional aggression in a regional conflict. First, the 2020 report notes that the United States will attempt to minimize civilian damage "to the extent possible consistent with achieving U.S. objectives and restoring deterrence."[7] In other words, U.S. policy is not to strike back reflexively at an opponent in a fit of vengeance without regard for civilian lives after absorbing a limited nuclear strike – U.S. military options must help accomplish defined policy goals.

Second, to increase the chances that a U.S. response to a limited nuclear strike achieves U.S. objectives, including deterring further nuclear escalation, the United States retains a set of graduated and flexible response options – underpinned by a set of nuclear weapon capabilities with a mix of attributes. If the President or senior U.S. leadership believes the set of options they are presented will not meet their desired objectives, the United States also retains the ability to adaptively plan based on new guidance or information. Again, the emphasis in the 2020 *Nuclear Employment Strategy* is on maintaining the capabilities necessary for the United States to adapt in what would likely be a rapidly-changing crisis or conflict, when information is at a premium and adversary intentions are uncertain – a goal endorsed by at least five decades of bipartisan U.S. nuclear policymakers.

Third, it is imperative that the United States maintains a suite of nuclear weapons, each with unique characteristics (speed, yield, survivability, etc.) to support U.S. leadership options, aid deterrence efforts, and if needed, respond effectively in a manner that demonstrates the adversary stands to lose far more than it could hope to gain – a goal in harmony with the 2013 report. Should deterrence fail and an adversary conduct a limited nuclear strike, the United States will have the capability to respond in a way that both demonstrates "resolve and restraint" – a difficult balance to be sure, but one that accounts for the undoubtedly serious stakes of the conflict as well as the desire to restore deterrence at the "lowest level of damage possible and on the best achievable terms for the United States, allies, and partners."[8]

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[6] For a more in-depth study of the purported benefits and potential costs of changes to U.S. nuclear declaratory policy, see, Matthew R. Costlow, *A Net Assessment of "No First Use" and "Sole Purpose" Nuclear Policies* (Fairfax, VA: National Institute for Public Policy, July 2021), available at https://nipp.org/wp-content/uploads/2021/07/OP-7-for-web-final.pdf.

[7] United States Department of Defense, *Report on the Nuclear Employment Strategy of the United States – 2020*, op. cit., p. 7.

[8] United States Department of Defense, *Report on the Nuclear Employment Strategy of the United States – 2020*, op. cit., p. 7.

Fourth, and importantly, while adversaries can be certain there will be a response to their limited nuclear employment, they cannot be certain of the size and scope of that response – an uncertainty of such great magnitude and consequence should contribute to deterrence of the attack in the first place. In essence, an adversary leadership should view the risks of challenging the United States from the lowest end of the nuclear weapons employment threshold all the way up to general nuclear war as insurmountable and not worth any imaginable gain. The U.S. ability to, in the most extreme scenario, absorb a large-scale nuclear attack and still retain "sufficient survivable forces to ensure credible response options" is potentially vital for any attempt to deter further adversary nuclear escalation after a limited nuclear strike.[9]

Some critics may respond that such a U.S. strategy sounds like nuclear "war-fighting" – perhaps pointing to the recent U.S.-Russian reaffirmation of the principle that "a nuclear war cannot be won and must never be fought."[10] Yet, U.S. nuclear employment strategy and the principle that nuclear war cannot be won and must never be fought are actually in alignment – the United States certainly seeks to prevent a nuclear war, and to that end, it retains the ability to respond to a nuclear attack to strengthen deterrence against the possibility. As former Secretary of Defense Mattis observed, "… a safe, secure, and effective nuclear deterrent is there to ensure a war that can never be won, is never fought."[11]

The term nuclear "war-fighting" posture should be retired both because of its use as a scare tactic meant to end debate, but also because it inaccurately purports to describe a characteristic or goal of nuclear strategies that does not exist. In other words, as soon as one advocates for a U.S. nuclear strategy that falls between "suicide" (via an immediate unlimited nuclear response) and "surrender" in response to an adversary's nuclear attack, then the strategy is wrongly characterized as nuclear "war-fighting." One can advocate for more or fewer response options, or more narrowly-scoped options, etc., but should nuclear deterrence fail, and should "surrender" or "suicide" be unacceptable options, then the United States must have policies, plans, and capabilities to restore deterrence and limit damage as effectively and at as little cost as possible. It is a paradox of nuclear deterrence that one must appear prepared to use nuclear weapons to provide the best chance that they are not used.

IMPLICATIONS

The policy and military requirements described in the 2020 *Nuclear Employment Strategy* provide the background and context for several U.S. efforts. For instance, the United States is modernizing its nuclear triad because U.S. officials view it as vital for fulfilling the

[9] United States Department of Defense, *Report on the Nuclear Employment Strategy of the United States – 2020*, op. cit., p. 6.

[10] The White House, "U.S.-Russia Presidential Joint Statement on Strategic Stability," *WhiteHouse.gov*, June 16, 2021, available at https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/16/u-s-russia-presidential-joint-statement-on-strategic-stability/.

[11] James Mattis, "Air Force Association 2017 Air, Space and Cyber Conference," *Defense.gov*, September 20, 2017, available at https://www.defense.gov/Newsroom/Speeches/Speech/Article/1318960/air-force-association-2017-air-space-and-cyber-conference/.

requirements of deterrence, assurance, achieving objectives should deterrence fail, and hedging. Not modernizing, or eliminating, a leg of the nuclear triad will severely damage the ability of the other two legs to fulfill those requirements and would likely increase the severity of the threat against the remaining two legs.

The findings of the 2020 *Nuclear Employment Strategy* are applicable to a host of other areas in U.S. policy as well. For example, U.S. nuclear arms control efforts must be informed by U.S. security requirements, so that if and when the United States crafts an agreement, it will not infringe on the most foundational capabilities and policies that promote deterrence. Likewise, it is important to bear in mind the role that U.S. nuclear forces play in the deterrence of opponents' regional aggression and thus the assurance of allies – a key to allied decisions to pursue their own nuclear capabilities.

Ultimately, U.S. nuclear policy and the capabilities that support it are inextricably linked to the broader U.S. defense strategy as a whole; and thus the 2020 *Nuclear Employment Strategy* should not be read with too narrow a focus because nuclear employment policy writ large is about more than simply employing nuclear weapons. U.S. nuclear employment policy, and the supporting force structure, must convince potential adversaries that there is no plausible "nuclear shortcut" to snatch victory from the jaws of conventional defeat, and neither is there any plausible path for military victory at higher rungs of the escalation ladder toward general nuclear war. In essence, U.S. nuclear employment policy and nuclear forces should convey to the adversary that major conflict – whether conventional, nuclear, or other – with the United States and its allies is always the worst possible option; or, if conflict is ongoing, then ceasing the conflict is the best possible option. Without the U.S. capability and confidence to deter the highest levels of violence of nuclear war, its defense strategy at the conventional level is unlikely to succeed against a nuclear-armed adversary.

Stable deterrence thus demands that the United States be capable, and be seen as capable by others, of employing nuclear weapons in extreme circumstances that threaten the vital interests of the United States and its allies. The 2020 *Nuclear Employment Strategy* is a significant part of that process. We hope that its publication and the subsequent discussion of it will contribute to deterrence by further clarifying the factors that U.S. officials consider when developing nuclear policy.

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INTERVIEWS

This year, National Institute has conducted a series of interviews with key national security experts on a variety of contemporary defense and national security topics. These "Conversations on National Security" have been published as part of National Institute's *Information Series* and are available on our website at https://nipp.org/information-series/.

In this inaugural issue of National Institute's *Journal of Policy & Strategy*, we present a three-part interview with General Larry Welch (USAF, Ret.), conducted by David Trachtenberg, Vice President of the National Institute for Public Policy. Gen. Welch is a Senior Fellow of the Institute for Defense Analyses. He is former the Chief of Staff of the Air Force, Commander of the Strategic Air Command, and President of Institute for Defense Analyses. In Part One, he discusses sustaining an effective nuclear deterrent, emphasizing the importance of confidence in the face of uncertainty. In Part Two, he discusses some imperatives of the current international strategic environment. And in Part Three, he addresses two questions about the demands of modernization and senior leader focus on the needs of the nuclear forces to sustain an effective nuclear deterrent.

This interview is presented here in its entirety and adds insightful context to the contemporary debate on the re-emergence of great power competition and how the United States should respond to the difficult challenges of a highly dynamic international security environment.

PART ONE

In this installment, Gen. Welch discusses sustaining an effective nuclear deterrent, emphasizing the importance of confidence in the face of uncertainty.[1]

Q. ***In response to critics who have argued that our ICBMs are unlikely ever to be used or are too dangerous to maintain, you have noted that our ICBMs are "used" every day to ensure the continued functioning of deterrence. In light of this, what do you think of proposals—made by former Secretary of Defense Bill Perry and others—to eliminate ICBMs because they are needlessly redundant, expensive, and subject to accidental launch?***

What is the value of the U.S. extended deterrent or "nuclear umbrella"? Does it remain a credible deterrent to aggression and a disincentive to nuclear proliferation as some suggest? Or is its value diminishing in light of more aggressive behavior by great power adversaries and concerns over U.S. credibility by allies?

[1] See *Information Series*, No.491 (National Institute Press, June 3, 2021) available at https://nipp.org/information_series/conversations-on-national-security-part-one-general-larry-d-welch-usaf-ret-no-491-june-3-2021/.

A. The questions within the two presented for the interview can be summarized as being about the needed composition and size of U.S. nuclear forces. The core question should be: "What is required for the involved parties to be confident in the adequacy of the U.S. strategic nuclear deterrent?" The sub-questions, differences in views, and differences in positions associated with this core question are secondary.

The Needed Trajectories

There are three sets of involved parties that need this confidence to ensure that we stay on the right trajectories. There is a right trajectory to continue the pattern of no use of nuclear weapons established in 70-plus years of working through frequently dangerous levels of tension between nuclear capable adversaries. There is a right trajectory to continue to limit the motivation for proliferation among nations that are fully capable of producing nuclear weapons and building nuclear forces. There is a right trajectory to ensure that U.S. political leaders have confidence they can deal with a range of crises supported by our nuclear deterrence power. For each of these trajectories, there is an involved party or set of parties that the policies and practices of the United States must influence. If involved parties lose confidence in the U.S. nuclear deterrent, it can expose the United States to such risks that other considerations must be secondary.

Confidence and the Need for Some Intellectual Humility

There can be no credible analytical approach to defining what constitutes confidence since it is in the minds of the involved parties, in the minds of the political leadership in Russia, China, and other nuclear powers, in the minds of the political leadership of the 30-plus nations depending on the nuclear umbrella provided by the United States, in the minds of the changing political leadership of the United State, allies, and other partners. In the face of this, there are those who previously served in positions of authority and responsibility who are willing to assert their certainty that we no longer need to operate and sustain the three legs of the triad to sustain confidence in the effectiveness of the nuclear deterrent. They are, in effect, declaring they can see into the minds of potential adversaries.

Others of us who have been directly and personally responsible for operating and sustaining the nuclear forces find more intellectual humility serves us better in maintaining confidence in the effectiveness of the nuclear deterrent. We freely acknowledge our limited capacity to see into the minds of the changing leadership of involved sets of parties. Lacking that capability, 70-plus years of a successful strategy for nuclear deterrence and decades of building confidence in the U.S. nuclear umbrella support a level of confidence that the triad composed of Sea-Launched Ballistic Missiles (SLBMs), land-based Intercontinental Ballistic Missiles (ICBMs), and the bomber force serves the deterrent needs in the face of inherent uncertainty.

While there are important nuances, the core of the strategy for deterrence is not complicated. It is to ensure that the political leadership of potential adversaries believes that we hold at risk what they value most to ensure they can never believe that the benefit from attacking the United States or allies with nuclear weapons is worth the cost and risk. While this core of the strategy has been constant, the forces to underwrite the strategy have been dynamic, responding to changes in the international environment, changes in technology, and the desires of political leadership to limit the use of nuclear weapons to the constant daily purpose of deterring nuclear attacks.

With careful study and analyses, the United States has moved from more than 10,000 deployed strategic nuclear weapons to 6,000 to 2,200 to 1,550. So, today, the nuclear forces needed to sustain confidence in underwriting the strategy are a fraction of the size of the forces at the height of the Cold War. The triad structure of the nuclear force has been constant since the early 1960's when ICBMs and SLBMs joined the bomber force to form the nuclear triad. Today, the triad force structure objective is the bomber force (to include the cruise missile), one modern delivery platform for sea-based ballistic missiles, one for land-based ballistic missiles, and the nuclear weapons to arm the force. The composition and size of the nuclear force must continue to underwrite the strategy with high confidence. That is the imperative. Further, this force should continue to evolve based on realistic and credible analyses.

Motivation for Radical Change and the Role of the ICBM Leg of the Triad

Given the dynamic nature of the composition and size of the nuclear deterrent force and the world environment in which it must perform its vital mission, it is important that we try to understand what is driving the assertion that we need radical change in nuclear force plans. The issues seem to be primarily focused on the ICBM force. The fundamental argument for radical change is that the cost and risk associated with operating and sustaining the ICBM force outweighs the benefit. So, it is useful to consider the role of the ICBM in the minds of the involved sets of parties.

Both Russia and China value their ICBM forces above other nuclear forces. The Soviet Union deployed the world's first ICBM, the R-7A in 1959 using the vehicle type that put Sputnik in orbit. The United States fielded the Minuteman in 1962. The launch of Sputnik and the deployment of the R-7A led to the "missile gap" as a major political issue in the United States in 1959-60. The gap proved to be illusory but the focus on the importance of the ICBM to national security was established. The Strategic Rocket Force in the Soviet Union and now in Russia was formed as a service separate from their Army and Air Force from the initial deployment of their first ICBM. I once spent a day with General Maksimov, Commander of the Soviet Rocket Forces. There was no question in his mind that the Rocket Forces were first

priority. The available information on Russia's nuclear forces modernization plans provides ample evidence that remains true today.

China's Second Artillery was upgraded to a full separate service in 2015. China's first operational ICBM was deployed in 1971 and the ICBM was the single deployed leg of China's strategic nuclear forces until 2015 when their first nuclear ballistic missile submarine (SSBN) began patrols. North Korea and Iran have also focused primarily on the ballistic missile as their nuclear capability delivery vehicle. If ICBM forces are so important to national security in the minds of the political leadership of our potential nuclear adversaries, it is difficult to understand any perception that they are not important in our forces that must deter those potential adversaries. Russia has elevated their threat to our national interests and those of our allies, China has become increasingly assertive. Both are making large investments in increasing the capability of their nuclear forces. Given these developments, it would be massively inconsistent with the realities in the real world for the United States to consider giving up a leg of the nuclear deterrence triad.

There are additional reasons why the ICBM leg of the triad is so important to the effectiveness of the nuclear deterrent. While each leg of the triad brings important capabilities to the deterrent force, the ICBM has unique characteristics. First it is uniquely stabilizing in that it is in a constant state. There is no need for provocative changes in status in a crisis. It is on U.S. soil. It is tied to the nuclear command and control system with a stable reliable structure. In some respects, it protects the other two legs of the triad. With concentrated focus, a determined, technology rich adversary, might develop a campaign that is effective in attacking the sea leg of the triad and doing so without attribution which would greatly complicate the deterrent calculus. The bomber leg of the triad is concentrated on a small number of locations that can be placed at risk with a handful of nuclear or even conventional weapons. Neither effort is worth the cost and risk for the adversary so long as the ICBM force is constantly ready. There could be no ambiguity about an attack on the ICBM force. It would take a massive attack on the U.S. homeland. Even with a massive attack no adversary could be confident in the effectiveness of the attack on the ICBM force so long as it consists of significant numbers.

History also suggests that ballistic missiles evoke a different level of concern for the leadership of the United States. For years, Soviet Bear bombers violated U.S. airspace over western Alaska with relative impunity beyond attempts to intercept and escort them out of U.S. airspace. Soviet Delta SSBNs patrolled within missile range of east coast cities and military bases. The United States paid careful attention to the Deltas to include adjusting bomber alert status on northeastern bases to deal with the short missile flight time. Neither Soviet bombers nor submarines created a crisis. In contrast, Soviet ballistic missiles in Cuba that could reach U.S. east coast cities brought the United States and the Soviet Union perilously close to nuclear war.

The Cost and Risk of Sustaining the Triad

The point is there is high risk to deterrence with a nuclear deterrent force missing the attributes of the ICBM force. So, the question is: what is the cost and risk associated with sustaining the ICBM force that is more compelling than the risk to deterrence and world confidence in the United States from a radical change in force composition and size? The cost issue seems to be straightforward. The Minuteman III, which the new ICBM, the Ground Based Strategic Deterrent, will replace was designed for a 10-year life. By the time it is replaced it will have served its purpose for 60 years. Given this history, the cost-benefit seems unassailable. The cost of the replacement is sometimes declared to be over $250 billion but that number is not always accompanied by the fact that it is the estimated 50-year life-cycle cost. This is an unusual way to portray the cost of any system.

As to risk, the principal concerns seem to be unauthorized or unwise launch. Both are sometimes lumped together as the consequence of a readiness standard that allows for rapid launch, characterized as "hair trigger" by opponents of continuing to operate and sustain the triad. If the trigger guard has been completely effective for more than 70 years, that should warrant confidence in the "always, never" objective. That is, the alert missiles will always respond when directed by proper authority and will never be launched if not properly authorized. Even so, with an abundance of caution, ICBMs on alert are aimed at open ocean areas until a launch is authorized.

As to unwise launch with a decision by the President made too quickly, there is no evidence that any President would be motivated to launch on inadequate information and there is no need to do so. Even after losing numbers of ICBMs to a massive attack, the remaining nuclear forces can deliver a devastating retaliatory response. "Use them or lose them" as a reason to launch on warning is a myth. Launch on warning is an operational capability, not a plan. The operational plan is to launch whenever the President makes the decision. Giving the President the widest range of options is the most effective approach to reduce the existential threat for the United States and allies. Limiting the President's authority to stop or respond in the most effective way to an imminent threat to the nation is contrary to the constitutional role as Commander in Chief. There can be no more serious imminent threat than that presented by potential adversaries' nuclear capabilities. To attempt to ameliorate the danger presented by potential adversaries by limiting our nuclear forces is illogical and counterproductive.

Conclusion

At the start of this interview, a core question was posed; "What is required for the involved parties to be confident in the adequacy of the U.S. strategic nuclear deterrent?" I would add a question. Where is the greatest risk? Is it radical change to a nuclear triad that has served its design purpose effectively for 70-plus years through a wide range of crisis situations

supporting U.S. national interests, those of our allies, and limiting the motivation for nuclear proliferation? Or is it sustaining the three legs of the triad, each serving safely and effectively for 70-plus years, each bringing unique value to the deterrent? The choice seems clear.

PART TWO

In this installment, Gen. Welch discusses some imperatives of the current international strategic environment.[2]

Q. How do you assess the current international strategic environment compared to the 1980s? Is Russia today as much of a threat to the West as the Soviet Union was then?

A. The complexity of the current international strategic environment is due to far more than the traditional focus on Russia's threat to the West. I once heard Dr. Kissinger declare something like: "The day will come when we look back on the Cold War with fond nostalgia." I don't believe that, and I doubt that Dr. Kissinger believed it, but his point is clear. While much of the world lived under the effective dictatorship of the Soviet government and there were periods of danger of massive human annihilation, it was a world that posed national security threats that we had come to understand. It was a world that was more predictable and changed only incrementally over time. It was a world in which our national security strategy and priorities, shared by our allies, were clear with the top priority being to deter attacks on the United States or our allies by the Soviet Union. There was a single existential threat to the United States and our allies. The focus on that single threat was the priority and we clearly succeeded in dealing with that priority.

Now, the situation is far more complex. Russia and China both pose existential threats. The overriding continuing priority is deterring an attack with nuclear weapons from any nuclear power. Virtually everything else has evolved to some degree. With that evolution there is an unfortunate tendency to treat the threats from Russia and China as similar. This tendency is not useful in understanding the threats or formulating effective strategies to address them.

Similarities in Great Power Competitors

There are important similarities in the challenge presented by each. Perhaps the overriding similarity is the prime focus in both Russia and China. That focus is survival of the political regime. Both are great power competitors who view the United States as the greatest obstacle to achieving their regional and global objectives. The similarities include intense

[2] See *Information Series*, No.491 (National Institute Press, July 14, 2021) available at https://nipp.org/information_series/conversations-on-national-security-part-two-general-larry-d-welch-usaf-ret-no-496-july-14-2021/.

focus on increasing military power, rapid exploitation of technologies to undermine U.S. military advantages, economic coercion, other activity to intimidate and threaten nations within their region, disregard for international law and norms of behavior, and near continuous engagement in attacks at levels below armed conflict – gray zone operations. Gray zone operations are inherently more difficult for nations that operate within the rule of law and adhere to international standards of conduct. While we have little strategic experience in dealing with gray zone attacks, we clearly have advantages that we can exploit. These advantages include information technologies, cyber operations, global economic power, and global status. Further, we have allies. We need to overcome our reluctance to engage in the gray zone. Within the limitations of international law and accepted norms of behavior, we can and should engage in the full range of activities to counter adversary gray zone operations.

Differences in Great Power Competitors

Beyond addressing the similarities in the challenges posed by Russia and China, effective strategies to deal with the broader strategic challenge require that we understand and respond to the differences in political motivations, objectives, geopolitics, and national strengths and weaknesses.

Russia

Russia is a declining power with the leadership striving to retain or buttress a great power role. It is a nation beset by a level of corruption and inefficiency that has been so pervasive for so long the society simply accepts this as the way things are with minimum motivation to change. Without such motivation for change, there is little likelihood of reversing the decline. Lacking diplomatic or economic power beyond European dependence on Russian natural gas and being devoid of allies, their strength is in national military power that presents a credible threat to others in the region. The regime is in the survival mode that, coupled with military power, makes them particularly dangerous. The West's approach to dealing with that danger includes economic sanctions with little or no effect on the interests of Russia's political leadership. It is useful to remind that the demise of the Soviet Union was due largely to economic failure. The world is fortunate that, with General Secretary Gorbachev in power, the result was a peaceful end to the Soviet Union and the Warsaw Pact. It would be foolhardy to rely on a similar response to national collapse with the current leadership in Russia.

That the current leadership is facing renewed internal political opposition could be viewed by the West as a positive development. The decline in the economy with GDP per capita slipping from over $15,000 in 2012 to under $10,000 in 2020 may exacerbate the Russian leadership's political challenge. Both developments are likely to further harden the resolve of the Russian political leadership. Any strategy to deal with the threat from Russia must include the persistent combined economic, political, and military power of the United States

and our European and Asian allies. It must also consider the prime motivation of the political leadership in Russia to sustain the regime. This is particularly important in formulating realistic strategies.

A respected military strategist that I greatly admired emphasized that two critically important factors in formulating a strategy for dealing with adversary objectives are the stakes and the capabilities to protect those stakes. Given that, when uneven stakes are buttressed by matching uneven capabilities, the likelihood of a result to our advantage is slim. That advice simply recognizes reality. That reality applies to the Russian response to their perception that Georgia was turning to the West. Both the disparity in stakes and in capability to protect those stakes made the outcome of Russia's support for the breakaway ethnic Ossetians and Abkhazians impervious to Western intercession. Twelve years after the Russian occupation of the breakaway ethnic entities, the recent attempt to change this new status quo failed again. The West had ample information to understand that Russia's political leadership saw and would continue to see change in the status quo in its relationship with Georgia or Ukraine as a threat to the regime. It should have been foreseeable that the threat of Ukraine joining the European Union would lead to a violent response. These experiences should teach us that Russia's red lines are real and that sustaining the position of the political leadership is the ultimate red line.

Hence, the outcome of a political collapse in a nation with the military power of Russia may be far more dangerous to the world than continuing to patiently manage the current challenges with the clear understanding this is not a short-term challenge. It requires a realistic strategy, renewed attention to the relationship at multiple levels, and attention to the long game. It also requires assured deterrence and unquestioned military strength. The needed military strength must include a balanced multi-domain force of land, air, sea, space, and cyberspace combat capabilities since the United States and our allies are facing this full set of capabilities in Russia's military forces.

China

In contrast to Russia, China is a rising power pushing for regional dominance and increased global power and influence. While the economy in Russia is in continuing decline and the regime is under growing internal pressure, neither applies to China. In the same eight-year period with more than a one third decline in GDP per capita in Russia, China experienced a 62 percent increase. As to the stability of the regime in China, Xi Jinping has added more than a dozen titles to his roles as President and General Secretary of the Communist Party. Each added role provides additional authorities. Further, scrapping presidential term limits in 2018 may be a step towards "president for life" for Mr. Xi. In any case, China's political leadership has the economic resources and internal political stability to pursue their regional and global goals with confidence. At the Chinese Communist Party's (CCP's) 19th national congress, Mr. Xi announced that their global goals include becoming a top

innovative nation by 2035 and a global power by 2050. This set of goals is typical of the long game approach of China's political leadership. Further, it is apparent that that leadership is confident they are on the path to those goals. Some China analysts in the United States believe they will achieve both goals well before those dates. It should be apparent that we are dealing with a set of challenges with China that are fundamentally different from those from Russia and our strategy must be accordingly different.

In formulating a strategy, it is useful to assess relative strengths and weaknesses. The growth of China's economy is impressive. Still, in GDP per capita adjusted for purchasing power, China's economy is only about a fourth of that of the United States. An important advantage of the United States is our allies. This combination, U.S. economic strength, the power of allies, and proven U.S. leadership sustains a wide U.S. economic and political advantage.

Any armed conflict between the United States and the People's Republic of China (PRC) will be vastly different than with Russia. There will be no massed ground maneuver forces facing each other. General MacArthur advised President Kennedy, "Anyone wanting to commit ground troops to Asia should have his head examined." As applied to conflict with China, that remains good advice. At present, China's People's Liberation Army (PLA) ground force strength is almost a million soldiers on active duty. This can be a threat to India and was an important issue in the Korean conflict but has little relevance to the current U.S. challenge from China. Their ground forces are at least as directed at internal security as at foreign threats. Armed conflict with China will be predominantly conflict in the maritime, air, space, and cyberspace domains. China's advantage in the maritime and air domains is proximity. The most worrisome hot spot, Taiwan, is less than 100 miles from the China mainland but 1,700 miles from the U.S. airbase in Guam and 5,000 miles from Honolulu. The U.S. Naval presence in the region is a powerful force but the balance is changing. The point is that regarding Taiwan, the stakes and capabilities to protect those stakes are heavily weighted for China. At the same time, the consequence of a U.S. failure to prevent a PRC invasion of Taiwan could do enormous damage to allied confidence in the United States. This means that an effective strategy to deal with that situation cannot be a U.S. led military defense of Taiwan against a PRC invasion. Instead, there must be other approaches to make the cost not worth the gain. That includes the need to make it clear to the political leadership in Taipei that provoking an attack by the PRC will have a near certain outcome that will not serve Taiwan's interests.

The Technology Imperative

The first announced goal by Mr. Xi at the CCP 19th national congress, to become an innovative leader by 2035, carries a focus on technology. This can strongly impact both economic and military advantages. While U.S. technical superiority remains an advantage, China is moving faster with more focus and our advantage is shrinking. The reason for the shrinking advantage is not because of any inherent advantage in their system. It is because

the U.S. drive for technical superiority, once led by the Department of Defense, has been smothered in process, layers of decision and oversight, and unwillingness to take risks. To illustrate, in the 1970s and 1980s, the U.S. Air Force considered that a useful increment of military capability should be delivered in five to seven years followed by increments of increased capability in follow-on models. The nation delivered on that expectation. The F-15 was delivered in seven years; the F-16 in six. In both cases, the initial capability was followed by incremental improvements that made the systems more and more relevant to the changing environment and operational need. The five-to-seven-year goal was dictated by the technology and operational horizon. Now the technology horizon is much less than five years, and the operational horizon is certainly no longer, yet it takes twice as long to deliver new systems. The same is true of naval aviation and space systems. We will lose our technology advantage unless we address this urgently and effectively. If we lose the technology advantage, it will be followed by losing the military advantage.

The Overriding Existential Threat

There is an additional dimension to the United States-China great power competition that is not relevant to competition with Russia. That dimension is the efficacy of governance and the benefits to the governed. More specifically, which best serves the governed, representative democracy or competent autocracy? President Joe Biden has declared that Xi Jinping is betting democracy can't keep up with autocracy and that proving the Chinese leader wrong is key to the survival of the United States. Chinese scholars point out that the United States did not become a fully representative democracy until somewhere between the 19th Amendment in 1920 and the Voting Rights Act in 1965. In the eyes of China's leadership and perhaps elsewhere in the world, that is not long enough to assume that representative democracy will survive unless carefully nurtured and protected. This is perhaps the overriding existential threat to the United States.

Conclusion

While the United States and allies face a complex set of threats and challenges from gray zone conflict to the threat of nuclear annihilation, understanding the reality and implications of renewed and expanding great power competition is of paramount importance. It is not useful to attempt to prioritize the challenges presented by China over those from Russia or vice versa. These are fundamentally different threats. One with declining economic and international political power whose failure as a nation threatening the political regime could result in their cataclysmic use of military power. The other is a rising power with growing economic and political power and confidence they are on the path to their goals of regional dominance and global influence matching or surpassing that of the United States. These two threats are so different that effective strategies to deal with them will have little in common beyond the need for an effective strategic nuclear deterrent and allies that come together to provide increased levels of regional multi-domain strength.

PART THREE

In this installment, Gen. Welch addresses two questions about the demands of modernization and senior leader focus on the needs of the nuclear forces to sustain an effective nuclear deterrent.

Q. Some argue that we are reaching a tipping point with respect to nuclear deterrence and that if the current nuclear modernization program does not proceed according to current plans that the U.S. nuclear deterrent will be undermined to the point where its effectiveness will be dangerously compromised. Do you share this pessimistic assessment?

A. This question leads to two sub-questions. What is the effect if a planned program is cancelled and what is the effect if not delivered on the planned schedule? The planned modernization program includes four major delivery vehicle programs – Columbia nuclear ballistic missile submarine (SSBN) to replace the Ohio Class, Ground-Based Strategic Deterrent (GBSD) replacing the Minuteman III ICBM, the B-21 bomber replacing the B-2, and the Long-Range Stand-Off (LRSO) missile replacing the air-launched cruise missile (ALCM). At the same time there are four major nuclear weapons programs required to continue to arm delivery vehicles – B61-12 gravity bomb, W87-1 warhead for the GBSD, W80-4 for the LRSO, and W88 Alt 370 to sustain the warhead for the sea-launched ballistic missile (SLBM). Each of the legacy systems, delivery platforms and weapons, have been extended to the maximum assessed end of life.

Consequence of Cancelling a Major Program

The answer to the first sub-question is not complex. There is a single platform for the sea-based leg of the triad and a single platform for the ICBM leg. For the bomber leg, the B-21 is essential to a continued capability to penetrate highly defended areas. The B-52 armed with a stand-off weapon system is and will continue to be the core of the air leg of the triad. Without the LRSO, that capability will wither away. We need not rehash the importance of the triad in answering this question. The need for the triad to sustain confidence in the strategic nuclear deterrent has been revisited repeatedly by a wide range of responsible parties and it remains clear that it is essential to confidence in the effectiveness of the nuclear deterrent. The nuclear bombs and warheads that arm the delivery platforms are also essential to continuation of an effective triad. So, the answer to the effect of cancelling a major planned program is that a leg of the triad would be eliminated, or its effectiveness drastically reduced. With that, confidence in the nuclear deterrent would be undermined to the point where its effectiveness would be dangerously compromised.

The Likelihood of Delay of Major Programs

The second sub-question warrants a more complex answer. It addresses the effect of not fielding delivery platforms or nuclear weapons on the planned schedule. It has been over 30 years since the last new United States strategic nuclear platform (Trident D5) was designed and developed. A single major nuclear weapon program has been delivered during that same period (W76-1) and it was a refurbishment of the W76-0 introduced over 40 years ago. Given the long period of little or no development activity for strategic nuclear systems, the magnitude of this set of programs, and the acquisition performance history for such programs, there is a very low probability of delivering the set of modernization programs on the planned schedule.

Schedule challenges include program management, infrastructure, qualified workforce, budget, and continuing political support. The set of programs incorporates extensive new technologies and processes that are new or that must be re-established. The infrastructure issues include industrial capacity and production of nuclear weapons materials. For example, it has been 32 years since the nation lost the production facility for plutonium pits. The likelihood of executing the plan on schedule to meet plutonium pit production needs for approved programs is near zero. The expected delivery of capability at the repurposed facility at Savannah River has been delayed 3 to 5 years and the projected cost has more than doubled. The workforce challenge extends from industrial skills to high level laboratory experience and skills. Any of these factors can result in significant delays in program delivery. The combination makes delays virtually a certainty.

The Consequence of Delay

The answer to the question of the impact of program delays on the effectiveness of the nuclear deterrent depends on the level of lasting commitment and attention from the nuclear enterprise leadership, the President, the Congress, the Department of Defense, the Department of Energy, industry, and the nuclear forces.

The choices for dealing with program delays are limited. The cost and risk of approaches vary with each program. The choices include extending the life of the legacy system beyond the assessed maximum life that has already been extended, in some cases more than once. This choice is not feasible for some delivery vehicle programs. For any of these programs there is the increasing cost of sustaining the weapon system and the support structure even to the currently stretched maximum life. This is particularly true for the Minuteman III with the missile and its support structure now over 50 years old. Part of the cost is the increasing workload on the missile force as the supply line for parts has become an issue, support equipment is aging, and extensive time-consuming repairs and workarounds are increasingly part of the daily demand.

Whatever the challenge, the men and women in the nuclear deterrence forces will do whatever it takes to deal with the challenges. But as noted in the 2014 Independent Review of the Nuclear Enterprise, the demands on the force have consumed the margins and there is risk with further demands on that force. Both the Air Force and the Navy have experience with the consequences of excessive demand on the men and women in the nuclear forces and will not want to repeat those experiences. Moreover, in the face of adversary developments, there are additional issues with further extending the life of systems that are already at multiples of the design life.

A second choice is to accept lower system availability for some time period, that is, a reduced deployed force. The currently defined needed deployed force is the result of years of continued reassessment of the level that provides for confidence in the deterrent strategy. With geopolitical change, the assessed need for deployed capabilities went from 10,000-plus deployed nuclear weapons to 6,000 in START I to a range of 1,700-2,200 in the Moscow Agreement to the 1,550 in New START.

The assessment of the needed force level is also influenced by developments and relationships with potential adversaries. There is no question about Russia and China's commitment to increased nuclear force capabilities. Iran seems committed to becoming a nuclear power. North Korea is committed to expanding their nuclear forces and the attendant increased influence. It is likely that the leadership of both will continue to see this as in their national interest. Relationships between the United States and Russia and China are significantly more adversarial than when New START was implemented. Russia's continuing expansion of nuclear weapons not covered by New START expands the mismatch in those weapons between Russia and the United States and our European allies. These developments and relationships would pose increased risk even if all U.S. planned nuclear force programs were delivered on time and on performance. Certainly, those developments and relationships are more challenging today than when New START was negotiated.

Bottom Line

Whatever the choices made, increased risk to the effectiveness of the nuclear deterrent with delayed delivery of the planned programs is a fact of life. The level of that risk will depend on the level of attention of the national security leadership in providing the needed priority to sustain the planned nuclear forces programs and minimize and manage delays. If the level of attention is similar to the level that allowed other priorities to consume all the schedule margin for nuclear force recapitalization and modernization, the effect could be major. So, the answer will depend on whether the national security leadership matches action to the now frequent declarations that nuclear deterrence and the forces that underwrite deterrence are the highest national security priority. If delays are extensive, there is the risk that the answer to the question would be yes, the effectiveness of the nuclear deterrent will be dangerously compromised.

Q. The independent review of the nuclear enterprise you co-chaired in 2014 highlighted a "decline in focus" on the nuclear mission that "has been more pronounced than realized and too extreme to be acceptable." Since then, the Department of Defense has assured the public that nuclear deterrence is the number one mission of the Department of Defense. Has the situation improved satisfactorily since then? Are there actions that should be taken that were not?

A. The history of senior national security leadership focus since the end of the Cold War is not a source of confidence in lasting attention to the nuclear enterprise. Between 1993 and 2014, I chaired or co-chaired 18 assessments of facets of the nuclear weapons enterprise requested by the senior leadership of the Department of Defense or the Department of Energy. The assessments addressed a broad range of issues ranging from narrow operational issues to issues broadly impacting the nuclear deterrent forces or the nuclear weapons complex in the Department of Energy. In most cases, the assessments identified serious deficiencies in practices and in support for the nuclear forces. The enterprise leadership usually took near-term actions to address the deficiencies. When the issues were narrow and had clear immediate operational impact, corrective action was usually effective and lasting. But, until the 2014 Independent Review of the Nuclear Enterprise directed by the Secretary of Defense, attention to broader institutional issues with longer term effects waned quickly, sometimes after only months, sometimes after a year of two. Follow-on assessments were characterized by repetition of issues identified in past reports that resurfaced. While the nuclear forces were told by their commanders that strategic nuclear deterrence was job one, actions to support the forces and force capabilities did not match the words. Strategic nuclear programs, delivery platforms and weapons, and the infrastructure to support them were delayed to accommodate other priorities as needs multiplied across the Defense forces.

Some Cause for Optimism

There is reason for optimism beginning with the Secretary of Defense's response to the conditions that led to the 2014 assessment and to the response to two reports describing the situation, one internal to the Air Force and an independent assessment. The independent assessment co-chair was retired Admiral John Harvey. The assessment was presented to the Secretary of Defense with the reminder that, at the first meeting with the co-chairs, he declared that he would personally own responsibility for response to the assessment. The Secretary responded to the assessment by establishing clear responsibility and an institutional structure to address the issues. The core message from the assessment was not complicated. A common commitment of the men and women in the nuclear forces was expressed as, "We'll get it done, no matter what." And they did. The key paragraph at the beginning of the report on the assessment started with: "The bottom line is that the forces are meeting the demands of the mission with dedication and determination but with such increasing difficulty that any margin of capability to meet the demands has been consumed

and the Sailors, Airmen, and Marines are paying an unsustainable price." The message was that without lasting action, the nuclear forces were headed for a cliff.

In response to clear Secretary of Defense direction, the issues in the independent report were undertaken and results tracked and there has been more attention to matching actions with words. Before 2014, it had become difficult to find any declarations from senior leaders, from the President to Service Chiefs, about the priority for the nuclear deterrence mission and forces. After 2014 and continuing to the present, there are clear continuing declarations from the most senior levels of the Department of Defense, including the Service Chiefs, regarding the priority. While that does not guarantee needed action, words matter. The 2018 *Nuclear Posture Review*, with extensive engagement by the Secretary of Defense and approval of the President, was specific and prescriptive about the needs of an effective deterrent, which specifically includes the planned recapitalization and modernization programs. Congressional support has been consistent, adding more emphasis to the priority of the nuclear deterrence forces.

Conflict, Consequence, and Need

Still, while there is reason for optimism, there is also reason for skepticism. Since the 2014 report, schedule challenges and the consequences of delays in delivering needed nuclear forces capabilities were created by the same levels of leadership electing to delay programs to the limit of maximum life to pay for other needs. The competition for resources is likely to increase within the national security community and as other national needs compete with national security. So, it will take increased resolve, increased focus, and steadfast commitment to keep the programs on track and to minimize delays in delivering the needed capabilities.

The lesson is that when the Department leadership directs lasting focus on difficult problems, the Department works its way through solutions. So, the answer to the question about the impact of program delivery issues on the effectiveness of the deterrent depends on the willingness of the key leadership in the White House, the Congress, the Departments of Defense and Energy, industry, and the nuclear forces to provide increased focus and resolve. With increased focus the risk could be manageable. Without such focus we could be undermining the nuclear deterrent to the point that it is dangerously compromised.

PROCEEDINGS

The Meaning of 'Strategic Stability' and What to Expect from a U.S.-Russia Strategic Stability Dialogue

The remarks below were delivered at a symposium on "The Meaning of 'Strategic Stability' and What to Expect from a U.S.-Russia Strategic Stability Dialogue" hosted by National Institute for Public Policy on July 27, 2021. The symposium focused on how the notion of strategic stability has been applied from the Cold War to the present and expectations for the future in light of renewed strategic stability talks with Russia.

Keith B. Payne
Keith B. Payne is a co-founder of the National Institute for Public Policy, professor emeritus of the Graduate School of Defense and Strategic Studies at Missouri State University and a former deputy assistant secretary of defense.[1]

The United States and Russia will soon begin a much-heralded strategic stability dialogue "to lay the groundwork for future arms control." To risk understatement, there has been a paucity of Western thinking, civilian or military, devoted to the subject of deterrence stability for decades. That lack of attention has finally come to an end, but Cold War thought and jargon continue to dominate much apparent official thinking and most public commentary.

What is the legacy Cold War meaning of strategic stability? Very briefly, during the early years of the Cold War, American civilians developed a particular nuclear deterrence paradigm that was the basis for declared deterrence policies known popularly as a "stable balance of terror." This paradigm assumed that for rational U.S. and Soviet leaders, mutual societal vulnerability to nuclear retaliation would ensure an overpowering disincentive to either's nuclear provocation. Mutual vulnerability was expected to enforce stable deterrence.

The "mirror-imaging" presumption underlying this reasoning was obvious: U.S. and Soviet leaders, even with their obvious differences, were expected to calculate and act according to a common set of reasonable goals, norms and values, i.e., those prominent in the United States.

[1] These remarks are drawn from Keith B. Payne and Michaela Dodge, *The Strategic Stability Dialogue: Think Before You Speak, Information Series*, No. 495 (Fairfax, VA: National Institute Press), July 8, 2021, available at https://nipp.org/wp-content/uploads/2021/07/IS-495-final.pdf.

The functioning of deterrence was considered predictable precisely because U.S. and Soviet perceptions and decision making were assumed to be similar and well understood—and thus predictable. Deterrence was thought to be understood in such detail that different types of strategic forces could be categorized as predictably stabilizing or destabilizing. Nuclear policies or programs that contributed to mutual societal vulnerability were said to be stabilizing, while those U.S. forces that might impede the Soviet nuclear retaliatory threat to U.S. society were judged unnecessary for deterrence and likely destabilizing. Armed with this supposedly precise knowledge of how deterrence would function, destabilizing forces could be eliminated or subjected to limits via arms control.

Codifying deterrence stability in this way became the priority purpose of U.S. strategic arms control efforts. This approach to arms control follows from the underlying Cold War stability paradigm and its presumption that the conditions that constitute stable deterrence are understood and strategic forces can be categorized as stabilizing or destabilizing.

An inconvenient truth, however, is that this stable deterrence paradigm was highly questionable during the Cold War; it is even more so now because the contemporary international threat environment is far more diverse and unpredictable.

Contemporary adversaries may well not share the U.S. definition of reasonable behavior, value system or decision-making process. They may not share U.S. perceptions of nuclear risk or consider U.S. balance of terror-style threats sufficiently credible to be deterred by them. Indeed, their goals and decision making may drive behavior that recklessly threatens U.S. and allied security in ways deemed "unthinkable" per the Cold War stability paradigm.

For example, the Cold War stability paradigm assumed similarly reasonable decision-makers with essentially defensive deterrence goals, but at least some contemporary opponents appear to see nuclear weapons as tools of coercion. The United States must now contend with adversaries who are willing to employ coercive nuclear first-use threats to achieve their revisionist geopolitical goals. For example, China's apparent nuclear first-use threats to Japan should Tokyo join with the United States in response to a PRC invasion of Taiwan reportedly included the suggestion that China would seize the Japanese-controlled Senkaku islands in the process. This is an unprecedented coercive use of nuclear weapons for offensive purposes.

These relatively new post-Cold War conditions require a new understanding of deterrence stability—one that takes into account the great variability and diversity in adversaries' beliefs, perceptions, and goals. Indeed, the presumptions underlying the Cold War stability paradigm are now so divorced from the realities of the international environment that it can no longer be considered a prudent guide for U.S. deterrence or arms control considerations.

The forces now necessary for deterrence may vary greatly depending on the opponent and context. In particular, technical characteristics alone cannot be the basis for declaring a

capability to be stabilizing or destabilizing—understanding opponents' goals and perceptions also is key, particularly the purposes they envisage for their nuclear arsenals. Are those purposes essentially defensive, i.e., for the preservation of an existing order and boundaries? Or, are they essentially offensive, i.e., for the destruction of an existing order and boundaries?

The same types of nuclear weapons may be put into service for offensive or defensive purposes, and correspondingly, the same types of weapons may be highly destabilizing or stabilizing depending on the intended purpose. This reality upends the apolitical stabilizing vs destabilizing categorization of forces derived from the Cold War stability paradigm.

It must now be asked: How do Moscow's leaders, and the leaderships of other nuclear-armed states, perceive the risks associated with limited nuclear first-use threats or employment? And, what nuclear risks are these leaders willing to accept in pursuit of their expansionist goals, including Moscow's goal of re-establishing the hegemony in much of Eurasia that Russian leaders believe the West unfairly wrested from Moscow. And, more to the point, how credible against Russian and other limited nuclear first-use threats (that may avoid U.S. territory entirely) is the old U.S. balance of terror-oriented deterrence threat when the consequence for the United States of executing such a strategy could be its own destruction?

The same questions must be asked of China's leadership and its thinking about nuclear weapons use and risk—especially with regard to Taiwan.

These opponents' contemporary use of coercive nuclear first-use threats to advance revisionist geopolitical goals certainly reflects behavior that the Cold War deterrence paradigm simply dismisses as impossible for any rational leadership. Again, the contemporary reality of those goals and threats demolishes the apolitical Cold War categorization of systems as "stabilizing" or "destabilizing," and correspondingly, the basic Cold War notion that arms control should be about focusing on those systems that the Cold War paradigm defines as "destabilizing."

A spectrum of U.S. deterrence threat options seems only prudent in the post-Cold War threat environment given the diversity of opponents, their expressed nuclear threats, and the potential variability of their decision making. The need for credible deterrent options other than, and more flexible than the massive society-destroying threats envisioned in the Cold War's stable balance of terror deterrence paradigm is now obvious, but not new. Secretary of Defense Harold Brown discussed this need in 1979. This deterrence requirement for flexibility, is magnified greatly by the uncertainties of the post-Cold War environment, opponents coercive nuclear first-use threats, and the multiplication of opponents and threats. Correspondingly, U.S. deterrence policies and capabilities must now be resilient and flexible to support credible deterrence policies across a diverse range of strategic threats to us and our allies. Yet, such U.S. capabilities continue to be criticized as "destabilizing" or unnecessary according to the antiquated Cold War paradigm.

In conclusion, what are the take-aways from this discussion? In light of contemporary geopolitical realities, the aged strategic stability paradigm must not be basis for discussing deterrence or arms control. The United States must avoid an approach to arms control that is predicated on its rigid and narrow definition of what is adequate for deterrence and what constitutes stabilizing and destabilizing policies and capabilities. Instead, we must re-establish the meaning of strategic stability consistent with post-Cold War threat realities and identify an approach to arms control that contributes to the resilient, flexible U.S. force posture that may be necessary to preserve peace and order. Understanding the inadequacies of the archaic Cold War stability paradigm and the danger of conducting arms control as a function of that paradigm is now critical given the dramatic changes since the end of the Cold War.

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Michaela Dodge
Michaela Dodge is a Research Scholar at the National Institute for Public Policy and received her Ph.D. from George Mason University in 2019.

First, let me talk about the implications of the Cold War stability paradigm for measuring strategic stability during the Cold War. Then I will talk about how that shaped the U.S. arms control process. Lastly, I will mention lessons learned for future arms control.

Measuring Strategic Stability During the Cold War and Arms Control

As Keith mentioned, the concept of strategic stability defined as assured destruction capability reigned during the Cold War. It can be traced as an offshoot of Secretary Robert McNamara's "assured destruction" concept. The United States developed various sets of metrics of differing value for assessing such defined strategic stability with our archrival the Soviet Union. These metrics were largely quantitative and focused on measurable attributes of nuclear weapon systems.

They were attractive to a wider defense community because they were easily understood by members of Congress. The heavy reliance on quantitative approaches translated into an attractive scientific appearance and impression of certainty, despite the fact that they could not reflect an incredible complexity of an interaction between two adversarial forces.

Quantitative metrics have become so ingrained in U.S. strategic thinking that few appear to have paused to ask whether these metrics measure the right attributes and whether they are applicable to our adversaries. In the words of our esteemed colleagues Fritz Ermarth: "The more simplistic analysis is more convenient. The analyst can conduct it many times, and talk over his results with other analysts who do the same thing. The whole methodology thereby acquires a reality and persuasiveness of its own."

Legacies We Carry Today

The arms control process beholden to the strategic stability paradigm demanded and incentivized "countable" nuclear force categories like a number of launchers or delivery systems. It tended to discount others due to difficulties in counting and verifying them (for example payload and actual warhead numbers). It imposed artificial distinctions between "strategic" and "tactical" nuclear weapons. Not because such a distinction makes sense, it doesn't, but because "tactical" nuclear weapons' numbers and key characteristics are particularly difficult to verify given the absence of highly intrusive verification measures.

Due to the importance attributed to arms control in U.S. Cold War national security strategy, measuring forces in a quantifiable manner suitable for arms control took on a life of its own with academics and policy analysts. Parity meant that the United States and the Soviet Union had a roughly similar number of whatever it was that we were counting without that much thought to qualitative differences among forces, differences in U.S. and Soviet international obligations, or perhaps most importantly—purposes to which countries built their forces. One cannot divorce forces from their political purpose, as Colin Gray pointed out over and over again.

Lessons for Future Arms Control

Regardless of whether quantitative approaches had merit in the past, it is preferable to leave it in the Cold War where they belong. In today's environment, where overall nuclear forces levels are lower, infrastructure decrepit, nuclear-armed opponents and threats more numerous, U.S. deterrence goals more diverse, the omission of relevant factors would be more consequential. Given what we know today, what principles should guide future arms control efforts?

Posture for success. We should not modernize our forces just so we can get an arms control agreement. But it is obvious that we will have naught to discuss if we don't have something the other party wishes to negotiate about. Sergei Ivanov, then-Chief of Staff to Russian President Vladimir Putin, said in 2013, "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]."

Value strategic defense in its own right. Even if one thought it was worth it to limit defense because it was "destabilizing" under the Cold War paradigm, an opinion I do not share, it would not be appropriate to restrict them today. The United States and allies face a multitude of actors armed with ever more sophisticated and capable missiles. Missile defenses provide a measure of protection from consequences of a deterrence failure—and a decision whether deterrence fails is not in our hands. Additionally, defenses can help to

remove an adversary's coercive leverage in the homeland and regional context. This makes them highly stabilizing rather than destabilizing and ought to exempt missile defense from being subjected to limits in an arms control process.

Limit the duration. During the Cold War, the main features of the U.S-Soviet balance of terror evolved slowly. The purpose of strategic arms control was to codify it. Arms control agreements were to "lock-in irreversible limits." The underlying presumption was that the then-current conditions would remain in place and that the U.S. understanding of deterrence would continue to apply. But arms control agreements can make sense only so long as the conditions that recommended them continue to hold—and those conditions may change rapidly. Just think about a difference between 1985 and 1990. Or 2000 and 2005. Because it is difficult for the United States to invoke supreme political interest clauses, arms control treaties should be of limited duration and/or contain easily-implemented provisions that allow adaption to shifting threat conditions as necessary.

Consider the nuclear production complex. During the Cold War, we didn't have to worry as much about other countries' production complexes. That is because our own production complex was very capable—and that allowed us to focus on all those countable categories. We were reasonably sure that we could respond in a timely manner to any developments in an adversary's warhead capabilities. Very unlikely we can do so today. The asymmetry could negatively impact what kind of deals other states are willing to strike with us. Herman Kahn said, "We must look much more dangerous as an opponent than as a collaborator, even an uneasy collaborator…" Our security would be well served by heeding his advice.

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David J. Trachtenberg
David J. Trachtenberg is Vice President of the National Institute for Public Policy and served as Deputy Under Secretary of Defense for Policy from 2017-2019.[2]

As both Keith and Michaela have pointed out, it is time to reconsider our definition of "stability" and its applicability in the post-Cold War era. I would also argue that it is time to break free of the notion, embraced firmly by arms control devotees, that arms control is a necessary tool for achieving greater stability, especially between the United States and Russia. Unfortunately, the history of arms control tends to refute this common, though mistaken, perception.

For the past half century, the United States has looked to arms control as a means of managing the strategic arms competition and forestalling an "arms race." Arms control

[2] These remarks are adapted from David J. Trachtenberg, *Overselling and Underperforming: The Exaggerated History of Arms Control Achievements, Information Series*, No. 497 (Fairfax, VA: National Institute Press), July 22, 2021, available at https://nipp.org/wp-content/uploads/2021/07/IS-497.pdf.

treaties were thought to be useful in maintaining strategic "stability" and avoiding unnecessary expenditures, reducing the role of nuclear weapons in U.S. national security strategy, and demonstrating the declining utility of nuclear weapons in international relations.

As the Biden Administration engages in a new strategic stability dialogue with Russia with an eye on negotiating a future arms control agreement, it is important to learn the lessons of history—and what history teaches is that the promises made by treaty supporters about arms control enhancing strategic stability through greater transparency and predictability often exceeded the results achieved. Indeed, in some cases, U.S. restraint resulting from arms control agreements actually encouraged the Soviet Union and later Russia to take destabilizing actions that increased the threat to U.S. security.

For example, the SALT I Interim Agreement and the ABM Treaty were both thought to enhance strategic stability by capping the growth in offensive nuclear arsenals and codifying mutual vulnerability to nuclear annihilation. In fact, the ABM Treaty was sold as an agreement that would nullify the need for further increases in Soviet nuclear weapons. But while U.S. strategic defenses were reduced and subsequently eliminated, the Soviets engaged in a massive strategic nuclear buildup that demonstrated the fallacy of U.S. thinking and the vastly divergent strategies of the two sides.

Arguably, our agreement to remain vulnerable contributed to the Soviets' incentive to develop large counterforce capabilities to threaten the American homeland—a significantly destabilizing development. This was hardly representative of the often-expressed belief in an "action-reaction arms race" dynamic or its "inaction-inaction" corollary.[3]

Likewise, other treaties fell short of the ambitious achievements their proponents trumpeted. For example, SALT II was fatally flawed and never entered into force. START I was said to result in force levels that were roughly the same as when the talks began nearly a decade earlier. And the supposedly "equal" nuclear warhead limits in New START were set at a level that allowed Russia to build up to the limit while forcing the United States to reduce.

Although New START was hailed by its supporters as restoring transparency and predictability to the U.S.-Russia relationship, its verification procedures were less robust than those in the original START I treaty, undermining its verifiability.[4] Consequently, its

[3] For a detailed analysis of this commonly expressed narrative, see David J. Trachtenberg, Michaela Dodge, and Keith B. Payne, *The "Action-Reaction" Arms Race Narrative vs. Historical Realities* (Fairfax, VA: National Institute Press, March 2021), available at https://nipp.org/wp-content/uploads/2021/04/Action-Reaction-pub.pdf. Also see David J. Trachtenberg, Michaela Dodge, and Keith B. Payne, *The "Action-Reaction" Arms Race Narrative vs. Historical Realities*, *Occasional Paper,* Vol. 1, No. 6 (Fairfax, VA: National Institute Press, June 2021), available at https://nipp.org/wp-content/uploads/2021/06/OP-6-final.pdf.

[4] Bryan Smith, *Verification After the New START Treaty: Back to the Future, Information Series*, No. 463 (Fairfax, VA: National Institute Press, July 16, 2020), available at https://nipp.org/wp-content/uploads/2021/03/IS-463.pdf.

value as a tool for improving the bilateral relationship is not only problematic, but its purported benefits—as sold by supporters to the Congress and the American people—far exceeded its accomplishments, as evidenced by the precipitous decline in the U.S.-Russia relationship since 2010 and the expansion of Russia's coercive threats and outright military aggressiveness.

Moreover, the shortfalls of arms control in ensuring stability are exposed by a history of Russian arms control non-compliance. This behavior can hardly be called stabilizing. Indeed, Russian cheating on the INF Treaty and the Open Skies Treaty led the Trump Administration to withdraw from both.

Although arms control proponents have hailed various treaties as fostering greater stability in the U.S.-Russia relationship, in reality the United States today faces a much more assertive Russia than before—again, hardly an exemplar of stability and predictability. Indeed, various commentators have suggested that the strategic situation today is one of greater risk and uncertainty, and that the potential for nuclear conflict is greater than ever. Hence, the main objectives of arms control espoused by its proponents appear to be ephemeral at best, if not completely illusory.

With Russia violating its arms control commitments; building new nuclear weapons systems that circumvent existing arms control treaties; making brazen nuclear threats against other countries, including non-nuclear states; conducting massive exercises of its strategic nuclear forces that rival its actions during the Cold War; and placing increasing emphasis on nuclear weapons in its own strategy and doctrine—how can arms control be seen as having succeeded in fostering stability?

Now there are those who believe that the answer to the failure of arms control is more arms control. I'm reminded of the famous quote, attributed to Albert Einstein, that "The definition of insanity is doing the same thing over and over and expecting different results." Much like an addictive narcotic, arms control appears to dull sound judgment and make you want more.

As newly-confirmed Under Secretary of State for Arms Control and International Security Bonnie Jenkins tweeted this week, "I am committed to reduce the risk of nuclear war by effective arms control, [and] limit Russian and PRC nuclear expansion…."[5] Yet another quote worth citing is from the recently released Joint Nuclear Operations document, which states: "Despite concerted US efforts to reduce the role of nuclear weapons in international affairs and to negotiate reductions in the number of nuclear weapons, since 2010 no potential adversary has reduced either the role of nuclear weapons in its national security strategy or

[5] Bonnie Jenkins tweet, July 25, 221, available at https://twitter.com/UnderSecT/status/1419392587924914178.

the number of nuclear weapons it fields. Rather, they have moved decidedly in the opposite direction."[6]

While arms control may, in theory, be useful in establishing lines of communication between potential adversaries and cultivating dialogue, the belief that arms control agreements will improve strategic stability between the parties reflects the triumph of hope over experience.

Yes, arms control does work best when it's needed least. And the only way arms control can contribute to stability is if the parties share similar goals and objectives. However, Russia and the United States do not share the same goals and objectives, and, in fact, often work at cross purposes. The United States seeks a stable and peaceful world order. Russia—and to an increasing degree, China—seeks to overturn a world order that it believes has been unfairly dominated by the United States and the West.

With such conflicting worldviews, the idea that arms control can contribute to stability seems to be a chimera. Indeed, even some arms control enthusiasts have acknowledged there is no common understanding of "what constitutes strategic stability,"[7] and as Keith and Michaela have pointed out, "the United States must re-establish the meaning of strategic stability consistent with the new realities of the post-Cold War threat environment…."

Above all, we should be realistic in our expectations about what a strategic stability dialogue is likely to achieve. Overselling arms control as a means to bring about stability perpetuates a myth and does a disservice to the cause that arms control proponents purport to advocate—that of promoting a more stable and secure world.

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Franklin C. Miller
Franklin C. Miller is a Principal of The Scowcroft Group and served for three decades as a senior policy official in the Pentagon and on the National Security Council Staff.[8]

On June 16 Presidents Biden and Putin announced in a Joint Statement that the United States and Russia would "… embark together on an integrated bilateral Strategic Stability Dialogue in the near future…."

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[6] Department of Defense, *Joint Publication 3-72, Joint Nuclear Operations*, 17 April 2020, p. I-1, available at https://fas.org/irp/doddir/dod/jp3_72_2020.pdf.

[7] Michael Krepon, "Let's Discuss Strategic Stability," *Arms Control Wonk*, July 6, 2021, available at https://www.armscontrolwonk.com/archive/1212358/lets-discuss-strategic-stability/.

[8] These remarks were drawn from Frank Miller, "Talking About Strategic Stability" published in *RealClear Defense*, July 8, 2021, available at https://www.realcleardefense.com/articles/2021/07/08/talking_about_strategic_stability_784613.html.

This brought rejoicing in several quarters, particularly among arms-control proponents here at home and in NATO Europe. But a clear-eyed assessment requires us to acknowledge that concern rather than enthusiasm is called for. Holding a dialogue on "strategic stability" is superficially appealing until we realize that, while the term is thrown about in academic and even some government circles, there is no agreed definition (even within the US government and certainly not between the American and Russian governments) of what "strategic stability" means—let alone how such a discussion can, as the Biden-Putin statement proposes "lay groundwork for future [arms control] agreements."

Even Western arms control theorists debate what "strategic stability" means. To some, it's about "first strike stability"—a situation where neither side has either an incentive or a force structure designed to carry out a disarming first strike against the other. That's a nice theoretical idea in the West, but it never took hold in Moscow. Historically Soviet and today Russian ICBM forces are designed around a first strike, there being no other reason to maintain the heavily MIRVed SS-18 ICBM for decades only to begin replacing it recently with the larger "Sarmat" missile. To other Western academics, "strategic stability" represents the flip side of "first strike stability": a situation in which neither side threatens the other's second-strike retaliatory capabilities; both Washington and Moscow seemingly adhere to this concept, but only Russia continues to pursue first strike disarming capabilities notionally aimed at reducing U.S. second strike potential—raising serious questions about the degree to which Moscow truly subscribes to it. Alternatively, strategic stability might mean "arms race stability," in which neither side begins fielding new weapons systems as long as its potential opponent does not. But again, Russia began modernizing all of its nuclear forces – both long-range and shorter-range systems—over a decade ago while at the same time the United States was content to allow its existing forces to age until well into the late 2020s.

Strategic stability has also been applied to avoiding accidents between the air or naval forces of the United States and Russia in order to prevent inadvertent loss of life and escalation. But such agreements—the 1972 Incidents at Sea Agreement and the 1989 Prevention of Dangerous Military Activities Agreement—already exist and remain in force; the problem is that the Russian military—under explicit direction (or at least tacit approval) from the Putin Administration—routinely ignores them by harassing U.S. and allied units in a dangerous and unprofessional manner. (The recent treatment of the British destroyer HMS Defender in the Black Sea is the latest case in point.)

Strategic stability could also be applied to avoiding fears of surprise attack by conventional forces, thereby reducing international tensions. This, too, however has already been addressed: the 2011 Vienna Document calls for the parties to provide notice and transparency regarding exercises; Russia routinely ignores the Vienna Document by lying about the size of its exercises and by convening massive "snap drills" which foster fears among observers that they are actually preparations for an invasion or attack.

In a perfect world, strategic stability talks might also address cyber attacks on critical infrastructure and key capabilities such as nuclear command and control systems; that said, cyber capabilities and operations are so highly classified that there is no reasonable prospect of a meaningful outcome in a U.S.-Russian discussion about them. President Biden's warning to Vladimir Putin in Geneva is as much as can be done in the diplomatic sphere, with deterrent operations necessary if Russian attacks continue.

Given all of the above, what then might we expect from a dialogue on "strategic stability"?

With respect to avoiding dangerous interactions between U.S. and Russian forces and avoiding threatening exercises, no dialogue should be necessary. Russia needs to be reminded of its existing obligations and we should avoid any suggestion that we would make new concessions to get them to observe them. Russian negotiating tactics since the mid-1940s have often demonstrated, in the words of Averill Harriman, "getting us to pay for the same horse twice." That should not happen again.

Halting or curtailing the needed modernization of U.S. nuclear forces (as some would have us do in the name of "restoring arms race stability) similarly should be off the table: we have reached a point where our forces must be replaced or retired; there is no middle ground. And according to Putin's Defense Minister, Russia's nuclear modernization program already is over 80 percent completed.

Realistically speaking, therefore, the only area which might usefully be discussed in a future "arms control (not "strategic stability") dialogue" is updating New START. If addressed correctly, there is potential promise here, but it requires breaking from the arms control establishment's traditional approach. Existing arms control canon calls for a new round of reductions in U.S. and Russian strategic nuclear forces. But this approach is not only threadbare but flawed on multiple counts. First and foremost, it ignores the bloated Russian arsenal of shorter-range forces. Russia has a fully modernized force of several thousand ground-, air- and sea-launched nuclear weapons designed for use on the battlefield and in the theater. All of these are dubbed "non-strategic," but the old saw that a weapon is "strategic" if one is in the impact area applies. Russian tactical and theater weapons—not their intercontinental ones—are likely the first to be used in any war, and it is therefore essential to capture those in any new agreement. Second the United States has little to trade off against these Russian systems, having eliminated 95 percent of U.S. counterpart weapons in the 1990's pursuant to the George H.W. Bush-Gorbachev and Bush-Yeltsin Presidential Nuclear Initiatives (which Russia failed to implement with regard to its short- and medium-range nuclear forces). As a result, Russian interest in a separate agreement on "non-strategic" nuclear forces is non-existent.

The only sensible way—from both a deterrence standpoint and a negotiating one—is to seek a new agreement which would replace New START and capture all deployed U.S. and Russian nuclear weapons ("deployed" defined as all weapons not in the dismantlement queue). This

would exploit the fact that Russia is in fact interested in keeping New START in one form or another. (The Trump Administration embraced this approach in mid-2020, but by the time it was deployed it was both too late given Russian considerations of U.S. domestic politics and complicated by the Administration's goal of including China.) As an opening move, the United States might propose that each side be limited to 3,500 nuclear weapons of all types. Each side would have total freedom to mix its forces under that cap. The arms control community—again bowing to existing canon—will object to the "optics" of "increasing the cap" from New START's limit of 1,550 deployed strategic nuclear weapons (which is really about 2,300-2,500 given the way bomber weapons are counted) to 3,500 total weapons, but the willful refusal to acknowledge and count tactical and mid-range weapons ignores the very real danger those weapons pose.

Moscow will likely counter by seeking to include U.S. hypersonic weapons and missile defense systems. The United States should not agree to discuss either. First, the United States (unlike Russia—or indeed China) has no current or planned nuclear-tipped or dual-capable hypersonic systems: the Army, Navy and Air Force programs which the Pentagon is pursuing are still in advanced development and are in any event conventional only. Russia and China have each deployed nuclear armed hypersonic systems. Second, the Navy hypersonic systems are a vital response to Russian and Chinese deployment of anti-access/area denial (A2AD) systems, and would be absolutely essential in wartime. If a separate agreement involving conventional hypersonic systems is to be contemplated, it ought to include calling for permanently dismantling the A2AD complexes those U.S. systems are being deployed to counter (and this would have to extend to cover those built by China on the artificial islands President for life Xi promised never to militarize). While hypothetically attractive from a deterrent and national security perspective, this is a completely unlikely outcome and therefore should not be pursued.

The poisonous politics of missile defense in both Washington and Moscow argue that no agreement acceptable to one side will ever be acceptable to the other. (Indeed, it was the missile defense issue which prevented START II from entering into force and thereby from eliminating MIRVed ICBMs in the 1990s.) Seeking to incorporate missile defenses into an agreement would prove to be a time-consuming sideshow which would have great potential to derail any progress which might have been made on nuclear weapons.

At the end of the day therefore, "talks on strategic stability" translates realistically into "talks about further limits on U.S. and Russian nuclear weapons." Establishing an overall limit would represent progress. Anything less would not. No deal is better than a bad one.

PROCEEDINGS

The "Action-Reaction" Arms Race Narrative vs. Historical Realities

The remarks below were delivered at a symposium on "The 'Action-Reaction' Arms Race Narrative vs. Historical Realities" hosted by National Institute for Public Policy on March 29, 2021. The symposium was the occasion for the public rollout of a new National Institute study on the topic. The study is available at https://nipp.org/wp-content/uploads/2021/04/Action-Reaction-pub.pdf. An abbreviated version of the study was published as an Occasional Paper and is available at https://nipp.org/wp-content/uploads/2021/06/OP-6-final.pdf.

Keith B. Payne
Keith B. Payne is a co-founder of the National Institute for Public Policy, professor emeritus of the Graduate School of Defense and Strategic Studies at Missouri State University and a former deputy assistant secretary of defense.

I am very happy to welcome you all here to this online symposium, and to provide a few opening remarks.

Today we have a wonderful set of speakers to discuss a 200-page National Institute study completed in 2020 and approved for release by DoD in February. The study was extremely well led by my colleague Dave Trachtenberg, with substantial contributions to the text by Michaela Dodge and me, and a very useful, bipartisan oral history section.

Many thanks to all who participated in that oral history, and to the Smith Richardson and Scaife Foundations for making this study possible. A PDF copy will be emailed to all who have joined us today.

This study consciously builds on and updates the outstanding and original work done by Albert Wohlstetter and Colin Gray in the 1970s—work that unfortunately seems largely to have been forgotten at this point.

Our speakers will go into some detail regarding the findings from this study; I will take a few minutes to provide a brief synopsis.

The focus of the study is on the "action-reaction" narrative regarding arms racing, and how it typically is used to argue against U.S. policy and force posture initiatives. In short, critics of U.S. arms and policies virtually always claim that U.S. arms programs are both unnecessary and will be the trigger for opponents' arms racing reactions--hence there is U.S. culpability for the arms race. This is the "action-reaction" narrative.

The corollary of this narrative is the policy line that if only the United States would stop its nuclear programs, opponents would likewise stop their nuclear building programs. U.S. *inaction* supposedly will trigger opponents' *inaction*.

Why so? Opponents will stop arming because they deploy nuclear weapons only to deter us. When we stop threatening opponents by building nuclear arms, they supposedly will relax and stop building themselves—they will no longer need to build to preserve their deterrent. Just as our *actions* supposedly drive their *reactions* and the arms race, our *inaction* will lead to their *inaction*.

Note that this action-reaction narrative portrays opponents as benign cogs caught in an arms race dynamic driven by the United States. Consequently, the solution to arms racing is obvious: the United States must stop the arms race by first stopping its own programs; opponents will then similarly stand down. In short, it is the U.S. responsibility to replace action-reaction arms racing cycles with inaction-inaction. Doing so, it was said in the 1960s, would replace the "arms race" with a "peace race."

It is hard to imagine a more simplistic, reductionist explanation of the arms race and its solution. But this narrative has been extremely useful politically. The obvious prescription for ending nuclear arms racing is for the United States to stop its missile defense and nuclear rebuilding programs. We have heard these claims repeatedly since the 1960s.

The National Institute study we're discussing today addresses the continuing expressions of this "action-reaction" arms race narrative and its corollary "inaction-inaction" narrative. They again are the basis for frequent assertions that if the United States will only stop its nuclear programs, opponents will also stop building their nuclear forces—i.e., current U.S. efforts to maintain its deterrence capabilities, yet again, are to blame for the "arms race." This argument has not changed since the 1960s; only the names have changed.

This action-reaction narrative is not now, nor has it ever been scholarly or empirically based. It is simply another facet of the "blame America first" mentality and revisionist Cold War histories that portrayed the United States as at fault for the Cold War—yes, Joseph Stalin, Nikita Khrushchev and Leonid Brezhnev supposedly were benign victims reacting to U.S. hubris and expansionism.

Sound research has repeatedly revealed that this U.S.-led action-reaction/inaction-inaction narrative is generally bogus. Yet, it is a supposed "law" of international relations and has been used to criticize every U.S. strategic policy development and cycle of U.S. nuclear rebuilding since the 1960s, whether undertaken by a Republican or Democratic Administration.

Commentators have used it to oppose:

- President Johnson's late 1960s Sentinel BMD program;
- President Nixon's Safeguard BMD program of the early 1970s;
- the 1974 Schlesinger Doctrine;
- President Carter's 1980 Countervailing Strategy;
- the Reagan Administration's 1980s nuclear modernization program;
- President George W. Bush's 2004 deployment of rudimentary strategic ballistic missile defense; and,
- The strategic nuclear programs of Presidents Obama and Trump.

Some NATO allies are now even using the same action-reaction narrative to criticize the apparent British decision to add modestly to its nuclear arsenal, arguing it will now cause an arms race. This criticism comes from Germany's Foreign Minister, even while senior Russians themselves say there is no need to respond—perhaps because Russia has been sprinting with nuclear arms for over a decade.

The inconvenient truth is that the incessant charge of a U.S.-driven action-reaction arms race almost always is contradicted by actual historic facts. Since the 1960s, U.S. initiatives and actions, including all those I mentioned above, were *reactions to opponents' armaments programs and aggressive foreign policies*—not the dynamic behind their arms racing.

This is why Colin Gray entitled his 1976 book on the subject: *The Soviet-American Arms Race*, not *The U.S.-Soviet Arms Race*. Colin's word order choice for his title set the record straight regarding the dynamics of the nuclear arms competition.

In addition, U.S. inaction has not led to opponents' inaction—as confidently predicted based on the inaction-inaction narrative. In fact, in some cases we know that U.S. inaction has spurred opponents to greater armament action and assertiveness. Most obviously, U.S. *restraint* on nuclear testing to yield has not been reciprocated by Russia, as was acknowledged officially last year.

And, in the 1960s and 1970s, domestic opponents of BMD continually assured us that US *inaction* on missile defense would lead to the cessation of further Soviet ICBM deployments—that certainly is how the 1972 ABM Treaty was sold to the U.S. Senate. However, according to General Nikolai Detinov, a key player in Soviet arms control, the ABM Treaty instead freed the Soviet Union to concentrate its resources on its next generation of MIRVed ICBMs—just the reverse of the promises based on the inaction-inaction narrative. U.S *inaction* actually was followed by breathtaking Soviet *action*. The same pattern is true today; again only the names have changed.

This harsh reality of international relations should no longer shock anyone. But we, as a community, appear to want to deny the reality of what Albert Wohlstetter and Colin Gray

taught us decades ago, and this study demonstrates anew: that is, there are many possible forms of arms interaction; but actual history shows that the action-reaction and inaction-inaction arms race narratives are bogus as continually used by commentators to criticize U.S. policy initiatives and arms programs.

With that brief overview, I would like to introduce today's great lineup of speakers and invite their remarks on this study.

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David J. Trachtenberg
David J. Trachtenberg is Vice President of the National Institute for Public Policy and former Deputy Under Secretary of Defense for Policy.

Thank you, Keith, for providing the introduction and background context for this symposium. I think this webinar is a good complement to the one we held last month on the U.S. nuclear modernization program.

National Institute undertook this study in part because many of the contemporary arguments being raised by critics of the current U.S. nuclear modernization effort—for example, that U.S. actions will cause an arms race or destroy chances for arms control—are eerily reminiscent of the arguments raised by opponents of U.S. strategic programs over many decades. In many cases they are identical. So, we thought a review of these arguments and how they stack up in light of the historical record would not only be a useful exercise but would provide some important context for assessing the validity or invalidity of similar assertions today.

The narrative of a "mindless" action-reaction arms race is not a new phenomenon. Nor did it originate with the emergence of the nuclear era and the start of the Cold War. Predictions of a mechanistic action-reaction dynamic pre-date recent history and are reflected in arguments over armaments building that date back centuries.

Our study identified various inflection points during the Cold War and post-Cold War periods when U.S. strategic offensive and defensive developments were thought by many to be the first-cause drivers of an "action-reaction" arms race. For example, in the 1980s, Senators Edward Kennedy (D-MA) and Mark Hatfield (D-OR) argued that the Reagan Administration's nuclear programs would place the world "at the starting line of a new round in the arms race."[1] W. Averell Harriman, former U.S. Ambassador to the Soviet Union, lamented what he called "a nuclear arms race rapidly escaping out of control—and dangerously passing the point of no return."[2]

Similarly, some domestic critics of the Strategic Defense Initiative (SDI) program predicted that "SDI will surely complicate efforts at arms control and stimulate an intensified arms

race."[3] Others predicted SDI "would guarantee an accelerated offensive arms race."[4] Of course, neither an arms race nor the demise of arms control came to pass. Indeed, the SDI program, coupled with the Reagan buildup, has been credited with helping to facilitate the ultimate demise of the USSR—not a bad outcome for the world.

Interestingly, however, similar arguments are being heard today asserting that limits on the U.S. missile defense program are necessary to facilitate additional arms control agreements with Russia. As Jeffrey Lewis recently wrote, "If [President] Biden wants to slow this arms race, he will need to accept limits on U.S. missile defense systems…. If the Biden administration is serious about reviving arms control agreements with Russia and bringing China into the fold, it will need to compromise."[5]

Last year, one analyst accused the Trump Administration of "jumpstarting the 21st century arms race"[6] with its nuclear modernization plans—plans which, by the way, were mostly a continuation of the program endorsed by the Obama Administration. The only deployed supplemental nuclear capability is the low-yield ballistic missile warhead, which has resulted in a decline in the overall destructive power of these weapons—hardly a condition associated with arms racing.

I would argue that some of the contemporary criticism has been hyperbolic—for example, the Bulletin of Atomic Scientists moved its so-called "doomsday clock" ahead to only 100 seconds to midnight—the closest it has come to "apocalypse" at any time in its history, even at the height of the Cold War—reflecting concerns that "a renewed nuclear arms race…will, if unaddressed, lead to catastrophe sooner rather than later."[7]

Similarly, as Keith mentioned, many argued that U.S. restraint in strategic programs would engender similar restraint on the other side—in other words, an "inaction-inaction" corollary.

These "action-reaction" and "inaction-inaction" arguments were voiced during the debate over the 1972 ABM Treaty; the development of Limited Nuclear Options in the 1970s; the Carter Administration's "Countervailing Strategy"; the Reagan Administration's nuclear build-up and SDI program in the 1980s; the Bush Administration's withdrawal from the ABM Treaty and initial deployment of homeland missile defenses in the early 2000s; and the modernization programs initiated by the Obama Administration and carried forth by the Trump Administration.

For example, one analysis concluded that the ABM Treaty, by leaving both the United States and Soviet Union "unambiguously hostage to each other," would "eliminate the forces driving the offensive arms race."[8] That of course was wishful thinking. Despite contentions at the time that the ABM Treaty's prohibition on nationwide missile defenses would remove any incentive for the Soviets to build up their offensive forces, the greatest increase in Soviet offensive nuclear capability came after the signing of the ABM Treaty. This, despite then-Secretary of Defense McNamara's confident prediction that the treaty "removes the need to race—there is no reward for getting ahead."[9] Apparently, the Soviets begged to differ.

The same arguments are also being voiced today by opponents of the current U.S. nuclear modernization program. Recent articles have warned ominously of a new spiral in the arms race between the United States and Russia—initiated by the U.S.—if the U.S. goes forward with current nuclear modernization plans. Tom Countryman, Chairman of the Arms Control Association's Board of Directors and a former Assistant Secretary of State, has stated that "we will touch off—gradually at first, and then rapidly—an open-ended nuclear arms race."[10]

What our study found is that there has been a huge gulf between the arguments of those who predicted that U.S. developments would be the catalyst for a U.S.-driven arms race and the reality of Soviet, then Russian, behavior. In fact, in every case we analyzed, the predictions of the critics turned out to be false.

For example, neither the assumption that SDI would initiate another spiral in the U.S.-Soviet arms race, nor the contention that abandoning SDI would remove the Soviet Union's incentive to expand its own strategic offensive and defensive capabilities were validated by history. The Soviet Union continued to expand its offensive and defensive capabilities before the SDI was announced and similarly after the SDI was reduced to a development program only in continuing strict compliance with the ABM Treaty.

Moreover, the SDI program, coupled with a major nuclear modernization effort implemented by the Reagan Administration, occurred at the same time the Soviet Union negotiated the Intermediate-range Nuclear Forces (INF) Treaty—which eliminated an entire class of ground-based nuclear missiles—and demonstrated the fallacy in the arguments of whose who insisted such developments by the United States would make arms control agreements impossible.

The narrative proffered by critics of U.S. strategic offensive and defensive programs—namely, the familiar action-reaction and corollary inaction-inaction contentions—is simply not supported by history. Indeed, in some cases, U.S. action or inaction was followed by adversary behavior that was precisely the opposite of what proponents of the action-reaction theory of arms racing predicted, including U.S. action that led to Soviet inaction, and U.S. inaction that led to Soviet action. For example, President George W. Bush's withdrawal from the ABM Treaty and move to deploy missile defenses against rogue state missile threats

coincided with an arms control treaty sought by Russia, the Moscow Treaty, which mandated the deepest reductions in strategic offensive nuclear arsenals of any such agreement.

In other cases, U.S. inaction encouraged adversary actions, such as when the United States ceased deployment of strategic missile defenses under the ABM Treaty, thereby creating an opportunity (as stated explicitly by Soviet senior military leadership) for the Soviet Union to channel resources into the expansion of Soviet ICBM capabilities. Or when the United States failed to respond to Soviet arms control violations, which only encouraged additional Soviet (and subsequently Russian) cheating, leading to a breakdown in the fabric of arms control agreements and the withdrawal by the United States from the INF and Open Skies treaties.

There are numerous other examples that demonstrate the fallacy of the action-reaction and inaction-inaction narratives as they have been applied to U.S. strategic programs and developments and used in the public debate. Indeed, it appears that the narrative that U.S. strategic developments spark dangerous reactions by others and that U.S. strategic restraint will set an example that others will follow is premised on an assumption that other governments are either unwilling or incapable of deciding for themselves what their own national security requires, and simply react to U.S. developments. The belief that the United States sets the scope, pace, and direction of others' armament activities, and that the power of U.S. strategic restraint will guide others similarly, reflects what I think could be called a form of cultural arrogance that is unsupported by the historical record.

Nevertheless, there are those who have sought to characterize the action-reaction metaphor as an immutable law of physics. For example, in the 1980s, Senators Kennedy and Hatfield argued, "In nuclear weapons lore, Newton's third law of motion has proved to be the first law of upward movement in the arms race: for every action, there is an equal and opposite reaction."[11] Clearly, there have been interactions in U.S and Soviet (and subsequently, Russian) armament programs—and our study acknowledges this. Yet, in no case has the United States been the lead cause of an action-reaction arms race.

Our study, which builds on the outstanding arms race analyses of Colin Gray and Albert Wohlstetter from the 1970s, concludes that in light of historical developments, arguments about the United States initiating or driving an arms race by virtue of its own nuclear modernization programs are not only wrong but seem to reflect an ideological predisposition to posit U.S. culpability for arms racing. Assertions have remained constant over decades that U.S. nuclear weapons programs are the cause of arms racing and that U.S. restraint will be followed by opponent restraint. These assertions appear largely to be politically inspired speculation that contradicts available empirical evidence. Such ominous predictions remind me of the comment attributed to the legendary New York Yankees manager Yogi Berra, who said: "It's tough to make predictions, especially about the future."[12]

As Colin Gray noted decades ago, "It may be revealed that in practice there has not been a Soviet-American arms race since the late 1940s."[13] And as he and Keith Payne wrote a

decade later, "The Soviet Union historically has not taken direct action in response to U.S. deployment of a new type of military system."[14]

Finally, I would call attention to a RAND study done in 1972 by Andy Marshall, which concluded:

> Commonly used hypotheses about the nature of the strategic arms race, or about the U.S.-Soviet interaction process (claiming a closely coupled joint evolution of U.S. and Soviet force postures), are either demonstrably false or highly suspect…. It is alleged that the United States is racing with itself, that U.S. initiatives are the sole cause of the continuing and expanding strategic arms race. It is striking how few data are presented to support these assertions…. The current public discussion of the presumed strategic arms race is almost data- and fact-free…. To summarize, there is no spiraling arms race, either in total military budgets and force sizes or in strategic-area budgets and force sizes. There is no clear-cut, well-documented rapid action-reaction cycle.[15]

Interestingly, at the same time, Marshall made this recommendation: "If possible, an unclassified version of the history of the arms competition and hypotheses concerning the interaction process should be produced so as to reach Congress and the public. The field cannot be left to the arms control enthusiasts and their exaggerated views of the 'arms race.'"[16]

This is precisely what our study sought to do, with the benefit of additional historical hindsight since then. Looking at various inflection points from the 1970s until the present, our study concludes—just as Andy Marshall, Colin Gray, and others concluded—that the well-worn narrative of a "U.S.-driven 'action-reaction' arms race" has not been borne out by history.

Our study was also informed by interviews with more than a dozen former senior U.S. government officials, on a bipartisan basis, with knowledge of and expertise in these matters. Some of them are quoted in our study. Without exception, all challenged the validity of the action-reaction arms race narrative as it has been used in the public debate. None of the participants interviewed described U.S. motivations as based on a mechanistic action-reaction arms race dynamic or a desire to match Soviet deployments either in numbers or system types.

There was also significant consensus around the proposition that the U.S. strategic restraint was not matched by similar restraint on the part of the Soviet Union. Several participants sought to emphasize the point by citing the statement of former Secretary of Defense Harold Brown, who noted, "When we build, they build; when we cut, they build."[17] Indeed, the consensus of the group was that the corollary proposition that U.S. restraint in nuclear developments would encourage or be matched by similar restraint on the part of others,

including Russia, not only lacks intellectual credibility, but is being put forward despite historical evidence that proves it is wrong.

In conclusion, by citing the U.S.-driven arms race assertions and predictions of those who opposed U.S. strategic offensive and defensive programs over the last 50 years—and contrasting them to historical realities—our study provides what I think is a clear refutation of the U.S.-driven action-reaction arms race narrative as it has repeatedly been employed in the public debate.

I think the study makes a useful contribution to understanding the facts and puncturing the myths associated with this narrative. And I think it is especially useful at this point in time, when the U.S. nuclear modernization program is being challenged by those who continue to assert that U.S. action will spark a new and dangerous spiral in the arms race.

In this context, the study should also be useful for today's policy practitioners and decision makers who need to decide where the United States should go with respect to its strategic forces. Should the Biden Administration proceed with its own nuclear posture review, it will hopefully be informed by the evidence presented in this study.

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Michaela Dodge
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In my remarks, I will talk about the term arms race. Then I am going to discuss three inflection points that in my mind best illustrate the argument we are making in the study.

On Arms Races

The first muddle we had to sort through when we started working on the study was deciding how to define the term arms race. This is rarely done in the public discourse. The term itself has taken on a pejorative meaning. That is because if one doesn't define the term, he doesn't have to do the difficult work of being conceptually clear. He can artificially increase the level of emotion in the debate.

A lack of conceptual clarity absolves its users of responsibility to consider causal mechanisms and weight of different factors that undoubtedly bear on a state's decision to pursue weapon systems. Most importantly, arms races are not mechanistic and insulated from the overall context of international relations. They are about political hostilities and conflicts of interest, as strategist Colin Gray pointed out over four decades ago.

And it is his definition we are using in our study.[18] Our inflection points covered time periods in which the United States could be considered in an arms race but also a few in which it was not. The study proves beyond doubt that U.S. actions and programmatic choices with regard to its nuclear forces are not the primary driver behind other states' nuclear programs. Of course, it would be foolish to deny an interaction between our and adversary's defense programs.

Foregoing Missile Defenses

Our first inflection point was the U.S. decision to forego missile defense programs in the early 1970s. The decision comported with the mutually assured destruction doctrine that took hold of the Pentagon nuclear and budget planning in the 1960s.

The argument went that if the United States pursued a missile defense system the Soviets would add too many long-range missiles. A U.S. missile defense system would make achieving an arms control agreement with the Soviet Union all but impossible while an ABM Treaty limitation "would break the action-reaction cycle of the arms race."[19]

Little did the Americans know that the Soviets would actually accelerate its strategic offensive missile deployments, even as both countries concluded the ABM Treaty and the United States forego all missile defense deployments. As David Yost summarized, "the treaty plainly enabled the Soviets to avoid an expensive competition in a domain of U.S. technological advantage. By relieving the Soviets of a resource dilemma, the ABM Treaty allowed them to invest more in other capabilities, including ICBMs."[20]

The Carter/Reagan Build Up

Second, the combination of Soviet nuclear weapons modernization and increased international belligerence, including the Soviet invasion of Afghanistan in 1979, led to a reassessment of U.S. nuclear policies and programs. The Reagan Administration built upon the NSDM-242 and PD-59 and conducted what became the last U.S. comprehensive nuclear modernization effort. We also had the Pershing II deployments to Europe and started serious research on missile defense systems.

The criticisms were predictable. Senators Kennedy and Hatfield called the Reagan Administration's policies "the starting line of a new round in the arms race."[21] Ambassador Harriman complained that "if present developments in nuclear arms and United States-Soviet relations are permitted to continue, we could face not the risk but the reality of nuclear war."[22] Senator John Kerry said that we cannot have missile defense and arms control at the same time.[23] These criticisms sound familiar, don't they?

Yet, the Reagan Administration's policies undoubtedly contributed to the exhaustion of the Soviet regime and its demise. They also contributed to the most successful Cold War arms

control agreement: the INF Treaty. On other words, a complete opposite of what the proponents of the U.S.-led arms race narrative predicted.

The End of the Cold War and the End of History

Third, the time period after the end of the Cold War is definitionally not an arms race, although it further discredits the myth that U.S. actions are the primary motivator for other countries' strategic choices. One of my favorite quotations in the study was Jerome Wiesner's 1970 statement that U.S. unilateral actions reducing the nuclear arsenal "could even start a peace race."[24] Since the end of the Cold War, the United States took several unilateral measures to reduce its arsenal and decrease the role of nuclear weapons in its national security strategy. Yet we are not closer to a peace race than we were in the 1970s.

In the early 1990s, these steps included nuclear reductions, re-focus on nonproliferation and nuclear terrorism, stop to nuclear warhead testing and other modernization activities. We took bombers off alert and reduced our fleet of airborne command and control aircraft. The 1994 NPR called for a "lead but hedge" strategy and while we did quite a bit of leading, we were never that good about hedging.

We retired the MX Peacekeeper from the active inventory in 2005 and converted the B-1 bombers to a conventional-only role. U.S. strategic nuclear weapons declined by more than 60 percent—from approximately 6,000 under the 1991 Strategic Arms Reduction Treaty (START) to 1550 accountable under New START.

We've seen Russia's inventory decline and the modernization program retard in the 1990s. Soon enough, it was clear that Russia's reduction steps were more impacted by a lack of funding rather than a response to U.S. initiated reductions. We know this because once Russia started to be better off fiscally, it restarted investments in its nuclear modernization program. New nuclear armed adversaries emerged, including North Korea, Pakistan, and India. And China is on track to double the number of nuclear warheads.

Conclusion

Perhaps, it is no surprise that the U.S.-led arms race narrative changed so little in the past 40 years. If every U.S. action can be interpreted as an incentive for adversaries to pursue their programs, we avoid an unpopular discussion about whether our goals are more legitimate or better than the other guys'. We don't have to worry about reasons why our adversaries pursue their programs. As Cap Weinberger said, the term arms race "implies that our efforts to counter the military threats that we face are really as devoid of philosophical impulse and are empty of any broader significance than a sporting event." The term is "rather flip diminishment and deprecation of what I think has to be one of the noblest enterprises of man which is the defense of freedom."[25]

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Thomas G. Mahnken
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This is an important study. It deserves a prominent place as part of the growing body of literature that seeks to understand the extent to which the U.S.-Soviet competition during the Cold War actually played out in accordance with the predictions of international relations theory.[26] Specifically, this study is about the application of the "arms race" metaphor to the practice of strategy during the Cold War.

Metaphors are powerful[27] and can be particularly persuasive when they align with the preconceptions of those who use them.[28] The more often a metaphor is applied, the greater weight it carries and the more likely it is to be accepted. Similarly, the more it is applied the more that nuance and subtlety get drained from it.[29]

The "arms race" metaphor has been attractive because it is simple and catchy. Moreover, there is clearly something to it: the United States and Soviet Union clearly did interact with each other during the Cold War. American arms decisions clearly influenced those of the Soviet Union, and vice versa. But labeling that interaction an arms race runs the risk of falling prey to a couple of fallacies.

First, there is the Fallacy of Perfect Interaction: the notion that the Cold War was a sort of "Gunfight at the OK Corral," with the two gunfighters staring intently at one another from opposite ends of a dusty, deserted street, each focusing on the other's gun, holster, and hand. Clearly the United States and the Soviet Union devoted a lot of attention to one another, but the historical record shows that in practice their attention was less focused and more prone to misperception than arms race theory would suggest.

Second, and relatedly, there is the Fallacy of Agency, also known as Strategic Narcissism: the notion that a competitor responds almost mechanically to the actions of its adversary rather than acting to achieve their own political objectives. Ultimately, such a fallacy denied the competitors agency. Again, what we know about the way the Cold War actually unfolded is at variance with this view.

The present report does an excellent job of exploring the application (and misapplication) of the arms race metaphor during the Cold War. It also suggests the way ahead for research in this area. For example, it would be useful to delve even deeper into American and Soviet arms decisions and the extent they were influenced by statements and actions of the other superpower, as opposed to being shaped by organizational culture, bureaucratic routine, the push and pull of technology, industrial considerations, or other factors. Such a project would be ambitious, but there is precedent in the studies of the U.S.-Soviet strategic interaction

performed by Andrew W. Marshall and by Ernest May, John Steinbruner, and Thomas Wolfe during the 1970s[30] as well as more recent attempts to assess strategic interaction among the United States, Russia, and China.[31] Such an effort would face challenges, to be sure, to include data availability and classification, but is also likely to yield the sort of insight that can enrich our understanding of strategic interaction and help insulate us against the mindless recitation of metaphors.

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[14] Keith B. Payne and Colin S. Gray, "Nuclear Policy and the Defensive Transition," *Foreign Affairs*, Vol. 62, No. 4 (Spring, 1984), p. 835, available at https://www.jstor.org/stable/20041909.

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[16] Ibid., pp. 51-52.

[17] Harold Brown testimony before a joint House and Senate Budget Committee meeting, 1979, quoted at https://www.bartleby.com/73/400.html.

[18] For the purposes of this study, an arms race is defined as a relationship between "two or more parties perceiving themselves to be in an adversary relationship, who are increasing or improving their armaments at a rapid [emphasis in the original] rate and structuring their respective military postures with a general [emphasis in the original] attention to the past, current, and anticipated military and political behavior of the other parties." See Colin S. Gray, "The Arms Race Phenomenon," *World Politics*, Vol. 24, No. 1 (1971), p.74, available at https://doi.org/10.2307/2009706.

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PROCEEDINGS

Prospects for U.S. Nuclear Modernization

The remarks below were delivered at a symposium on "U.S. Nuclear Modernization" hosted by National Institute for Public Policy on February 23, 2021. The symposium focused on contemporary issues in the U.S. nuclear modernization program and prospects for the future.

Franklin C. Miller
Franklin C. Miller is former Special Assistant to the President and Senior Director for Defense Policy and Arms Control.

I have been asked to lead off today's discussion by speaking to three topics in particular:

- The U.S. modernization record and previous U.S. nuclear modernization cycles;
- Comparing U.S. nuclear strategy and posture to that of near-peer adversaries; and
- The impact of declaratory policy on deterrence.

Each of these topics could be the subject of an entire symposium, but I will summarize my comments briefly.

Modernization

Let me begin by asserting that we are at a critical moment with regard to the viability of the U.S. strategic deterrent in the 2030's and beyond. Although I hate to use that now-overused phrase, "inflection point," that is really where we are today. It is worth remembering that the foundations of today's Triad—the Minuteman ICBMs, the SSBN force, and the B-52s—were laid in the last years of the Eisenhower Administration and in the early years of the Kennedy Administration. Twenty years later, the Reagan Administration picked up and expanded programs, which began their gestation in the Ford and Carter Administrations, to recapitalize the Triad.

Twenty years after that, the George W. Bush Administration should have undertaken a similar recapitalization but did not. There were two reasons for this. First was a fundamental misreading of the aims and intentions of Vladimir Putin. Second was a monocular focus on the wars in Iraq and Afghanistan without regard to developments in the wider world.

And so, we find ourselves today relying on the fruit of the Reagan program, but that fruit is overripe. We have a force which will shortly require modernization or retirement: there is little ground in between.

Let's look at a few examples.

The ALCM-B air-launched cruise missile entered service in 1982 with an expected operational life of 10 years; it is still in the force today. It is plagued with reliability problems and is no longer sufficiently stealthy to evade the most modern enemy air defenses. Without its replacement, the Long Range Stand Off (LRSO) weapon, the B-52s' role in our nuclear deterrent disappears.

In addition, with regard to the bomber force, there are only 19 B-2s, and yes, these airplanes are also approaching their 30-year point. A force that small cannot be sustained for a lifespan like that of the B52, which is now entering its seventh decade of service. The B-21 aircraft is vital to augment and then replace the current fleet of B-2s.

The Ohio-class ballistic missile submarines (SSBNs) will have to begin retiring in the early 2030s at an approximate rate of about one per year; the replacement program for building Columbia-class SSBNs is now on track, but it must be kept on track. Dangerous ideas such as slipping the schedule or reducing the proposed buy of a minimum of twelve boats will cause major perturbations in the industrial base, resulting in increased cost and further delay.

As a former official, I can say that one thing which bureaucrats do not understand or appreciate is how major industrial programs operate. The Columbia program must be kept on pace. And by the way, the focus on the SSBNs—while necessary—ignores the fact that the Trident II missile system also requires updating and eventual replacement. In the last budget cycle, the Congress slashed funding for work on the D5 life extension (LE2) program, which is designed to keep the missile viable until the mid-to-late 2030s. If funding for that work is not restored and the program not allowed to proceed, we could well face a crisis in the so-called backbone of our nuclear deterrent in the next decade.

The debate over the Ground-Based Strategic Deterrent (GBSD) is one of which you are all aware. However, you may not be aware that the GBSD program has three parts: the missile itself, the physical infrastructure of silos and launch control facilities, and the command and control (C2) system. All three of these major subsystems have been life extended over the past 50 years, but we have reached the end of our ability to continue to do so. We cannot extend this fifty-year-old system another several decades. The GBSD program integrates the modernization of all three elements. If you want a viable Triad, you must proceed with GBSD.

So, we are now facing the unhappy need to modernize across the board because of our failure to begin modernizing at least some elements of the strategic Triad in the George W. Bush

years. But make no mistake, there is not a lot of time left. As former Secretary of Defense Ash Carter put it in 2017:

> The Defense Department cannot further defer recapitalizing Cold-War era systems if we are to maintain a safe, secure, and effective nuclear force that will continue to deter potential adversaries that are making improvements in their air defenses and their own nuclear weapons systems. The choice is not between replacing these platforms or keeping them, but rather between replacing them and losing them altogether.[1]

Comparative Strategy

The issue of comparative strategy is an interesting question which deserves its own seminar. U.S. nuclear deterrent policy is virtually unchanged since the Kennedy years; our nuclear weapons serve to deter nuclear attack on ourselves and our allies and, as a last resort, to deter major non-nuclear strategic attack.

Over the past decade and a half, Russian nuclear strategy has evolved into one seeking to menace and intimidate Moscow's neighbors (who also happen to be our allies). It also appears that the Kremlin leadership contemplates the use of low yield nuclear weapons to consolidate aggressive gains accomplished by conventional means. Chinese nuclear strategy remains, as it always has been, opaque, but there are emerging suggestions that Beijing is studying the Russian model.

So, the difference between the U.S. approach to nuclear weapons as a defensive tool, and the Russian and possibly Chinese approach to those weapons serving as offensive tools, could not be clearer.

There is a second difference in the way we and our potential major adversaries look at nuclear weapons. The Russian and Chinese military leaderships have evolved an all-encompassing view of future war, which integrates elements of gray area operations, conventional attack, cyber attack, and nuclear weapons. The United States continues to view nuclear weapons as something almost disconnected from other uses of our military power. The line in the Department of Defense is usually: "We don't need to think about that—its STRATCOM's (U.S. Strategic Command's) problem." Yet, there is a critical need for us to understand what the other sides' holistic planning means and to at least begin to address it in our thinking if not in our planning.

[1] Ashton Carter, "Nuclear Deterrence: Still the Bedrock of US Security," *The American Interest*, April 6, 2017, available at https://www.the-american-interest.com/2017/04/06/nuclear-deterrence-still-the-bedrock-of-us-security/.

Declaratory Policy

Let me conclude by commenting briefly on the issue of declaratory policy.

Declaratory policy is the scene setter, not the scene. It expresses our peacetime aspirations and intentions, and as such is of great importance in explaining to friend and foe alike what we intend to do.

But deterrence rests essentially on the combination of capability and will. If we do not have the capability to underwrite our declaratory policy, we will appear weak and increase the odds of our being tested. If we do not demonstrate that we have the will to use our capability when we or our allies are threatened, we will be tested. In either case, deterrence is weakened.

It is not too fine a point to make that whether we follow through on strategic modernization is a test of both capability and will: capability, which if not modernized will be found lacking, and will to carry out the program on which deterrence rests in the future.

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John R. Harvey
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I want to thank David Trachtenberg, Keith Payne and the gang at NIPP for inviting me to participate before this very knowledgeable group and with the august members of this panel. What I hope to achieve in brief remarks is, first, to address the prospects for continued bipartisan support for modernization of U.S. nuclear forces in the new administration and Congress. Then I will do what David actually asked me to do which is review modernization with a focus on NNSA's role.

Many of us take as a given that U.S. nuclear forces help prevent major wars and promote strategic stability among the major powers. But the set of exquisite capabilities—the people who design, develop, secure, plan, operate and maintain nuclear forces and the associated R&D, manufacturing and operational infrastructure that supports this effort—are no less a factor in assuring allies and deterring adversaries. Over the next few decades this set of

[2] Many issues addressed in my remarks are developed in further detail in the following publications: John R. Harvey, "Modernizing the U.S. Nuclear Arsenal—The Road to 2030 and Beyond," in *Fit for Purpose? The U.S. Strategic Posture in 2030 and Beyond*, Brad Roberts, Editor, LLNL CGSR, October 2020 and John R. Harvey, "Anticipating the Biden Nuclear Posture Review," *Real Clear Defense*, September 9, 2021.

capabilities will be tested in very complex modernization programs that will involve the near simultaneous replacement of every leg of the aging triad, a major upgrade to the nuclear command and control (NC2) system that links nuclear forces with Presidential authority, and recapitalization of NNSA's aging warhead production infrastructure. There is little flexibility to absorb further triad modernization delay without affecting robust nuclear deterrence in future years. As former Secretary of Defense Ash Carter said: either we replace aging platforms and systems or we must remove them from service—there is no other choice.

On modernization, the first order of business is sustainment: ensuring that today's nuclear triad, U.S. dual-capable fighter bombers and associated NC2 remain operational until modern replacements are available. Recall the major replacement programs underway in DoD:

- Modernize the sea-based deterrent with a new Columbia-class ballistic missile submarine to replace the Ohio-class submarines deployed since the 1980s.
- Develop a follow-on ICBM—the so-called GBSD—to replace the aging Minuteman III (MMIII).
- Field a new B-21 strategic bomber.
- Field a Long-Range Standoff missile to replace the current air-launched cruise missile.
- Meet deterrence commitments to allies with a nuclear-capable F-35 Joint Strike Fighter deployed with the life extended B61-12 bomb.
- Develop and field, in the next decade, a nuclear-armed SLCM.
- Field a "next-gen" NC2 system that is responsive to both advancing threats and the evolving vision for modern conflict.

For NNSA, a no-less important series of programs is being executed:

- Complete on time and cost four warhead life extension programs—the B61-12 bomb, the W76-1 (now completed) and W88-alt SLBM warheads, and the W80-4 for LRSO.
- Field a low-yield warhead for the Trident D-5 SLBM (also completed).
- Plan to retain the B83 bomb in the nuclear stockpile.
- Accelerate by one year the W78 ICBM warhead LEP (called the W87-1).
- Start work on a next Navy SLBM warhead—the Mk7/W93.
- Advance concept and feasibility studies for a modern nuclear SLCM warhead.
- Carry forward nine large capital construction projects in various stages of execution. Among them:
    - Provide enduring capability and capacity to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030.
    - Restore safe, environmentally-sound manufacture of highly enriched uranium (HEU) components at the Y-12 plant.

  - Ensure the necessary reactor capacity, and availability of sufficient unobligated low enriched uranium (LEU), to produce an adequate supply of tritium for nuclear warheads.
  - Ensure continuity in U.S. capability to develop and manufacture secure, trusted rad-hard microelectronic systems beyond 2025 to support stockpile modernization.
- Sustain the personnel, computational, experimental, and test capabilities needed to assess annually the safety and reliability of the nuclear weapons stockpile as well as to design, develop, and produce modern nuclear warheads as needed in the future.
- Continue the process of transforming the NNSA itself, and its culture, to become an efficient, cost-effective, organizationally coherent entity for working cooperatively with the Department of Defense in overseeing the U.S. nuclear stockpile. More on this later.

There are three major risks to successful completion of this intensive modernization effort. First is program execution risk. Slips in individual programs, coupled with serious shortfalls in the aging warhead production infrastructure, can degrade deterrence from not having forces available sufficient to meet targeting needs. The entire work program reflects a modernization challenge not experienced in over 40 years, since the days of the Cold War, and we should anticipate significant technical and programmatic challenges in completing it on time and cost.

Second is the risk from evolving threats. The modernization program underway is not creating more nuclear weapons with exquisite new military capabilities, but simply replacing what we have today with modern versions. Is such a program sufficient to address threats that will evolve significantly over the 50-70 years that these systems are to remain in the field? More succinctly, is the force we are rebuilding the force we need for 2030 and beyond?

A third risk is to a continuing bipartisan consensus on modernization. Early in his second term, in part due to Mr. Putin's reckless behavior in Crimea, Mr. Obama moved out aggressively on nuclear modernization and received strong support from Congress, in part, because he packaged modernization with a commitment to avoid programs involving new warheads or fundamentally new military capabilities and completed the New START treaty (NST) with Russia.

The Trump team put together a nuclear review and modernization program for nuclear forces that drew on much of what it inherited from Mr. Obama. The 2018 *Nuclear Posture Review* (NPR) is thoughtful, balanced and in the mainstream of U.S. nuclear policy. As a result, bipartisan support in Congress for nuclear modernization continued. In the run-up to passage of the FY20 (and 21) National Defense Authorization Act (NDAA)Minuteman, for

example, there were few disputes between the Democrat-controlled House and the Republican-controlled Senate.[3] In the final bills, passed by both Houses, all issues in dispute were resolved favorably, and nearly all of the associated funding was appropriated consistent with the President's budget request.

Mr. Biden in his first week in office agreed to extend New START which, in my view, was a "no brainer", not necessarily for its purported benefits for strategic stability (of which there are some), or for its role advancing U.S. nonproliferation goals (highly arguable), or to assure allies (valuable), or for the transparency it provides into each other's nuclear weapons programs (highly useful). Rather, its most important benefit will be to foster continued bipartisan support for the modernization program.

Can we count on continued bipartisan support as the Biden administration, and the Democrat-controlled Congress, ramp up activities on the FY22 and 23 budgets? I am sort of a "glass half full guy" so let me touch on a few points about why I am optimistic:

- SecDef Austin, notwithstanding needed schooling on nuclear issues, very importantly reiterated in his testimony words from the past two presidential administrations along the lines that nuclear deterrence is DoD's Job #1.
- DepSecDef Hicks indicated strong support for the triad in her confirmation hearings.
- Colin Kahl, the nominee for Under Secretary of Defense for Policy (USDP), is pragmatic and a centrist.
- Leonor Tomero, while perhaps not a devotee of the Frank Miller-John Harvey-Keith Payne-Brad Roberts-Elaine Bunn-Rob Soofer school of nuclear policy, was an influential staffer on a committee that sustained nuclear modernization programs over six years and two Presidents.
- Sen. Jack Reed and Sen. Jim Inhofe, while reversing their roles as Senate Armed Services Committee (SASC) chair and ranking member, and with able support from key staff Jon Epstein and Adam Trull, are likely to continue in lockstep their bipartisan approach to modernization.
- Sen. Angus King, independent from Maine, and Nebraska Sen. Deb Fisher, a strong advocate for modernization, who become chair and ranking on the SASC Strategic Subcommittee, are likely to continue that tradition.
- Rep. Adam Smith, chair of the House Armed Services Committee (HASC), in his stated commitment to deterrence and in his realist view that Congress supports vigorous modernization and there's not much he can do to disrupt it, has not imbibed, so far, the Kool Aid from the anti-nukes.

[3] Areas of contention involved (1) whether to slow down GBSD, the replacement program for Minuteman III, by cutting its funding; (2) whether to cut funding for two NNSA programs (warhead pit production, the W87-1 LEP) that support GBSD; (3) whether to field a low-yield warhead for Trident; (4) whether to proceed on a study for a new nuclear SLCM; (5) whether to adopt a "no first use" policy; and (6) whether to retire the B83 bomb.

- Rep. Mike Rogers from Alabama, highly competent and knowledgeable about nuclear and space issues, is an apt replacement for the retiring Mac Thornberry, the ranking member on HASC, in working with Rep. Smith on modernization.
- Reps. Jim Cooper of Tennessee and Mike Turner of Ohio, both strong advocates for modernization and who just today held a hearing on Russia's aggressive modernization program, are now chair and ranking member, respectively, on the HASC strategic forces subcommittee.
- Sen. John Tester, Democrat from Montana and a backer of GBSD, is to chair the Senate Appropriations Defense Subcommittee.
- Finally, opponents of certain modernization programs are losing the debate. Those who oppose GBSD because they think we can stretch out MMIII a few more years, who don't believe we need to move forward with urgency on pits, who question the need for the W93, who would advance NFU in U.S. declaratory policy, or who would un-deploy the W76-2, simply have not made a compelling case for these actions to Congress or the American public. In the intellectual arena, they have come up short—rather than respond in their appeals to Congress to solid arguments opposed to their positions, they ignore them. Members of Congress and staff see this and react accordingly.

NNSA's Transformation

Let me turn to NNSA's transformation. Those who pay close attention to the evolution of the NNSA and its organization might agree that enormous progress has been made under the leadership of Lisa Gordon-Hagerty:

- Lisa has been a strong and effective manager, as well as a strong proponent of the prudent program initiated by President Obama and advanced by his successor to modernize the Triad. Very importantly, she has strengthened project management at NNSA, and set and advanced clear priorities for the work.
- She has taken a bipartisan approach in advancing nuclear modernization on the Hill and has gained the respect and trust of congressional members and staff from both sides of the aisle by fostering a highly effective partnership with Congressional Defense and Energy authorization and appropriations subcommittees.
- She has promoted "One Team" at NNSA, above all, by advancing cultural change within the organization. Along these lines, for the first time in NNSA's history (believe it or not!) she fully engaged NNSA's labs and plants in "drill down" deliberations on the nature, scope, and priorities of the nuclear weapons work program and the resources required to carry it out.
- She has taken hard decisions to manage risk within the nuclear enterprise by declining to implement recommendations of the Defense Nuclear Facilities Safety Board that do not provide safety benefits commensurate with their high cost.

- Lisa secured an unheard of, nearly 20%, plus up for nuclear modernization in the FY21 budget that was in essence fully sustained by Congress.
- They said it couldn't be done! She killed the abominable, grossly expensive, Mixed Oxide Fuel Fabrication (MOX) program and advanced a much cheaper approach—dilute and dispose—to getting rid of 34 MT of excess plutonium.
- Cooperation and transparency between the DoD and NNSA on the oversight of the U.S. nuclear stockpile is generally viewed by officials in both departments as perhaps being the best it has ever been under Lisa.
- The 2014 Augustine-Mies Report to Congress on NNSA, and many earlier studies and reports, highlighted shortfalls in many of these areas; Lisa Gordon-Hagerty, more than any other NNSA administrator to date, has produced results in addressing them.

She was fired last November in my view for only doing her job but that's another story that we can leave for the discussion. Leave it to say that the Biden nominee for the next NNSA administrator, still to be determined, will do well if he or she can carry forward the progress achieved by Lisa at NNSA.

Plutonium Pits

Let me turn to plutonium pit manufacture. During the Cold War the U.S. was producing 1000-2000 pits per year some years. Today we can hardly produce any. Recapitalizing U.S. plutonium pit production infrastructure, and increasing pit production capacity, is essential for a modern nuclear deterrent. From day one on the job, Lisa made pit manufacture her number #1 priority and has secured a way ahead on plutonium that has received bipartisan support.

First, we must answer the question: Why "no fewer than 80 pits per year by 2030?" There are three key reasons. Today, with a much smaller stockpile, known requirements for pit production 10-20 years out can be assessed and used to help size needed facilities. U.S. ICBM and SLBM modernization draw attention to two warheads—the W87-1 for GBSD and the W93 for Trident D-5 and its follow-on. Each will require newly manufactured plutonium pits—you simply can't get around that. Second, many pits in our stockpile are aging, will soon approach their estimated minimum lifetime, and will need to be replaced. Third, known production needs cannot be the sole sizing criteria for pit capacity. One must include some excess capacity for unknown contingencies including unanticipated technical problems (e.g., pits age out faster than we thought)[4] or to adverse geopolitical changes (e.g., Russian breakout requiring additional U.S. warheads in response). Thus, 80 pits per year is a

[4] Work carried out in the early 2000's culminated in a 2006 assessment of minimum pit lifetime to be in the 80–100-year range for what were then seen to be the most important pit failure mechanisms. At that time, a comprehensive work program was recommended to nail down additional uncertainties from other potential failure modes. A recent study by an NNSA advisory board concluded that this work program has not yet reached fruition.

judgement call and not tied to locked-in requirements. Eighty per year, by the way, is at the lower limit of my comfort level.

Today, pit production is done largely at two facilities at Los Alamos. Actual production is carried out in the highly secure PF-4 facility and involves the melting, casting, machining of plutonium pits, and related hazardous operations involving multi-kilogram quantities of plutonium. PF-4 storage capacity must accommodate in the range of hundreds of kilograms of plutonium, both as feed stock and finished pits. Analytical support to pit production—the so-called plutonium analytical chemistry and materials characterization work—has been carried out at the aging Chemistry and Metallurgy Research (CMR) facility and, if it hasn't already, will shortly transition to a new radiation lab. This work is inherently less hazardous because it entails lab analysis involving multi-gram-level, not kilogram-level, quantities of plutonium. Both PF-4 and CMR have been operating for over 40 years, and while safe and secure operations have been the norm and PF-4 seismic upgrades have been achieved, these two facilities do not meet all of today's modern safety standards.

The current plan is to establish 30 pits per year production capacity at Los Alamos National Laboratory's (LANL's) PF-4 by 2026 and, second, to field, at the former MOX facility in South Carolina, an additional capacity of 50 pits per year (for a total of 80 per year) by 2030.

We must not underestimate the technical challenge of building and certifying new plutonium pits for the stockpile. When we last produced pits in quantity in the 1980s, we were able to qualify pit manufacture with underground nuclear tests. Today, we must certify production technologies and processes that, no matter how much we try to tie it to previous processes and technologies, will inevitably have differences. The challenge for stockpile stewardship is to assess that these differences will not degrade pit performance. I am confident, the lab directors are confident, that the stockpile stewardship program can achieve this. But it is by no means a "slam dunk".

Conclusion

The U.S. nuclear arsenal beyond 2030 will not look much different from todays—there will be a Triad but a modern one with life-extended warheads and enhanced NC2. Some U.S. programs will be initiated or bolstered to respond to technological advances or evolutions in deterrence strategies. In taking such steps, the U.S. nuclear posture will continue to meet deterrence needs against any potential adversary. Very importantly, while Russia's aggressive modernization provides context for the U.S. program, it is not the cause of it—because of its aging systems, the U.S. must modernize whether or not Russia does. Lastly, the big uncertainty is, well, uncertainty. We should expect to be surprised and the means to respond to surprise—a robust and responsive nuclear R&D and industrial base—will be essential.

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As Deputy Secretary of Defense Kathleen Hicks indicated during remarks at her confirmation hearing, it appears the Department of Defense will begin writing a Nuclear Posture Review at some point in the near future, just as the Clinton, Bush, Obama, and Trump administrations have done previously, albeit in slightly different forms. My esteemed fellow panelists, having been involved in previous Nuclear Posture Reviews, can attest to the many different factors that influence how a Nuclear Posture Review can turn out—with some factors being obvious, like threat perceptions and defense budgets, and other factors perhaps less obvious, such as clashing personalities and organizational clout. When faced with these uncertainties, it is unwise to make bold predictions about the precise policies that the Biden administration will adopt in its Nuclear Posture Review, but the best guide may be to look back at where the Obama and Biden administration ended back in 2016 and early 2017.

Threat Environment

Beginning in 2009, the Obama administration sought a "reset" of the U.S.-Russia relationship, which arguably reached its zenith when both states signed the New START Treaty in 2010.[5] By 2014, however, the relationship had soured due to Russia's invasion of Ukraine, plus U.S. diplomats were privately conveying to their Russian counterparts their concerns about a missile system they believed might violate in the Intermediate Range Nuclear Forces (INF) Treaty.[6] By the next year, 2015, Obama administration officials testified that Russia was once again a serious threat; as one official described, Russia had become "… one of our most pressing and rapidly evolving strategic challenges…"[7] Soon after, then-Secretary of Defense Ash Carter began emphasizing that the United States was returning to an era of "great power competition" with Russia and China—a competition in which nuclear weapons played a significant role.[8]

[5] The White House, "U.S.-Russia Relations: 'Reset' Fact Sheet," *ObamaWhiteHouseArchives.gov*, June 24, 2010, available at https://obamawhitehouse.archives.gov/the-press-office/us-russia-relations-reset-fact-sheet.

[6] On the INF Treaty violating system, see, Daniel Coats, "Director of National Intelligence Daniel Coats on Russia's Intermediate Range Nuclear Forces (INF) Treaty Violation," *DNI.gov*, November 30, 2018, available at https://www.dni.gov/index.php/newsroom/speeches-interviews/item/1923-director-of-national-intelligence-daniel-coats-on-russia-s-inf-treaty-violation#:~:text=Earlier%20this%20week%2C%20Director%20of,violation%20of%20the%20INF%20Treaty.&text=The%20treaty%20banned%20GROUND%2Dlaunched,between%20500%20and%205%2C500%20km.

[7] Robert Scher, "Statement of Robert Scher, Assistant Secretary of Defense for Strategy, Plans, and Capabilities," House Armed Services Committee, Subcommittee on Strategic Forces, April 15, 2015, p. 10, available at https://www.hsdl.org/?abstract&did=794064.

[8] Ash Carter, "Remarks by Secretary Carter to troops at Minot Air Force Base, North Dakota," *Defense.gov*, September 26, 2016, available at https://www.defense.gov/Newsroom/Transcripts/Transcript/Article/956079/remarks-by-secretary-carter-to-troops-at-minot-air-force-base-north-dakota/.

By the end of the Obama administration, it was commonplace for U.S. defense officials to tout the importance of U.S. nuclear modernization, as typified by Secretary Carter's remarks at Minot AFB in September 2016: "America's nuclear deterrence is the bedrock of our security. And the highest priority mission of the Department of Defense."[9] In that same speech, Secretary Carter stated that recent Russian actions "raise serious questions about its leader's commitment to strategic stability," while China was "growing its [nuclear] arsenal in both quality and quantity." And how might nuclear weapons be employed in the future? Secretary Carter explained, "Today, however, it's a sobering fact that the most likely use of nuclear weapons is not the massive nuclear exchange of the classic Cold War-type, but rather the unwise resort to smaller but still unprecedentedly terrible attacks, for example, by Russia or North Korea to try to coerce a conventionally superior opponent to back off or abandon an ally during a crisis."[10]

In the nearly five years since Carter's speech, it is evident that the Obama administration's views of the security environment were largely shared by the Trump administration—that is, nothing in the past five years seems to indicate that the fears of growing nuclear threats were unfounded. Thus, the Biden administration, if it approaches a Nuclear Posture Review from the standpoint of a clear-eyed assessment of the nuclear threats in the world, as the Obama and Trump administrations did, then it will likely see a continued role for U.S. nuclear weapons to deter such threats and assure allies in the face of such challenges. Clearly the Biden administration may share many of the same threat perceptions as the Obama administration in its later years, but this does not necessarily mean that they will adopt the same approach to U.S. nuclear modernization as one of the means to counter those threats.

U.S. Nuclear Modernization

As part of the price for securing Republican support for passing the New START Treaty in the U.S. Senate, the Obama administration committed to modernize the U.S. nuclear arsenal—which at that point was needed across all three legs of the nuclear Triad of land-based intercontinental ballistic missiles (ICBMs), submarines (SSBNs), and bombers—not to mention nuclear command, control, and communication (NC3) and the nuclear infrastructure to produce warheads. At the time, the most controversial nuclear modernization programs were the B61-12 gravity bomb—which consolidated four different B61 types into one variant, and the new air-launched cruise missile–later called the Long-Range Stand Off Weapon (LRSO). One could make a good case that these weapons were controversial simply because they were the first in a series of modernization decisions, not because of any inherently destabilizing characteristic of the weapons. After all, the United States was consolidating four different weapon types into one modern and safe variant with

[9] Ibid.

[10] Ibid.

the B61-12—thus taking multiple weapon types out of the active U.S. stockpile. With LRSO, the Obama administration made spirited defenses testifying before Congress, arguing in part that the United States was simply replacing a capability it had had since the 1980s—a capability that would retain the deterrent effect of the bomber force, assure allies, and present a limited, prudent option for Presidents to consider should deterrence fail.[11]

Less controversially, the Obama administration began studies on modernizing ICBMs, replacing Ohio class SSBNs, and developing a new nuclear-capable bomber—and successfully persuaded Congress in most cases to fully fund each effort.

Incredibly, the current U.S. nuclear modernization program can without exaggeration be labelled the "Obama modernization program plus" as the Trump administration added only minor supplements to the modernization efforts it inherited from the Obama administration, namely the W76-2 low-yield warhead for submarine-launched ballistic missiles and the sea-launched cruise missile (SLCM). It is a testament to the adaptable nature of the U.S. nuclear Triad that even as threats shifted in the post-Cold War environment, both the Obama and Trump administrations continued finding value in a diverse set of mutually-reinforcing capabilities within the Triad—and then sought to modernize them, with only minor changes deemed necessary by the Trump administration. Even more remarkably, a number of former senior Obama administration officials endorsed the Trump administration's supplements to the U.S. nuclear modernization program.[12] The first supplemental program the Trump administration proposed, the W76-2 low-yield warhead, was small in scope and modified only a "small number" of warheads.[13] The second supplemental program, the SLCM, was re-introducing a capability that the United States had previously, thus not a radical departure from previous policy.

In summary, it is clear that the Biden administration is inheriting a nuclear modernization program, 90% of which began under the Obama administration—and the other 10% which began under the Trump administration has the support of multiple former senior Obama administration officials. Again, it is far from clear that the Biden administration—even if

[11] For examples of such defenses, see the testimony from Panel II, U.S. Senate Energy and Water Development Subcommittee Hearing, Senate Appropriations Committee, "Hearing to Review Budget Requirements & Justification for the Nuclear Cruise Missile," July 13, 2016, available at https://www.appropriations.senate.gov/hearings/hearing-to-review-budget-requirements-and-justification-for-the-nuclear-cruise-missile.

[12] See especially, Sandy Winnefeld and James N. Miller, "Bring Back the Nuclear Tomahawks," *Proceedings*, Vol. 143, No. 5 (May 2017), available at https://www.usni.org/magazines/proceedings/2017/may/bring-back-nuclear-tomahawks; and, John R. Harvey, Franklin C. Miller, Keith B. Payne, and Brad R. Roberts, "Continuity and Change in U.S. Nuclear Policy," *Real Clear Defense*, February 7, 2018, available at https://www.realcleardefense.com/articles/2018/02/07/continuity_and_change_in_us_nuclear_policy_113025.html.

[13] John Rood, "Statement on the Fielding of the W76-2 Low-Yield Submarine Launched Ballistic Missile Warhead," *Defense.gov*, February 4, 2020, available at https://www.defense.gov/Newsroom/Releases/Release/Article/2073532/statement-on-the-fielding-of-the-w76-2-low-yield-submarine-launched-ballistic-m/.

ideological allies with the Obama administration—will adopt and sustain the current U.S. nuclear modernization program, but if it does, it will sit firmly within the mainstream of past nuclear policies.

U.S. Nuclear Declaratory Policy

Finally, it is useful to comment on the nuclear weapon policy positions that the Obama administration ended on, since those positions affected its views on the number and type and status of nuclear weapons it believed the United States needed, and the Biden administration may find it a useful starting point for its own thinking on the topic.

On declaratory policy, the Obama administration reportedly examined adopting a nuclear "no first use" or "sole purpose" policy in 2016, but ultimately chose not to. According to media reports, multiple U.S. allies including the United Kingdom, France, South Korea, and Japan contacted the Obama administration to express their opposition to a U.S. adoption of a "no first use" policy.[14] And, according to one former senior Obama administration official, this allied opposition included a call from Japanese Prime Minister Abe's office itself.[15] In addition, other former senior Obama administration defense officials do not currently favor adopting a "no first use" policy.[16]

Where to From Here?

While defense commentators regularly play Washington D.C.'s favorite game—extrapolating who gets which policy position as an indicator for future defense policies—it is useful to remember the famous Harry Rowen quote, "The Pentagon is like a log going down the river with 25,000 ants on it, each thinking he's steering the log." That is to say, external events have just as much say as internal policy on shaping U.S. nuclear policy as evidenced by the Russo-Ukrainian conflict in 2014 and the Soviet-Afghan conflict in 1979. Both the Obama and Carter administration, respectively, entered office with plans for de-emphasizing nuclear weapons in U.S. nuclear policy, but outside events convinced many executive and defense

[14] See Paul Sonne, Gordon Lubold, and Carol E. Lee, "'No First Use' Nuclear Policy Proposal Assailed by U.S. Cabinet Officials, Allies," *The Wall Street Journal*, August 12, 2016, available at https://www.wsj.com/articles/no-first-use-nuclear-policyproposal-assailed-by-u-s-cabinet-officials-allies-1471042014; and, Josh Rogin, "Obama Plans Major Nuclear Policy Changes in Final Months," *The Washington Post*, July 10, 2016, available at https://www.washingtonpost.com/opinions/global-opinions/obama-plans-major-nuclear-policy-changes-in-his-final-months/2016/07/10/fef3d5ca-4521-11e6-88d0-6adee48be8bc_story.html.

[15] Tomoko Kurokawa, "Determinants of the Nuclear Policy Options in the Obama Administration: An Interview with Jon Wolfsthal," *Journal for Peace and Nuclear Disarmament*, Vol. 1, No. 2 (2018), p. 503.

[16] See especially, Brad Roberts, "Debating Nuclear No-First Use, Again," *Survival*, Vol. 61, No. 3 (2019), pp. 39-56; James N. Miller, "No to No First Use – For Now," *Bulletin of the Atomic Scientists*, Vol. 76, No. 1 (2020), pp. 8-13; and John R. Harvey, "Assessing the Risks of a Nuclear 'No First Use' Policy," *War on the Rocks*, July 5, 2019, available at https://warontherocks.com/2019/07/assessing-the-risks-of-a-nuclear-no-first-use-policy/.

officials that modernizing the U.S. nuclear arsenal was a prudent response to external threats.

Given this possibility, if not likelihood, that unforeseen external events will shape the Biden administration's nuclear policies, where can we reasonably expect U.S. nuclear policy to go in 2021 and beyond?

The Biden team will likely face pressure from the more progressive side of the Democratic Party to issue a "no first use" pledge and perhaps make unilateral cuts to the U.S. nuclear force.[17] These ideas and others are manifest in documents like the "Alternative Nuclear Posture Review," published by the organization Global Zero, and authored in part by the late Bruce G. Blair.[18] Reports such as these are out of the mainstream of U.S. nuclear policy as is clear from previous Republican and Democratic administrations, and Congresses, going back into the Cold War—nevertheless, they represent a vocal minority.

On the other hand, there is another faction of the Democrat Party, in my estimation a plurality, that is familiar with nuclear weapon issues and more or less content with the current U.S. nuclear modernization program and will likely follow President Biden's lead if his administration supports it. For example, Senator Tester of Montana, a firm supporter of nuclear modernization, was recently named to be the Chairman of the powerful Senate Defense Appropriations subcommittee.

The final faction of the Democratic party are those members who are not well versed in nuclear weapon issues and can be persuaded one way or the other, and its these members that most independent think tanks and activist groups are trying to reach. For instance, the most recent report by George Perkovich and Pranay Vaddi "Proportionate Deterrence: A Model Nuclear Posture Review," seems aimed at the persuadable middle who may be wary of radical changes to U.S. nuclear policy and posture yet are inclined to make a minor or token changes to signal their commitment to long-term nuclear disarmament.[19]

Which faction wins out, what events influence everyone, and what unforeseen "X factor" enters the debate remains to be seen, but it appears the Biden administration will face a threat environment that is not much better, and may be worse, than that which faced the

[17] See, for example, a letter signed by Senators Markey, Feinstein, Franken, Boxer, Merkley, Sanders, Warren, Brown, Leahy, and Wyden to then-President Obama, July 20, 2016, which advocated for a "no first use" policy and cancelling the LRSO. Available at https://www.markey.senate.gov/imo/media/doc/7-20-16%20EJM%20Letter%20to%20President%20Obama%20on%20Nuclear%20Weapons.pdf.

[18] Bruce G. Blair, with Jessica Sleight and Emma Claire Foley, *The End of Nuclear Warfighting: Moving to a Deterrence-Only Posture* (Washington, D.C.: Global Zero, September 2018), available at https://www.globalzero.org/wp-content/uploads/2019/02/ANPR-Final.pdf.

[19] George Perkovich and Pranay Vaddi, *Proportionate Deterrence: A Model Nuclear Posture Review* (Washington, D.C.: Carnegie Endowment for International Peace, 2021), available at https://carnegieendowment.org/files/Perkovich_Vaddi_NPR_full1.pdf.

Obama administration—making the possible argument that international conditions now allow for a change in policy, like adopting a "no first use" policy, or a change in posture, such as eliminating LRSO, a much more difficult case to make. In addition, the Biden administration's early focus on assuring U.S. allies and partners—who also face an increasingly dangerous threat environment –complicates any potential major change in policy or posture, as allies and partners have reportedly lobbied vigorously against such changes in the past.

The one long term trend to watch, however, is the increasing cost of the U.S. nuclear modernization—a cost that was anticipated long ago but is now becoming a greater reality as programs move from paper studies to beginning to production. The costs of nuclear modernization should never be explained in a vacuum, however, as many of those who favor disarmament tend to do—citing the figure that it may cost upwards of $1 trillion dollars to modernize the U.S. nuclear triad, while neglecting to mention that that cost is spread over 30 years, the much lower cost of nuclear weapons compared to conventional weapons in the overall defense budget, the value of nuclear weapons that last until the 2070s and 2080s in a dynamic threat environment, etc.

As always, the money that the Biden administration proposes to Congress for funding the U.S. nuclear modernization program in its budget will speak louder than any speech or rhetoric as to its true intentions. Historically, U.S. nuclear policy is not prone to radical departures from previous policies—usually the changes that do occur are more evolutionary than revolutionary. This dynamic has served the United States well in the past, and now the Biden administration must consider whether it should continue to do so in the future.

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Robert Soofer
Robert Soofer is former Deputy Assistant Secretary of Defense for Nuclear and Missile Defense Policy.

No discussion of nuclear modernization is complete without a look at the relationship between arms control and modernization. Are they compatible? Are they at odds? Can you have one without the other? This presentation begins with a broad discussion of the range of views, then narrows to some specific caveats and recommendations for an approach incorporating both arms control and nuclear modernization.

Three Views

There are a range of views regarding the relationship between arms control and nuclear modernization. At the risk of some oversimplification, we can group these views into three categories: Disarmers, Arms Control Cynics, and Deterrence Realists.

The **Disarmer** believes nuclear modernization is the antithesis of arms control. Modernizing nuclear forces demonstrates a lack of good faith in negotiations; it is a waste of money; stokes the arms race; and is contrary to the goal of disarmament. This view discounts the leverage of warm production lines because it assumes the parties are already self-interested in reducing arsenals—no leverage is needed. Most important, this view holds that refraining from nuclear modernization is necessary in order to set a disarmament example for other states to follow, which is a prerequisite for arms control and nuclear disarmament.

The main critique of this view is that it ignores reality: Russia, China, North Korea and other nuclear states have been expanding their nuclear capabilities despite U.S. restraint. As former Obama defense secretary Ashton Carter observes, "During the past 25 years, the United States has made no major new investments in its nuclear forces, yet other countries have conducted vigorous buildups. This history does not support the contention that U.S. investments fuel the nuclear programs of others."[20]

The **Arms Control Cynic** is at the other end of the spectrum. The central tenets of this approach are that the United States should not rely on arms control for its security; that arms control becomes a substitute for making the hard and difficult decisions to modernize our aging nuclear forces; and that arms control treaties constrain U.S. freedom of action in dealing with the growing Russian and Chinese dangers. This view remains worried that ever lower numbers of nuclear forces pose dangers for a survivable U.S. nuclear deterrent and messages to allies that we are less likely to extend the nuclear umbrella on their behalf.

The critique of this approach is that it ignores the difficulty of gaining support for a build-up of U.S. nuclear forces in absence of arms control, especially in the post-cold war era. It assumes the President and Congress will take advantage of the freedom of action granted by the lack of arms control treaty restraints. History, again, suggests otherwise. Just look at the difficulty the Trump administration had in deploying the low yield SLBM warhead and in pursuing a new nuclear sea-launched cruise missile—both of which had no New START treaty or arms control implications.

Congress is unlikely to support new nuclear programs in the absence of arms control. Speaking to Trump Administration witnesses, Senator Menendez, the Democratic Chairman of the Senate Foreign Relations Committee, had this to say: "I also want to remind the administration that bipartisan support for nuclear modernization is tied to maintaining an arms control process that controls and seeks to reduce Russian nuclear forces, which inevitably means promoting military- and fiscally-responsible policies on ourselves. We are not interested in writing blank checks for a nuclear arms race with Russia. And we don't

[20] Ash Carter, "Evaluating the Nuclear Posture Review," Harvard Kennedy School Belfer Center Newsletter, Spring 2018, p. 5, available at https://www.belfercenter.org/sites/default/files/files/publication/Spring%202018%20Newsletter.pdf.

want to step off our current path of stability to wander again down an uncertain road filled with potentially dire consequences."[21]

Likewise, Brian McKeon, a senior advisor the President Biden and understood to be nominated for Deputy Secretary of State, observed that, "Supporters of arms control will surely be reluctant to buy into a long-term modernization plan that does not involve a realistic plan for mutual restraint between the two countries with the largest nuclear arsenals."[22]

Finally, we come to the **Deterrence Realists**. This camp understands nuclear deterrence and arms control to be twin pillars in the nation's approach to deterring nuclear dangers and reducing nuclear threats. This has been the traditional approach of the United States since the dawn of the nuclear age.

For example, even while the Eisenhower administration was building the U.S. nuclear arsenal from 1,000 to 20,000 weapons it was pursuing the Atoms for Peace initiative and the precursory to the Open Skies Treaty; the Nixon Administration began development of the MX ICBM, the Trident SLBM and the B-1 bomber even while it concluded the ABM Treaty and the SALT Agreement; the Clinton Administration was known for its "lead but hedge" policy—lead in nuclear reductions but hedge against an uncertain future; the George W. Bush Administration pulled out of the ABM Treaty, yet achieved a two-thirds reduction in deployed nuclear weapons under the Moscow Treaty; President Obama negotiated the New START treaty, yet provided a commitment to modernize each leg of the nuclear triad; and finally, the Trump Administration continued implementation of the triad modernization—proposing the addition of a nuclear sea-launched cruise missile—yet also pursued trilateral nuclear arms control with Russia and China.

The Deterrence Realist also appreciates the **political nature of arms control**, both in its domestic and international aspect. The U.S. must be seen to have a viable alternative to the disarmament narrative. The deterrence realist hopes that the really harmful effects of arms control may be limited through effective negotiation, mutual and balanced reductions, and verification and enforcement of agreements. Most important, the Deterrence Realist understands that at lower numbers of nuclear weapons, the remaining force must be, without a doubt, survivable, ready, sufficiently diverse in delivery systems and yields to

[21] Opening statement of Sen. Robert Menendez in "Status of U.S.-Russia Arms Control Efforts," *Hearing Before the Committee on Foreign Relations, United States Senate, One Hundred Fifteenth Congress, Second Session*, September 18, 2018, p.4, available at https://www.foreign.senate.gov/imo/media/doc/09%2018%2018%20Status%20of%20US%20Russia%20Arms%20Control%20Efforts.pdf.

[22] Brian McKeon, "Recalling the Senate Review of New START," *Arms Control Today*, Vol. 49, October 2019, available at https://www.armscontrol.org/act/2019-10/features/recalling-senate-review-new-start.

provide the U.S. president the flexibility with which to tailor deterrence in a wide range of circumstances, and to hedge technical and geopolitical uncertainty.

The Early Biden Approach

We must wait to see which of these approaches will be adopted by the new administration. No doubt, there will be tension between the disarmers and the deterrence realists, just as there was in the Obama Administration.

Early signs are encouraging. It may have been a mistake to extend the New START treaty fully for five years; an incremental extension, which the Russians were open to, would have provided leverage to pursue the next round of negotiations.

Yet, in announcing the President's decision to extend the New START Treaty by five years, Secretary of State Blinken noted that: "The New START Treaty is only the beginning of efforts to address 21st century challenges; the "U.S. will use the time provided by a five year extension of the New START treaty to pursue with the Russian Federation, in consultation with Congress and partners, arms control that addresses all of its nuclear weapons"; "we will also pursue arms control to reduce the dangers from China's modern and growing nuclear arsenal"; and "we remain clear eyed about the challenges that Russia poses to the United States and the world."

Pursuing all Russian nuclear weapons as well as arms control to address the nuclear dangers posed by China builds on the Trump administration approach, aligns with the traditional deterrence realist approach, and should receive bipartisan support.

Five Caveats

First, U.S. and allied security will depend not on any particular treaty, but on whether nuclear modernization proceeds over the next decade and whether we maintain survivable and flexible nuclear forces with a range of delivery systems and yields. This must be the organizing principle. All other considerations are subordinate to doing what it takes to maintain common ground on nuclear modernization and maintaining forward based nuclear weapons. This entails support for arms control.

Second, a less obvious danger to the future of U.S. and allied nuclear deterrence capability is the international nuclear ban movement, codified in the Ban Treaty that has recently been ratified by 50 nations. Fortunately, our NATO and Asian allies have not supported the treaty, but there will be pressures to do so. There was a close scare in Belgium last year.

Recall that politics is local. If politicians don't have an alternative to the ban treaty, then they could lose their local elections. This could oblige them to support the ban movement when

otherwise they understand the importance of nuclear deterrence. This is problematic. If one NATO country joins the ban treaty, this could trigger other parliaments in other countries to do the same. To be sure, this would have a more profound negative effect on nuclear deterrence than any shortcomings of the New START treaty. Arms control poses a solution, and alternative to the Ban Treaty. In this way, it supports nuclear modernization and nuclear alliances.

Third, if and when we pursue arms control negotiations with Russia, we must avoid the danger of agreeing only to further strategic force reductions just because they are easier to achieve in a New START follow on agreement. We must address the disparity in Russian and U.S. non-strategic nuclear forces. This notion should not be in dispute, yet there are voices in the disarmament community calling for lower New START force levels as an initial step.

As a reminder, Henry Kissinger noted in his 2010 congressional testimony that New START is "probably the last agreement on strategic arms that can be made without taking tactical nuclear weapons into account. It is also approaching the end of what can be achieved by bilateral negotiations on the subject between the U.S. and Russia. Growing arsenals and proliferation will soon impose a multilateral context."[23] To which SFRC Chairman Senator John Kerry replied, "With respect to the tactical nuclear weapons, there is, I think, a complete agreement in this committee and in the administration that that is the next step, that we cannot proceed further, in a sense."[24]

Fourth, disarmers need to understand that nuclear force modernization facilitates arms control, because at lower force levels, the survivability and readiness of the remaining force provides a hedge against changes in the strategic environment, adversary breakout, or cheating. As then Vice President Biden observed, investments in the nuclear weapons complex are "not only consistent with our nonproliferation agenda; they are essential to it. Guaranteeing our stockpile, coupled with broader research and development efforts, allows us to pursue deep nuclear reductions without compromising our security."[25]

Fifth, arms control without modernization will fail because the U.S. will have no leverage in negotiations. Warm production lines for ICBMs, LRSO, bombers and submarines provide an incentive for Russians to negotiate. Without such leverage and with a five-year extension to NST, the Russians have every incentive to maintain the status quo where the U.S. limits its

[23] Prepared statement of Henry Kissinger in "The New START Treaty," *Hearings Before the Committee on Foreign Relations, United States Senate, One Hundred Eleventh Congress, Second Session*, May 25, 2010, p. 170, available at https://www.foreign.senate.gov/imo/media/doc/042910_to_071510_Transcript_The%20New%20Start%20Treaty%20TD%20111%2053.pdf.

[24] Senator John Kerry in Ibid, p. 172.

[25] "Remarks of Vice President Biden at National Defense University-As Prepared for Delivery," February 18, 2010, available at https://obamawhitehouse.archives.gov/the-press-office/remarks-vice-president-biden-national-defense-university.

strategic forces and Russia continues to expand its non-strategic nuclear forces. Likewise, U.S. nuclear modernization and the potential to outpace China provides an incentive for China to come to the table. Eliminating a leg of the Triad makes it easier for China to contemplate parity with the U.S. and Russia. If arms control with China fails, then nuclear modernization will be all the more important as China grows its nuclear forces.

Conclusion

The failure to follow-through with the Obama-Trump nuclear modernization plan could have the following negative consequences:

- The nuclear balance of forces will continue to deteriorate as Russia and China expand their nuclear arsenals.
- The disparity between the U.S. and Russia/China will call into question the credibility of U.S. nuclear assurances, leading to less coherent alliances and perhaps prompting nuclear proliferation by our allies. Failure to modernize will message allies that the U.S. is more interested in disarmament than deterrence.
- U.S. nuclear arms control negotiators will have little leverage, while the lack of U.S. nuclear arms control initiatives will bolster the nuclear ban movement.
- Reneging on President Obama's commitment to Congress to modernize each leg of the nuclear triad in return for the Senate's advice and consent to ratify New START will unnecessarily strain relations between Republicans in Congress and the President. This will undermine the prospects for arms control and other means for reducing nuclear dangers.

LITERATURE REVIEW

William A. Chambers, Caroline R. Milne, Rhiannon T. Hutton, and Heather W. Williams, *No-First Use of Nuclear Weapons: A Policy Assessment* (Alexandria, VA: Institute for Defense Analyses, January 2021), 84 pp.

As the debate over U.S. nuclear weapons policy heats up and the Biden Administration begins its eagerly awaited review of U.S. nuclear posture, the issue of whether to adopt a "no first use" (NFU) nuclear policy is again emerging as a key point of contention. In this expert study by the Institute for Defense Analyses (IDA), the authors address the implications of changing U.S. declaratory policy from the longstanding and bipartisan support for "calculated ambiguity" to an NFU policy, and the pitfalls of declaring that the United States will not—under any circumstances—be the first to employ nuclear weapons.

This study—which was done in response to a congressional mandate in the Fiscal Year 2020 National Defense Authorization Act—assesses the impact of NFU on U.S. force posture, allied perceptions of U.S. credibility, adversary reactions, and nuclear nonproliferation goals and objectives. It concludes that "U.S. adoption of an NFU policy will not bring about a setting that is more conducive to positive behavior by adversaries or to strengthened relations with allies. In light of already-constrained U.S. policy and procedure governing nuclear use, the weight of the evidence indicates *significant potential for NFU to impart more harm than good"* (emphasis in original).

IDA's assessment is a clear-eyed and intellectually robust analysis that is refreshingly devoid of partisan political posturing—a trait that is increasingly common in the contemporary debate over nuclear weapons and strategy. While the authors note the "speculative" nature of determining the impact of an NFU policy on overall U.S. force posture, they highlight the fact that allies continue to view U.S. security guarantees as critical and conclude that adoption by the United States of an NFU policy would "dilute" the credibility of U.S. assurances. Further, they state that "NFU will not favorably alter adversary behavior nor affect the risk of miscalculation." Indeed, they argue that the risk of adversary miscalculation in a period of crisis "will not be lowered" by U.S. adoption of NFU.

Importantly, the study concludes that a U.S. NFU policy would have little to no effect on the proliferation behavior of other states. It makes the commonsense observation that "Nation-states make decisions about their security needs based less on U.S. policy and more on their own interests." This fundamental truth is often lost on those who see the United States as the driver of an action-reaction phenomenon and who argue that if only the United States would lead, others would willingly follow. Such an idealist view of international behavior is not borne out by the historical record.

No-First Use of Nuclear Weapons: A Policy Assessment is a readable and well-articulated analysis of a complex and controversial national security issue. The analysts at IDA should be commended for preparing such a useful and relevant document to inform the contemporary nuclear debate. Hopefully, the Biden Administration will review its conclusions with the seriousness and attention they deserve when considering whether and how to adapt U.S. nuclear policy to the full range of existing and prospective threats facing the United States and its allies.

Reviewed by David J. Trachtenberg
National Institute for Public Policy

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Daniel P. Bagge, *Unmasking Maskirovka: Russia's Cyber Influence Operations* (New York, NY: Defense Press, 2019), 251 pp.

From election hacking to threatening U.S. allies, the Russian Federation appears to be back at the forefront of policymakers' interests. Bagge's book illuminates how the Russian government thinks about and executes influence operations and how it utilizes new technologies to make this ever so traditional tool of statecraft more potent than ever.

To understand Russia's influence operations, Bagge introduces the concept of "reflexive control." The purpose of reflexive control is to model, understand, and disrupt the opponent's decision-making processes. Wars are to be waged not only between respective militaries, but between their decision-making processes even before forces clash. The concept was born out of the Soviet Union's realization that it was inferior to the United States in economic and technological fields starting in the 1950s and 1960s and its subsequent efforts to level the playing field via less expensive means. Influence operations are a critical component of "reflexive control" because they seek to alter a target's perception of reality and shape his decision-making processes in ways beneficial to the Russian Federation.

Bagge lists four prerequisites for "reflective control": manipulation of the target's sensory awareness; hiding one's true intentions; influencing the target's information resources; and tampering with filters (data processors) and sensory awareness (images of the outside world). The campaign to change the target's perceptions is long-term. The goal of feeding an adversary deceptive or distorted information is to impact his moral values, psychological state, or even his character so that he would make decisions beneficial to the Russian Federation without being cognizant of it.

While the technique could not quite reach its full potential during the Cold War due to limits in information distribution, modern technologies are perfectly suited for the kind of manipulation that has the potential to change the target's calculus and change his decisions.

Even though deception as a tool of statecraft is not new, the spread of modern technologies and their accessibility allows for a significant qualitative (and quantitative) difference from past practices. To drive the point home, Bagge documents in detail influence operations that Russia conducted concurrent with its invasion of Ukraine. Ukraine was likely made more vulnerable to Russia's attacks because of its pre-war cooperation with Russia in this area, which allowed Russia to understand Ukraine's information systems and networks. But pro-Russian hacker attacks, conceivably with support of the Russian government, were not limited to Ukraine but targeted other countries too, including the United States and its allies. For example, hackers released U.S. diplomats' and an Estonian minister's communications relevant to Russia's attack on Ukraine; attacked governments' computers with spyware and malware; hacked U.S.-made UAVs in Ukraine; and stole satellite imagery of the battlefield from a Ukrainian general's emails.

Another beneficial aspect of the book that is relevant for policymakers is its explanation of where cyber-conducted influence operations fit into Russia's military and strategic doctrine. The short answer is everywhere—unlike in the United States where the traditional focus is on protecting the infrastructure and developing hardware capabilities. And unlike the United States, the Russian Federation's strategic documents make clear that Moscow does not distinguish between peacetime and wartime; its operations against the West are ongoing. Russia sees this convergence between military and non-military means as desirable and exploitation worthy. In other words, we are at war against Russia regardless of our own desirefor peace.

What is the best way to counter Russia's malicious activities? As Bagge states, "The critical component of any recommendation is [...] the individual. Individuals are the common denominator of the processes and decision-making, and are the ultimate targets of information-psychological and, in case the aim is not the infrastructure itself, information-technical attacks. If the individual is resilient, then the activities he participates in are resilient, be it analysis, information processing or decision-making." The book is somewhat short on concrete actionable policy recommendations, but that can be forgiven because in its stated purpose--to make individuals aware and cognizant of how the Russian government approaches influence operations--the book succeeds admirably.

Reviewed by Michaela Dodge
National Institute for Public Policy

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George Perkovich and Pranay Vaddi, *Proportionate Deterrence: A Model Nuclear Posture Review* (Washington, D.C.: Carnegie Endowment for International Peace, 2021), 144 pages.

As the Biden administration begins its process of writing policy guidance documents, perhaps including a new *Nuclear Posture Review*, it will no doubt conduct a review of the non-government literature that is friendly to its inclinations, and – one would hope – the literature that challenges its assumptions. Among the officials the Biden administration has appointed to serve in the Pentagon, the State Department, the National Security Council, and other offices with responsibilities in crafting a new *Nuclear Posture Review*, there appears to be a mix of those who wish to make relatively minor changes to the policies, priorities, and programs from the 2018 *Nuclear Posture Review*, call them "reformers;" and then there are those who appear more willing to consider radical changes in U.S. nuclear policy and posture, call them "revolutionaries." During the Obama administration, much to the revolutionaries' dismay, the reformers ultimately carried the day on most issues – but it is far too early to predict the outcome of the Biden administration's process.

The new report by Perkovich and Vaddi (now a Senior Adviser at the State Department) reads as though they are "reluctant reformers," who would ideally like to see broader changes to U.S. nuclear policy and programs, but who recognize the political obstacles and the negative shift in the threat environment as making those changes either unwise or too unlikely to succeed, and thus not worth pursuing.

Supporters of the 2018 *Nuclear Posture Review* will find areas of disagreement with the authors, but it will generally be thoughtful disagreement as Perkovich and Vaddi anticipate counterarguments – a practice sorely missing from other non-government reports on the subject. For example, their support of a change in U.S. nuclear declaratory policy to an "existential threat policy" is ultimately unpersuasive to this reviewer because of the potential speed and ambiguity in identifying when a threat transitions from "severe" to "existential;" but the "existential threat policy" is a novel suggestion that recognizes the flaws in "sole purpose" and "no first use" policies and at least deserves debate. Perkovich and Vaddi's discussion of the law of war and its implications for nuclear strategy also usefully contributes to the debate, although this reviewer found their conclusion regarding the U.S. duty under international law to reduce the role of nuclear weapons in its strategy to be several steps too far.

Perkovich and Vaddi spend a significant portion of the report summarizing the U.S. need to modernize its nuclear command, control, and communication (NC3) systems – a point on which most everyone will nod in unison. More controversially, however, they recommend canceling the nuclear-armed sea-launched cruise missile proposed in the 2018 NPR and pausing the development of the replacement intercontinental ballistic missile for Minuteman III, the Ground-Based Strategic Deterrent – opting instead for life-extending Minuteman III.

Regrettably, the authors do not discuss the arms control implications of life-extending an already 50-year-old missile system, while Russia and China – which base the majority of their warheads on ICBMs – are investing heavily in building new ICBMs. On arms control, Perkovich and Vaddi are open to some limits on U.S. missile defenses while pursuing parallel efforts with Russia and China to reduce and cap their arsenals respectively.

Many of the authors' recommendations stem from their desire to reduce the role of nuclear weapons in U.S. defense policy and decrease the chances for misperception and miscalculation. While they should be commended for including a section on the threat environment in their report – again, a rarity in reports by those who generally support U.S. nuclear reductions – the section lacks much substantive discussion of chemical, biological, or non-strategic nuclear threats. This relative silence is especially concerning given the geographic position of U.S. allies neighboring multiple states with these capabilities and a revisionist mindset.

Perkovich and Vaddi appear to have let their desire to reduce the role of nuclear weapons in U.S. strategy override their concerns for the threat environment by insisting that fewer U.S. nuclear weapons within a more narrowly restricted role in U.S. defense strategy will make the United States and its allies safer. Were that the United States blessed with such compliant potential adversaries, but, after all, China and Russia "get a vote" in whether the United States can choose to de-emphasize nuclear weapons in its defense strategy. One would think that the Chinese and Russian increased reliance on, and possession of an increasing number of, nuclear weapons would at least caution against any premature U.S. reduction in role or number of its nuclear weapons.

The Obama administration chose to reduce the role of nuclear weapons in U.S. defense strategy (in a very different threat environment) by increasing the number and quality of regional missile defenses and conventional strike capabilities – options given relatively short shrift in *Proportionate Deterrence* in favor of reducing nuclear capabilities. The authors' recommendation in this regard for merely life-extending Minuteman III ICBMs appears especially questionable when six months after the report's publication U.S. media began reporting multiple public discoveries of hundreds of new Chinese ICBM silos. One wonders what Chinese and Russian defense officials think of U.S. nuclear deterrence when they see a raging U.S. debate about whether a 50 year-old ICBM should be life-extended, and possibly phased out. Disproportionate indeed.

Although not emphasized in their report, Perkovich and Vaddi would have benefited from a more objective look at the debate surrounding U.S. homeland missile defense. They take for granted the vintage Cold War belief that the "action-reaction" dynamic is at play in U.S. homeland missile defense and lightly rebuke missile defense proponents for not recognizing the, supposedly, obvious connection. But turnabout is fair play, and Perkovich and Vaddi do not consider the myriad of other factors, beyond a mechanistic action-reaction cycle

supposedly led by the United States, of why Russia and China have built the forces they have, including: hedging against each other, expressions of great power capabilities, strategies of coercion, and the creation of jobs in the military industrial centers of power. Once the action-reaction myth is busted, their recommendation about exploring trades in U.S. missile defense for arms control progress appears short-sighted.

In *Proportionate Deterrence*, Perkovich and Vaddi explain their views on nuclear employment, nuclear and missile defense systems, arms control, and a number of other topics – a span of subjects appropriate for any top-level view of the role of nuclear weapons in U.S. defense strategy. If readers are looking for a general overview of the issues the Biden administration will likely confront in writing their NPR, especially from the left-of-center perspective, then *Proportionate Deterrence* will be instructive. Should the Biden administration accept each of the conclusions in the report, however, it would lead to substantial breaks with bipartisan precedent in previous Nuclear Posture Reviews – indicating to this reviewer that U.S. officials should look beyond *Proportionate Deterrence*.

Reviewed by Matthew R. Costlow
National Institute for Public Policy

Document No. 1. Report on the Nuclear Employment Strategy of the United States – 2020 (Specified in Section 491(a) of Title 10 U.S.C.)

Purpose

This report on the Nuclear Employment Strategy of the United States is submitted in accordance with section 491(a) of title 10, U.S. Code, which states:

> By not later than 60 days before the date on which the President implements a nuclear employment strategy of the United States that differs from the nuclear employment strategy of the United States then in force, the President shall submit to Congress a report setting forth the following:
>
> (1) A description of the modifications to the nuclear employment strategy, plans, and options of the United States made by the strategy so issued.
> (2) An assessment of effects of such modification for the nuclear posture of the United States.
> (3) The implication of such changes on the flexibility and resilience of the strategic forces of the United States and the ability of such forces to support the goals of the United States with respect to nuclear deterrence, extended deterrence, assurance, and defense.
> (4) The extent to which such modifications include an increased reliance on conventional or non-nuclear strike capabilities or missile defenses of the United States.

In April 2019, the President issued nuclear weapons employment guidance. This report is provided pursuant to section 491 as the Department of Defense (DoD) implements this new employment strategy by updating DoD military guidance and plans, a process that has been ongoing since 2019, and is scheduled to be completed in 2022.

Introduction

The President's April 2019 nuclear weapons employment guidance, as implemented by the Secretary of Defense's Nuclear Weapons Employment Planning and Posture Guidance, guides the planning for employment of nuclear weapons consistent with national policy. The revised Presidential and Secretary of Defense guidance reflects continuity with previous guidance, as it accounts for contemporary nuclear threats and great power competition. The guidance is intended to strengthen the security of the United States and its allies and partners through the development of tailored nuclear deterrence strategies supported by flexible capabilities.

The requirements for effective nuclear deterrence vary given the need to address different potential adversaries under very different circumstances. Deterrence rests on a perceived

ability to deny an adversary the objectives it seeks from an attack and the capability to inflict intolerable costs under any circumstances. However, the United States cannot rely on adversaries to perceive threats of large-scale nuclear responses as credible in all situations. Therefore, to strengthen the credibility of U.S. nuclear deterrence and extended deterrence, the United States will continue to field a range of nuclear and non-nuclear capabilities that provide U.S. leadership with options that can be tailored to deter potential adversaries, assure allies and partners, achieve U.S. objectives should deterrence fail, and hedge against an uncertain future.

If deterrence fails, the United States will strive to end any conflict at the lowest level of damage possible and on the best achievable terms for the United States, and its allies, and partners. One of the means of achieving this is to respond in a manner intended to restore deterrence. To this end, elements of U.S. nuclear forces are intended to provide limited, flexible, and graduated response options. Such options demonstrate the resolve, and the restraint, necessary for changing an adversary's decision calculus regarding further escalation.

2018 Nuclear Posture Review

In 2017, President Trump directed the Secretary of Defense to initiate a new Nuclear Posture Review (NPR). DoD completed the NPR in 2018 and has since been implementing it. The purpose of the 2018 NPR was to reassess U.S. security requirements in the new strategic environment that had developed since the 2010 NPR was published.

The 2018 NPR identifies four key roles that nuclear weapons play 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,
- Capacity to hedge against an uncertain future.

In implementing the 2018 NPR, the DoD, the Department of Energy (DOE) and the Department of State (State) are focused on ensuring that U.S. nuclear forces can fulfill these roles, both today and in the future.

Deterrence Strategy

The 2018 NPR articulated a U.S. nuclear deterrence strategy consistent with previous deterrence strategies, adjusted to account for developments in the threat environment since the 2010 NPR. These developments include increased prominence of nuclear weapons in the

military strategies of Russia, China, and rogue States to secure coercive and military advantage against the United States, and its allies, and partners.

The Strategic Environment

Changes in the strategic environment since the publication of the 2010 NPR demonstrate that nuclear-armed potential adversaries chose not to follow the U.S. lead in reducing the role of nuclear weapons in their national security strategies. They have instead chosen to emphasize the role of nuclear weapons and, for more than a decade, they have increased the size of their nuclear arsenals, modernized their existing capabilities, and created and fielded new capabilities.

The increasing prominence of nuclear weapons in the national security strategies of potential adversaries is taking place in a strategic environment that, since 2010, has become significantly more threatening and less stable. Russia, China, North Korea, and Iran all have undertaken aggressive actions to expand or reinforce their influence. Of particular concern are aggressive Russian and Chinese actions (e.g. Russian occupation of Crimea, military intervention in eastern Ukraine, and violation of the Intermediate Range Nuclear Forces (INF) Treaty; Chinese militarization of the South China Sea, renewed assertiveness vis-à-vis Taiwan, and border conflict with India).

Rather than reducing the role of nuclear weapons, Russia and China are developing, testing, and procuring nuclear weapons and delivery systems to support their efforts to upset the international order, including claiming disputed territories and forcefully occupying neighboring lands. Russia, for instance, is expected to grow the size and increase the capabilities of its nuclear arsenal significantly over the next decade. This growth is driven primarily by Russia modernizing and expanding its non-strategic nuclear weapons – providing them greater accuracy, longer ranges, and lower yields to suit their role in coercive nuclear strategies and nuclear warfighting. In addition, Russia is pursuing a number of novel nuclear delivery systems of strategic range that are not covered under the New START Treaty and have no U.S. counterpart.

China, meanwhile, continues its policy of non-transparency regarding its nuclear arsenal and doctrine, and is likely to at least double the size of its nuclear stockpile by 2030. It may not stop there. Its activities in Asia have caused considerable alarm among U.S. allies and partners. Despite a global economic downturn, China continues to increase its defense spending and one of its top priorities is modernizing and significantly expanding its nuclear forces. China will soon field a full triad of delivery systems (land-, air-, and sea-based) that can range U.S. regional allies and partners, and the U.S. homeland. The United States has significant questions and concerns regarding the evolution of Chinese nuclear doctrine, especially regarding its “No First Use” policy, as well as the rapid expansion of its nuclear

arsenal and its exploration of low-yield nuclear warheads. China's policy of opacity and consistent refusal to engage in serious dialogue concerning nuclear matters, nuclear risk reduction, and arms control increases the dangers and potential consequences of misperception and miscalculation in crisis or conflict.

The rogue states of North Korea and Iran continue to pose a security threat to the United States and its allies and partners. Although the United States still aspires to a negotiated elimination of North Korea's nuclear arsenal, North Korea continues to expand and advance its nuclear capabilities. The United States is carefully monitoring North Korea's missile development, nuclear advances, and proliferation activities. In addition, Iran is gaining valuable knowledge with its space-launch program that could be applied towards developing an intercontinental ballistic missile (ICBM). Iran's non-compliance with its nuclear non-proliferation obligations under the Joint Comprehensive Plan of Action (JCPOA) is especially troubling.

Although the United States aspires to a cooperative international order that allows for nuclear disarmament, these international security developments, when combined with the unpredictable nature of future threat developments and aging U.S. nuclear systems, demonstrate the prudence and necessity of the U.S. nuclear modernization program. Since international affairs can alter deterrence and assurance requirements faster than the U.S. defense industrial base can reasonably be expected to respond to shifting requirements, it is of paramount importance that U.S. nuclear forces; the nuclear command, control, and communication systems (NC3); and stockpile infrastructure be flexible, responsive, and resilient.

Until nuclear weapons can be prudently eliminated from the world, the United States will maintain safe, secure, and effective nuclear forces that deter potential adversaries, assure allies and partners, enable us to achieve our objectives if deterrence fails, and hedge against future uncertainties.

Nuclear weapons alone, no matter how capable, however, cannot have the necessary deterrence and assurance effects without a realistic and credible supporting strategy, tailored to potential adversaries.

Tailored Strategies and Flexible Capabilities

Through the Cold War and the years immediately thereafter, the United States was able to focus its nuclear weapons policy, strategy, and force development on the Union of Soviet Socialist Republics (USSR) and later the Russian Federation. However, the post-Cold War strategic environment became more complex as Russia began modernizing and expanding its nuclear capabilities; China declared their aspirations to "basically" complete military

modernization by 2035 and become a "world class" military by 2049 – armed with a nuclear triad and a global fighting force; and North Korea pursued and acquired a nuclear capability. As a result, tailored deterrence strategies – unique to each potential adversary – are now necessary to reduce the chance of misperception while clearly and credibly communicating U.S. intentions and capabilities.

The 2018 NPR states: "The requirements for effective deterrence vary given the need to address the unique perceptions, goals, interests, strengths, strategies, and vulnerabilities of different potential adversaries. The deterrence strategy effective against one potential adversary may not deter another. Consequently, the United States will apply a tailored approach to effectively deter across a spectrum of adversaries, threats, and contexts." In short, U.S. strategies and capabilities need to convey the costs of aggression to the right officials, at the right time, through the right communication channels, and in a credible and convincing manner.

The nuclear forces of the United States must be sufficiently flexible to deter a large spectrum of nuclear scenarios credibly, including an adversary's limited employment of nuclear weapons to secure advantage in a crisis or conflict. To meet these requirements, the United States will field nuclear and non-nuclear capabilities that provide U.S. leadership a range of tailored response options to deter escalation and accomplish U.S. objectives if deterrence fails. U.S. nuclear forces are designed, sized, and postured in such a way that no adversary should ever contemplate a successful disarming first strike or limited nuclear employment.

Elements of U.S. nuclear forces, currently in the field or under development, provide flexible, credible, limited, and graduated response options so U.S. leadership has choices beyond inaction or large-scale responses. Such options reduce the risk of a potential adversary's misperception of an exploitable gap between stated U.S. objectives and its perceived capabilities.

Limited and graduated U.S. response options provide a more credible deterrent to limited attack against the United States and our allies and partners than relying primarily on the threat of large-scale nuclear responses. Flexible and graduated options that raise an adversary's nuclear threshold have been a continuous part of U.S. deterrence strategy for decades. Such options do not increase risk and do not lower the U.S. nuclear threshold. Rather, such options, regarded as credible responses by potential adversaries, make their resort to nuclear weapons less likely, not more likely.

Capabilities designed to provide tailored, limited, and graduated response options do not work in isolation. Preserving large-scale response options further enhances deterrence by raising doubt in an adversary's mind of its ability to predict or control the consequences of a U.S. response to a nuclear or a non-nuclear strategic attack. A flexible nuclear force therefore

strengthens deterrence and reinforces the U.S. commitment to its allies and partners by demonstrating to adversaries there is no scenario for nuclear use to which the United States cannot respond effectively, and there exists no advantage an adversary could secure that would outweigh the costs of a U.S. nuclear response.

Declaratory Policy and Posture Guidance

Declaratory Policy

The 2018 NPR did not fundamentally alter the declaratory policy articulated in the 2010 NPR, but rather clarified it. The 2018 NPR states:

> The United States would only consider the employment of nuclear weapons in extreme circumstances to defend the vital interests of the United States, its allies, and partners. Extreme circumstances could include significant non-nuclear strategic attacks. Significant non-nuclear strategic attacks include, but are not limited to, attacks on the U.S., allied, or partner civilian population or infrastructure, and attacks on U.S. or allied nuclear forces, their command and control, or warning and attack assessment capabilities.
>
> The United States will not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the NPT and in compliance with their nuclear non-proliferation obligations.
>
> Given the potential of significant non-nuclear strategic attacks, the United States reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of non-nuclear strategic attack technologies and U.S. capabilities to counter that threat.

The President of the United States is the sole authority who can authorize the employment of nuclear weapons. DoD takes numerous steps to ensure U.S. nuclear forces are always under positive control and responsive to Presidential direction. DoD has established a number of means to provide senior leadership with the necessary information to support an informed decision regarding the employment of nuclear weapons. Any U.S. decision to employ nuclear weapons would follow a deliberative process.

Alert Levels

The day-to-day posture and alert levels of U.S. nuclear forces must ensure, and must be seen to ensure, that the United States has credible and effective response options available even in the wake of a large-scale nuclear attack on the United States. Retaining portions of U.S.

nuclear forces on alert helps to deter a potential adversary from attempting a disarming nuclear first strike against the United States.

To strengthen deterrence, the United States maintains the capability to launch nuclear forces under conditions of an ongoing nuclear attack. However, owing to the mutually-supporting elements of the nuclear Triad, U.S. nuclear forces do not rely on launch-under-attack to ensure a credible response. Rather, U.S. nuclear forces are postured to withstand an initial attack and provide maximum decision-making time for a President to gather information and respond in a time, place, and manner of our choosing.

It is simply incorrect to say U.S. nuclear weapons are on "hair-trigger" alert; they are not. The U.S. alert system prioritizes surety over speed. The United States rejects launch-on-warning and has set up a system of survivable and redundant sensors to detect and characterize potential attacks confidently. These capabilities enable policies and procedures that ensure the President has sufficient time and can properly characterize, understand, and if desired, respond to an attack.

The United States has spent decades refining and practicing launch procedures to minimize ambiguity and maximize positive control, and will continue the practice of not targeting any country on a day-to-day basis. The United States will continue to rely on open-ocean targeting so that in the highly unlikely event of any accidental or unauthorized launch of a U.S. nuclear weapon, the weapon would land in the open ocean.

Further moves to reduce alert levels (e.g., "de-alerting" ICBMs) are ill-advised, in part because reciprocation of such moves by nuclear-armed potential adversaries cannot be readily verified. More importantly, de-alerting proposals, if implemented, would make U.S. ICBMs a tempting target for preemption as well as create dangerous instabilities in a crisis, such as a race to re-alert.

Targeting

U.S. nuclear planning and targeting adhere to the laws of armed conflict. The United States has for decades rejected a deterrence strategy based on purposely threatening civilian populations, and the United States will not intentionally target civilian populations. The U.S. nuclear posture and alert status are tailored to enhance stability by ensuring that the United States retains sufficient survivable nuclear forces to ensure credible response options, no matter the nature of the adversary's attack.

Principles of U.S. Nuclear Employment

Responsive to U.S. Goals in Multiple Scenarios

The United States develops and implements its strategy for nuclear employment, and the resulting force posture decisions, based on the different types and severity of threat scenarios it faces. The U.S. leadership's deterrence goals and response options will necessarily differ depending on the scenario. In short, U.S. nuclear forces must be responsive to a number of needs and requirements across the range of scenarios that could create extreme circumstances that threaten the vital interests of the United States, and its allies, and partners.

U.S. strategy for nuclear employment informs its force sizing and posture decisions. The size and posture of the U.S. nuclear arsenal ensures the United States will retain flexible response options and can still hold at risk what potential adversaries value most – providing significant incentive for a potential adversary to refrain from attack or escalation.

After Nuclear Employment

Should deterrence fail, the United States will strive to end any conflict at the lowest level of damage possible and on the best achievable terms for the United States, allies, and partners. U.S. nuclear weapons employment guidance directs minimizing civilian damage to the extent possible consistent with achieving U.S. objectives and restoring deterrence. U.S. actions will seek to discourage adversary escalation by ensuring the adversary always concludes that the prospective costs of its aggression are much greater than any possible gain. If an adversary chooses to escalate the confrontation with the United States, it is imperative we maintain a range of flexible capabilities and options to present to the President that allow the United States to achieve its objectives.

Limited Nuclear Strikes: The United States believes currently that the most likely scenario for adversary nuclear employment is a limited nuclear strike in the context of an escalating conventional conflict. In the face of a limited nuclear attack against the United States, its allies, or its partners, U.S. nuclear forces provide a range of response options in scope and scale. A tailored and graduated nuclear response does not mean an adversary can confidently predict only a symmetrical response or that the adversary can define escalation thresholds by the manner of its initial nuclear use. What an adversary can confidently anticipate is the certainty of an effective U.S. response to nuclear attack, at any level and in any context, in ways that will impose greater costs than any expected or hoped-for gain.

The U.S. set of graduated response options is particularly valuable in situations where the adversary's threat calculus is not clear, or the level and type of threat the adversary finds

credible are uncertain. As noted, the United States will not limit itself to considering purely symmetrical responses, as these could spur open-ended, tit-for-tat exchanges. The U.S. flexible and graduated response strategy ensures there are a variety of credible options available, critical to demonstrating both U.S. resolve and restraint, and thereby deterring an adversary's attack or escalation.

As U.S. deterrence strategy makes clear, the United States maintains forces capable of delivering large-scale nuclear responses as well as limited and graduated response options that may be critical for deterrence credibility, particularly in scenarios that involve limited nuclear employment against the United States or an ally or partner. The United States continues to strengthen the credibility of its deterrent options against a limited nuclear attack on the United States and its allies, and partners.

Large-Scale Attack: No State should employ a nuclear weapon confident in its ability to control escalation. Similarly, although it is important that the United States tries to deter escalation, it cannot be certain its efforts to deter escalation will succeed. Should a crisis escalate into a large-scale nuclear attack on the United States or its allies or partners, the United States retains the option to pursue multiple objectives, from preventing further nuclear employment to inflicting intolerable costs on the adversary. The United States will sustain the diverse capabilities needed to deter large-scale attacks by ensuring that the adversary cannot anticipate significant political or military gain from its attack, and that the adversary will understand that the United States will impose intolerable costs exceeding any possible benefit gained from the adversary's decision to strike the United States, its allies, or its partners.

Planning Considerations

All nuclear plans must include the flexibility to tailor a response to the unique circumstances that would surround any nuclear crisis. To that end, the United States will also maintain a responsive and adaptive planning capability to support a flexible and tailored nuclear strategy and the ability to employ nuclear weapons in a conflict. Adaptive planning is regularly exercised, contributing to the credibility of U.S. deterrence strategies.

No First Use and Sole Purpose

To deter adversary aggression and assure allies and partners, the United States has never adopted a "no first use" policy and, given the contemporary and anticipated future threat environments, such a policy would be imprudent. Rather, the policy of the United States and the desire of its allies and partners is for the United States to retain calculated ambiguity regarding the precise extreme circumstances that might lead to a U.S. nuclear response. Those who argue that a U.S. "no first use" policy would be stabilizing should consider that

the United States and its allies and partners always remained skeptical of the veracity of the Soviet Union's public "no first use" policy during the Cold War (correctly, as it turned out), and today we harbor significant doubts concerning China's current "no first use" policy. The United States does not consider it prudent to assume states will adhere to their "no first use" pledges, even under the most stressful conditions of major conflict.

Similarly, the United States sees no benefit and significant risk in adopting a "sole purpose" policy in which the United States declares the sole purpose of nuclear weapons to be for deterring and responding to an adversary's nuclear use. A U.S. "sole purpose" policy, if potential adversaries believed it, would greatly simplify their decision calculus, remove doubt about the type of U.S. response to non-nuclear strategic attack, and potentially incentivize adversary employment of large-scale conventional aggression, chemical and biological weapons, or employment of other means of delivering highly destructive non-nuclear strategic attacks. In addition, a U.S. "sole purpose" declaration would dispirit allies and partners – raising doubts about U.S. defense commitments to them and increasing the chances of nuclear proliferation – while not affecting Russia or China, who would not believe such a declaration.

As stated in the 2018 NPR, the United States will "hedge against the potential rapid growth or emergence of nuclear and non-nuclear strategic threats, including chemical, biological, cyber, and large-scale conventional aggression. The capacity to hedge helps ensure our ability to sustain effective deterrence and assurance amid unexpected change."

Implications for the U.S. Nuclear Posture and Nuclear Stockpile

The United States will maintain the nuclear capabilities needed to deter adversaries, assure allies and partners, achieve objectives if deterrence fails, and hedge against unexpected challenges. DoD believes that these four missions are best accomplished with a strategic nuclear Triad and forward-based non-strategic nuclear weapons in Europe – a position consistent with updated guidance, the 2018 Nuclear Posture Review, and reflecting continuity with numerous internal reviews over multiple administrations.

The overall strength and adaptability of the U.S. nuclear Triad is evident in the fact that the 2018 Nuclear Posture Review recommended only supplemental modifications to the U.S. nuclear force, despite significant changes in the security environment. The first supplemental capability, the W76-2 warhead, modifies a small number of submarine-launched ballistic missile warheads to provide a low-yield option that is both prompt and can penetrate adversary air defenses in the near term. The W76-2 is meant to counter an adversary's perception of a gap in U.S. capabilities that can be exploited in a regional scenario. The other supplemental capability, the nuclear sea-launched cruise missile (SLCM-N), will provide a highly mobile and assured response option for added deterrence value

against adversaries, while also assuring allies and partners. Together, the W76-2 warhead and SLCM-N, which do not require or rely on host nation support, will provide additional diversity in platforms, range, and survivability, and a valuable hedge against future nuclear "break out" scenarios.

Given the range of possible adversary nuclear employment scenarios, it would be imprudent for the United States to reduce its nuclear forces unilaterally at this time or in the near future. Unilateral U.S. nuclear reductions would likely degrade the deterrence of attacks on the United States, its allies, and partners; undermine the assurance of allies and partners; and do nothing to halt the continuing modernization and projected substantial increases in Russian and Chinese nuclear arsenals. Instead, U.S. unilateral reductions could encourage Russian and Chinese expansion of their capabilities. In addition, unilateral U.S. nuclear reductions would undermine U.S. leverage in a future arms control negotiation.

In the face of an increasingly challenging and unpredictable threat environment, including diverse nuclear threats, the United States will continue to rely on the proven force posture of a Triad of nuclear delivery systems to deter strategic attack. To meet these ends, the United States will continue updating the Triad and stockpile to meet current and future threats.

Additional Implications

Increased Reliance on Conventional or Non-Nuclear Strike Capabilities or Missile Defenses

DoD provides U.S. senior leaders with a range of graduated response options, from conventional to nuclear, to deter aggression and intra-war escalation and accomplish U.S. objectives if deterrence fails. Although not a comparable substitute for the deterrent effects of nuclear weapons, U.S. conventional weapons contribute to U.S. deterrence and assurance efforts. To defeat an adversary strategy that includes coercive nuclear escalation and ensure the United States is prepared to respond at any point in the spectrum of conflict, DoD is pursuing the integration of conventional and nuclear planning when appropriate.

The modifications to U.S. employment strategy, plans, and options described in this report have not increased reliance on the missile defenses of the United States. The United States continues to rely on its nuclear forces to deter a Russian or Chinese nuclear and non-nuclear strategic attack on the U.S. homeland. U.S. missile defenses are not designed to, nor can they, negate Russia's or China's nuclear deterrent. Instead, U.S. policy is to develop and deploy missile defenses that stay ahead of the rogue State threat. U.S. missile defenses also will provide a measured level of protection against an unauthorized or accidental launch by any potential adversary.

Flexibility and Resilience of U.S. Strategic Forces

Our nuclear strategy requires maintaining a mix of flexible and resilient nuclear forces, NC3, and supporting infrastructure. The loss of any one leg of the Triad increases the risk of deterrence failure. For example, a U.S. nuclear arsenal without ICBMs would raise the relative value of each remaining U.S. nuclear asset, such as U.S. bombers and ballistic missile submarines, and thus incentivize additional adversary investments in air and missile defense and anti-submarine warfare capabilities – resulting in reduced U.S. and allied and partner security. Because deterrence and assurance requirements can change much more rapidly than the U.S. nuclear industrial base can respond, it is incumbent upon U.S. political and military leaders to preserve the inherent flexibility and resilience in the current nuclear Triad while ensuring future systems incorporate the highest levels of adaptability.

The United States cannot fully predict the development of future threats to the Nation, its allies and partners, nor can it predict the precise circumstances in which U.S. leaders may be compelled by events to contemplate nuclear employment. The ongoing U.S. nuclear modernization programs, effective intelligence, surveillance, and reconnaissance, and an adaptive planning process help to ensure that U.S. leaders will have the information and capabilities necessary to deter attacks and protect U.S. national interests.

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Document No. 2. Unclassified Statement of Charles A. Richard, Commander, United States Strategic Command Before the Senate Committee on Armed Services, February 13, 2020

Introduction

USSTRATCOM is a global warfighting command, and I am privileged to lead the 150,000 Sailors, Soldiers, Airmen, Marines, and Civilians who dedicate themselves to the Department of Defense's highest priority mission. I thank the President, Secretary of Defense, and Chairman of the Joint Chiefs for their confidence in me to lead this Command and the Department's nuclear enterprise. I also thank Congress for their continued support, which ensures USSTRATCOM has the required resources necessary to continue providing our Nation's strategic deterrence.

Commander, USSTRATCOM, as a key enabler and contributor to Joint Force operations, is the combatant commander responsible for Strategic Deterrence; Nuclear Operations; Global Strike; Joint Electromagnetic Spectrum Operations; Missile Defense; Analysis and Targeting; and Missile Threat Assessment. To execute our assigned responsibilities, the men and

women of this Command operate globally across all domains, to include the information environment. We work closely with the Joint Force across organizations, and with our Allies and partners to address the strategic challenges facing our Nation. Our mission: To deter strategic attack and employ forces, as directed, to guarantee the security of our Nation, our Allies, and our partners.

The Command's priorities are: 1) above all else, we will provide strategic deterrence for the Nation and assurance of the same to our Allies and partners; 2) if deterrence fails, we are prepared to deliver a decisive response, decisive in every possible way; and 3) we will do this with a resilient, equipped, and trained combat-ready force. A powerful, ready triad; a survivable nuclear command, control, and communications (NC3) system; and a responsive nuclear weapons infrastructure are the foundation that enables strategic deterrence and assurance which is fundamental to our survival as a Nation, and deters adversaries from conducting nuclear and non-nuclear strategic attacks against our Nation, our Allies, and our partners.

The dedicated professionals working for and with USSTRATCOM allow the Command to execute its operations and provide the Nation with its strategic deterrent against threats in all domains. Without the men and women of USSTRATCOM, actively performing the deterrence mission every day, we could not deter potential adversaries and guarantee the freedoms our Nation holds dear. To be clear, nuclear deterrence is the highest priority mission of the Department of Defense – our deterrent underwrites every U.S. military operation around the world and is the foundation and backstop of our national defense.

The ability of the United States to deter threats to our Nation and our Allies is at a critical point. The contemporary security environment is the most challenging since the Cold War. In the nuclear dimension, we face a range of potential adversaries, each with different interests, objectives, and capabilities. To maintain a credible deterrent in this environment requires us to modernize and recapitalize our strategic forces to ensure our Nation has the capability to deter any actor, at any level. Doing so requires we remain committed to modernizing and recapitalizing our strategic forces and supporting infrastructure, and that we continue to pursue the supplemental nuclear capabilities intended to address new challenges in the security environment.

A visible symbol of our commitment to nuclear modernization is the recently completed General Curtis LeMay Command and Control Facility (C2F) at USSTRATCOM. The C2F is one of the most advanced weapon systems ever constructed, and will be a critical element for the integration of global intelligence, nuclear planning, and operations with other combatant commands in coordination with our national leadership. Its modern infrastructure for Command and Control of strategic forces provides the flexibility for effective oversight and clear direction in a new era of global, integrated operations. We must proceed with

modernization. Sustainment and modernization of our nuclear forces has transitioned from something that we should do to something that we must do. Continuing to maintain the Nation's strategic deterrent needed to meet the challenges of the global security environment and to realize Presidential and Departmental guidance defined by the National Defense Strategy (NDS), National Military Strategy (NMS), and Nuclear Posture Review (NPR) requires continued Congressional support, budget stability, and on-time appropriations.

Global Security Environment

The NDS's prioritization of great power competition is the impetus for increasing lethality, strengthening alliances and partnerships, and reforming the Department in an increasingly complex global environment. It addresses the changing nature of threats to the United States. Competitors, such as China and Russia, are developing advanced capabilities to directly challenge our strengths across all domains. USSTRATCOM is committed to fulfilling our NDS requirements and searching out innovative ways to understand the environment and adapt to the challenges presented in the global security environment. We understand competition does not equal conflict, and war does not have to be an inevitable conclusion in an era of great power competition. However, we must be responsive to the increasing desire for state and non-state actors to reshape the world in their favor, doing so at the expense to the security of our Nation, our Allies, and our partners, and accepted international norms and rules. We must be capable of recognizing and communicating the potential for adversarial actors who use forces in any domain to coerce, undermine, or erode the current rules-based order.

China

China is advancing a comprehensive modernization program for the People's Liberation Army (PLA) and is building a robust, lethal force with capabilities spanning all domains, the electromagnetic spectrum, and the information environment. These initiatives increase China's ability to project power further from their mainland and support their aspirations to impose China's will throughout the Indo-Pacific region. Beijing's military modernization supports longstanding goals to establish regional hegemony, deny U.S. power projection operations in the Indo-Pacific, and supplant the U.S. as the security partner of choice.

China continues to expand and increase its strategic force capabilities. Despite maintaining a "No First Use" policy, China's lack of transparency regarding its modernization efforts to increase regional capabilities and to expand its overall arsenal bring its motives and intent into question. Among questions about Chinese intentions is their drive to likely double the size of their nuclear stockpile by the end of the decade. The PLA's range of new systems that complement its growing nuclear stockpile includes developing a survivable nuclear triad,

counter-intervention, and power projection capabilities to deter and deny foreign regional force projection in the Indo-Pacific. The PLA's Air Force (PLAAF) newly reassigned nuclear mission, and a deployment of a strategic bomber would provide China with its first credible nuclear triad. During the 70th Anniversary Parade in October 2019, the PLA unveiled new strategic nuclear systems, including the H-6N BADGER bomber, DF-41 intercontinental ballistic missile (ICBM), DF-17 medium-range ballistic missile, and improved submarine-launched ballistic missiles (SLBM). Other advanced systems include a range of ballistic missile defense technologies and increased anti-access/area denial operations. Finally, the PLA is developing a space-based early warning capability and more sophisticated command and control (C2) systems to safeguard the integrity of a larger, more dispersed force. Collectively, Chinese improvements to its nuclear capabilities raise troubling concerns and underscore the need to press on with modernizing our nuclear forces, including the supplemental capabilities outlined in the NPR.

Our Nation, and our Allies and partners, should not accept Chinese policies or actions that threaten the international rules-based order or undermine regional and global stability. We must remain postured to counter Chinese coercion and subversion, assure our regional Allies and partners, and protect our national security interests as international law allows.

Russia

Russia seeks to regain its role as a world power and erode U.S. leadership in world affairs. Russia continues to pursue a sphere of influence over the states on its periphery and attempts to dictate the parameters of those states' sovereignty, especially regarding matters of security or economics. Russian military doctrine emphasizes the potential coercive and military uses of nuclear weapons and Russia fields advanced capabilities to achieve these objectives. Moreover, Russian doctrine and rhetoric highlights a willingness to use nuclear weapons first, perhaps in an attempt to terminate a conventional conflict on terms acceptable to Russia.

Russia's aggressive and robust military and nuclear modernization campaign across its strategic triad and dual-use systems is close to completion. To date, Russia has recapitalized 76 percent of its strategic nuclear forces with modern weapons and equipment, strengthening its overall combat potential. It is easier to list the nuclear weapons and equipment Russia has not modernized, than it is to describe their all new equipment and capabilities. Upgrades to existing strategic forces include updating the Tu- 95MS BEAR strategic bomber and Kh-101/102 long-range, air-launched cruise missiles; building and deploying the DOLGORUKIY-class SSBN platform for the BULAVA SS-N-32 SLBM; replacing silobased and mobile ICBMs with newer systems and increased warhead upload capacity; and fielding the Avangard Hypersonic Glide Vehicle. In addition to modernization efforts, Russia is embracing new and novel technologies such as the TSIRKON hypersonic anti-ship

missile, Belgorod submarine, nuclear capable Poseidon unmanned underwater vehicle, Kalibr land-attack cruise missile, Kinzhal air-launched ballistic missile, and Skyfall nuclear powered intercontinental cruise missile. These advanced dualcapable systems are specifically designed to challenge U.S. and Allied deterrent structures and target our capabilities.

Over the past decade, Moscow has not only emphasized strategic forces preparedness, but also endeavored to enhance Russia's civil defense readiness for strategic conflict, and has conducted exercises geared towards increasing interoperability between civil and military organizations in a time of war. Additionally, both Russia and China appear to be expanding their strategic partnership in the Asia/Pacific Region. Last summer, this partnership went on display through a combined out-of-area (OOA) flight. Their joint efforts continue to erode transparency and predictability, use force to achieve their goals, undermine rules-based international order, and violate the sovereignty and territorial integrity of their neighbors.

Russia's nuclear forces include a range of strategic weapons, some not captured by existing arms control structures, and theater and tactical nuclear weapons entirely outside the arms control framework. Due to Russia's refusal to submit these theater (or non-strategic) systems to arms control limits or transparency initiatives, a considerable level of uncertainty clouds judgements on the scope and disposition of Russia's stockpile. However, Russia's overall nuclear stockpile is likely to grow significantly over the next decade – growth driven primarily by a projected increase in Russia's non-strategic nuclear weapons. Russia's determined pursuit of "non-strategic" nuclear weapons, together with their recent theory of nuclear rhetoric, indicates a troubling readiness to resort to nuclear weapons early in a crisis. Accordingly, our nuclear forces must include a sufficient range of capabilities such that Russia never mistakenly perceives any advantage from using nuclear weapons, at any threshold of violence.

North Korea and Iran

North Korea continues to defy international norms and conducts malign activities to foster regional instability. North Korea has tested ICBM-class missiles designed to reach the United States and has increased the number of short and medium-range ballistic missiles in its inventory. USSTRATCOM is committed to supporting the Department's efforts to work with like-minded regional partners to reduce military tensions and support our diplomats in achieving the final, fully verified denuclearization of North Korea.

Iran remains the world's leading sponsor of terror. By arming and utilizing proxy forces with advanced conventional weapons, Iran threatens our Nation and our partners in the region. Iran relies on its missile forces as a tool for signaling, propaganda, and retaliation, as observed through violation of the 2015 Joint Comprehensive Plan of Action (JCPOA), and

further illustrated by last month's ballistic missile launches against airbases in Iraq. Additionally, Iran continues to retain the technological capability and capacity to develop a nuclear weapon within one year of a decision to do so. Iran continues to ready and develop long-range ballistic missile capabilities, coupled with an aggressive strategy to destabilize the Middle East; calling into question Iran's commitment to foregoing nuclear weapons. Iran's actions introduce greater risk to an already volatile environment and threatens global commerce, security, and stability.

We remain vigilant to the threats both North Korea and Iran pose to the United States, our Allies and partners, and support on-going international and whole-of-government approaches to reduce these threats.

Integrated Strategic Deterrence

The 21st century global security environment presents challenges to deterrence. Competitors are conducting subversive actions below the levels of traditional conflict across all domains. Additionally, our adversaries are integrating nuclear, conventional, space, electromagnetic spectrum, and cyber capabilities to form an unprecedented range of threats; this includes the exploitation of the potential threat of nuclear employment to shape our response to their actions.

In a new era of warfighting, traditional Cold War deterrence concepts may be insufficient to deter the full range of threats in the modern security environment. The United States must apply tailored deterrent strategies to specific adversaries, while integrating the full spectrum of our military capabilities, both nuclear and conventional, with all elements of U.S. national power. An integrated strategic deterrence concept must leverage and exploit information advantage to seek long-term gains and capabilities in response to advancing threats; and fully assess the risks associated with deterrence failure. To address 21st century challenges, integration cannot stop within our government. Building and maintaining our relationships are critical to preserving shared interests and responding to mutual threats. The Command continues to engage with Allies and partners to strengthen relationships, build trust, and set conditions across the globe.

USSTRATCOM supported seventeen senior-level international engagements in 2019, including visits to the United Kingdom, Denmark, and Canada as well as visits from the United Kingdom, Denmark, Japan, Australia, the Republic of Korea, and 32 Defense Attachés through the International Visitor Leadership Program (IVLP). Our daily interactions with our Allies and partners coupled with Bomber Task Force (BTF) deployments, submarine port-calls and visits, and cooperative missile defense activities provide unique opportunities to strengthen relationships, build trust between our senior leaders, and increase the interoperability of our forces. The Command also hosted an annual Deterrence Symposium

to exchange viewpoints on security challenges; senior political, military, and academic leaders from over 13 nations attended this event.

To facilitate these interactions, Headquarters USSTRATCOM hosts permanently assigned liaison officers from Australia, Canada, Denmark, the Republic of Korea, and the United Kingdom; and our Joint Functional Component Command for Integrated Missile Defense hosts a liaison officer from Germany. These Foreign Liaison Officers serve as a conduit between the Command and their nations' militaries. To the extent possible, liaison officers and their superiors participate in our Tier 1 globally integrated exercises, offering mutual benefits to our Allies and the United States. These peacetime engagements develop relationships before a crisis. This past year's successes have included funding secure communication infrastructure compatibility, defining operational relationships, enhancing our military interoperability, improving combined capabilities across our Allies and partners, and integrating critical defense missions to assure Allies and partners of our Nation's extended deterrence commitments and nonproliferation objectives.

Globally Integrated Operations

Globally integrated operations remain essential to achieving defense objectives in this era of great power competition. The worldwide dispersal of friendly and adversarial forces create both opportunities and challenges. As a Joint Force, we must continue to work with our Allies and partners across geographic and warfighting boundaries to create security advantages. Additionally, the Joint Force must increase proficiency in employing global capabilities - space, cyber, and special operations forces - hand-in-hand with traditional air, land, and sea warfighting capabilities. The essence of globally integrated operations is the alignment of the Joint Force in purpose, time, and tempo regardless of which commander is responsible for execution; this is particularly important for execution of the strategic deterrence mission where the operations and activities of combatant commanders significantly affect deterrence success. Investments in cross-combatant command coordination are vital. There is also a temporal aspect to global integration; the ability of operational commanders to gain warfighting advantages depends on enacting decisions faster than our adversaries. In the last year, the Joint Force has made enormous strides in implementing the Secretary's vision for global integration, but we must continue on the path to defend the Nation's interests in the 21st century.

Nuclear Operations

USSTRATCOM bears the responsibility for operating our Nation's nuclear triad. The Nation's nuclear triad is safe, secure, and effective; and is foundational to our survival. It remains the greatest contributor to deterring adversaries from conducting nuclear and non-nuclear strategic attacks against our Nation, and our Allies and partners. However, the Nation is at a

critical juncture regarding the future of our nuclear forces. Since the end of the Cold War, we led the world in reducing our nuclear stockpile while increasing transparency. While we reduced the number and types of nuclear weapons in our arsenal, our adversaries went in the other direction and continued to modernize and expand their strategic capabilities. We now find ourselves fielding a reduced Cold War era arsenal against a larger, more modern, and more varied Russian force and a continually improving and growing Chinese force. If we do not address 2018 NPR recommendations, this will create the potential for insufficient flexibility in the triad to impose costs and deter all potential conventional and nuclear threats in the early-2030s. For the last three decades, we have anticipated reaching a tipping point in the nuclear weapons complex. That point is almost here. Our weapons, NC3, and triad delivery systems will soon reach retirement or require refurbishment. If we do not invest smartly and consistently in our nuclear enterprise now, we will need to rebuild from scratch the talent and infrastructure required to design the deterrent forces for our Nation's future needs. As the foundation for deterrence for our Nation, Allies, and partners, we must continue to sustain, modernize, and recapitalize our Nation's strategic nuclear capabilities. Previous de-emphasis on our nuclear deterrent and the infrastructure that supports it, coupled with a changing security environment, coupled with adversaries that are modernizing and creating increasingly capable forces, has led us to the point where we must modernize now to continue to maintain a viable deterrent in the future. We appreciate that Congress has recognized the importance of modernizing U.S. nuclear forces after decades of deferred recapitalization and has funded these programs. We request your continued support to modernize and sustain our Nation's nuclear deterrent.

Land-Based Strategic Deterrent

USSTRATCOM's geographically dispersed ICBM force is the most responsive leg of the triad, continuing to deliver a highly reliable, secure deterrent capability and an overwhelming challenge to defeat. While the Minuteman has served as the backbone of our Nation's ICBM force since 1962, its aging infrastructure, and asset attrition require a comprehensive weapon system replacement beginning in 2028. The Air Force remains focused on sustaining our ICBM force at the lowest reasonable cost. The Ground Based Strategic Deterrent (GBSD) Analysis of Alternatives provided decisive analysis that continued life extension of the Minuteman III (MM III) would be more costly than a replacement system and would not address future challenges and threats to our current ICBM force. GBSD is the lowest risk, highest value decision to meet current and future military requirements.

USSTRATCOM supports the ongoing MM III sustainment programs needed to keep the weapon system viable and effective until GBSD reaches full operational capability in 2036. Smart, consistent sustainment of our current missile systems, while we modernize the ICBM force, will ensure an effective deterrent remains for many decades. GBSD is a just-in-time

replacement program, and we cannot afford to have the MM III weapon system deteriorate prematurely.

The GBSD program completes the Technology Maturation and Risk Reduction (TMRR) phase in FY2020 and transitions to Engineering and Manufacturing Development (EMD) following a successful Milestone B decision this year. USSTRATCOM remains firmly committed to GBSD as the Air Force pursues mature, low-risk technologies, modularity, and open system standards to enable affordable technology insertion. On-time GBSD deployment remains a USSTRATCOM imperative; we must keep requirements stable and protect existing schedule margin or where possible, expand these schedule margins.

GBSD, when fielded, will be an affordable, modern weapon system, deployed in updated infrastructure and fully integrated into a modernized NC3 system. Our ICBMs, and prospectively the GBSD, raise the threshold of an adversary's attack on the homeland by presenting an intractable targeting problem. Eliminating our ICBM capability, and specifically the GBSD, would be dangerously provocative, present a less credible strategic threat, and grant adversaries a vastly reduced target set – raising the risk to our Nation of a disabling first strike. Thus, USSTRATCOM strongly supports the Air Force in providing GBSD to ensure our deterrent remains effective and lethal in an ever-changing and increasingly threatening strategic environment.

Air-Based Strategic Deterrent

The bomber leg of the nuclear triad is the most flexible and visible aspect of our Nation's nuclear forces. Through their discernable adaptability, bombers continue to provide a wide variety of deterrence options to the President and unambiguously signal unwavering resolve to our adversaries. Additionally, their persistence and reliability of our bomber force reassures our Allies and partners. Nevertheless, current bombers and associated weapon systems are beyond or quickly approaching their intended end of service life and require sustainment to remain operational and modernization to address evolving and emerging threats.

The B-52 remains the backbone of the bomber force and will remain in service for an additional 30 years. It serves as an important hedge against delays in our future bomber programs and is a key component of the Nation's triad. To remain effective, the B-52 must receive several critical upgrades. First, the B-52's Commercial Engine Replacement Program will replace the existing TF-33 engines (1960s era) that are becoming increasingly unsupportable, and will also yield increased fuel efficiency resulting in greater range, longer flight times, and reduced tanker requirements. In addition to new engines, modernization plans are underway to upgrade the B-52's radar, avionics, and NC3 systems, which must remain on schedule to meet the operational requirements of our airborne deterrent

requirement. The B-2 is the only long-range, penetrating stealth bomber in the world. It is imperative we maintain the B-2's unique deterrent and combat capability, until replaced by the B-21. Decisions on the future bomber force structure and key enablers must be based upon strategic imperatives and combat effectiveness, ensuring no capability gaps for critical tasking across the family of operational plans (nuclear and conventional).

The future of the bomber force is the B-21 Raider. Designed to meet NDS objectives and based on firm requirements leveraging existing and mature technology, the B-21 will deliver unrivaled combat capability. It is an Air Force "Top 3" acquisition program with a planned procurement of at least 100 aircraft and is currently executing in the EMD acquisition phase. The B-21 will utilize both direct attack and standoff weapons, providing a multitude of options to the warfighter to meet national objectives. It is critical the Air Force delivers the B-21 on time and on budget to meet the Nation's deterrence objectives and global security requirements. In addition to the bombers, the air delivered weapon stockpile modernization is also occurring through just-in-time Life Extension Programs (LEPs). Notably, the Long Range Standoff (LRSO) weapon coupled with the W80-4 warhead will replace the Air Launched Cruise Missile (ALCM) and its W80-1 warhead as that system faces reliability and sustainability challenges. Likewise, the B61-12 will replace aging B61 nuclear gravity bombs deployed on strategic long-range bombers and on our Nation's and Allies' Dual Capable Aircraft (DCA). The B61-12 life extension includes a guided tail kit assembly to improve weapon accuracy, enabling a more accurate, single gravity nuclear weapon capability that will enhance our Nation's nuclear deterrent and the extended deterrence provided to our Allies and partners.

The success of all bomber missions depends on adequate tanker support to achieve the necessary global reach to hold strategic targets at risk. The KC-46, currently in the Initial Operational Testing and Evaluation (IOT&E) acquisition phase, will partially replace the aging KC-135 fleet. Air Force leadership continues to engage with Boeing to ensure the new tanker will meet operational objectives.

Sea-Based Strategic Deterrent

The OHIO-class SSBN with the highly capable Trident II D5 ballistic missile constitutes the most survivable leg of our nuclear triad and provides a reliable deterrent to our adversaries around the world. The SSBN's ability to operate continuously and clandestinely sends a very clear message that our adversaries cannot benefit from a strategic attack against the U.S. or our Allies.

The OHIO-class SSBN is a marvel of technology and its robust design, along with a comprehensive maintenance program, has allowed it to be life extended from 30 to 42 years – longer than any previous submarine class in U.S. history. The Navy has never kept a single

submarine in service longer than 37-years, let alone an entire class. There is no margin to extend the OHIO-class further; therefore, the COLUMBIA-class SSBN must field on time to avoid a capability gap in the triad. It is essential we maintain our technological advantage in this critical mission, and to this end, the Navy has designated COLUMBIA as the top shipbuilding priority in order to ensure its first strategic deterrent patrol in FY2031. As production begins, we must support our industrial partners' expansion of both infrastructure and training programs to minimize risk.

Furthermore, to remain survivable, we must address anticipated security threats that could undermine our own future capabilities. Advancements in Russian submarine stealth and detection requires us to remain committed to the recapitalization of our Integrated Undersea Surveillance System (IUSS) to preserve our advantage in the undersea domain.

Following the decision to extend the OHIO-class SSBN, the Navy determined the need to life-extend the Trident II D5 ballistic missile, both to address obsolescence issues and to ensure the required quantity of deployable ballistic missiles into the early 2040s. The life extension program, known as D5LE, will ultimately serve as the transition missile from OHIO to COLUMBIA. Additionally, efforts are underway to further extend the D5 missile through the life of the COLUMBIA with the D5LE2 program. D5LE2 will recapitalize the D5, using highly reliable components still in production, pull forward previously unused system margin, and provide a more cost effective design with sufficient flexibility to account for evolving threats. In order to realize these capabilities, we must revive an atrophied industrial base required to produce critical non-nuclear components employed on the D5LE2. To enhance the flexibility and responsiveness of our nuclear forces as directed in the 2018 NPR, we will pursue two supplemental capabilities to existing U.S. nuclear forces: a low-yield SLBM warhead (W76-2) capability and a modern nuclear sea launched cruise missile (SLCM-N) to address regional deterrence challenges that have resulted from increasing Russian and Chinese nuclear capabilities. These supplemental capabilities are necessary to correct any misperception an adversary can escalate their way to victory, and ensure our ability to provide a strategic deterrent. Russia's increased reliance on non-treaty accountable strategic and theater nuclear weapons and evolving doctrine of limited first-use in a regional conflict, give evidence of the increased possibility of Russia's employment of nuclear weapons. We must counter these dangerous perceptions with the supplemental capabilities the LYBM and SLCM-N will provide. An analysis of alternatives is under way for SLCM-N.

Nuclear Weapons and Supporting Infrastructure

Today's nuclear stockpile meets current operational and policy requirements. While the stockpile and its supporting infrastructure are safe, secure, reliable, and effective, both remain fragile. Many of our weapons have remained in service well beyond their original design lives, owing to the robustness of original designs and the Department of

Energy/National Nuclear Security Administration's (DOE/NNSA) continuing stockpile stewardship efforts. However, the accumulation of concurrent risks and capacity margins limit the ability to mitigate adverse impacts to the deterrent. Insufficient resourcing over the past 30+ years postponed much-needed weapon and infrastructure modernization programs, which typically require 10-15 years to execute. Directive policy changes affecting priorities and inefficient program execution across administrations have directly contributed to the related erosion in the critical capabilities and capacity of our strategic deterrent forces. As a result, many of the modernization and sustainment efforts necessary to ensure the deterrent's viability have zero schedule margin and are late-to-need. I firmly support the Secretary's and Chairman's public statements identifying nuclear deterrence as the highest priority mission of the Department of Defense. Our nuclear deterrent underwrites every U.S. military operation around the world and is the foundation and backstop of our national defense. I cannot overemphasize the need to modernize our nuclear forces and recapitalize the supporting infrastructure to ensure we can maintain this deterrent in the future. I am concerned that the oft-repeated message of the need to modernize and recapitalize has lost its impact, and that collectively we have underestimated the risks associated with such a complex and time-constrained modernization and recapitalization effort. Even seemingly small issues can have a disproportionate impact on the force. We cannot afford more delays and uncertainty in delivering capabilities, and must maintain a focus on revitalizing our nuclear forces and the associated infrastructure.

The 2018 NPR described a hedging strategy to meet future risks and unexpected challenges. The atrophy in our nuclear weapons supporting infrastructure is consuming our hedge for avoidable programmatic risk. We no longer have hedge capacity to fully account for geopolitical risk, technological risk, or operational risk. Continued modernization and sustainment work deferral will only further exacerbate an already untenable situation as we repeatedly extend weapon lifetimes and do not invest in the diagnostic capabilities needed to ensure confidence in the viability of these systems. To maintain military effectiveness in the future, we must execute the program of record (POR) immediately, and invest in advanced diagnostic, research, and development activities to mature emerging technologies to certify and field a modern deterrent for the 21st century. The next generation of deterrent forces must encompass responsive weapon systems, world-class personnel, resilient infrastructure, and intelligence informed decisions. We must address emerging 21st century threats that may reduce the effectiveness of our nuclear deterrent force.

The NNSA took efforts in 2019 to address a gap identified in the 2018 NPR by converting a small number of W76-1s into the W76-2 low-yield variant. W76-2 deliveries to the Navy and remaining production are continuing as scheduled in FY2020. In 2019, our weapon modernization programs saw a setback when reliability issues emerged with commercial off-the-shelf non-nuclear components intended for the W88 Alteration 370 program and the B61-12 LEP. NNSA has worked closely with DoD to mitigate impacts, but correcting these

issues will delay initial fielding of both systems. Finally, another just-in-time program is the W80-4 LEP, which remains in synchronized development with the LRSO delivery system. It is critical for this standoff attack capability program to remain on track.

While air-delivered weapon modernization is proceeding in the B61-12 and W80-4, we must begin efforts now to modernize ballistic missile warheads for our ICBM and SLBM force in the 2030s and 2040s. After the 2018 NPR, re-evaluation of our stockpile strategy shifted to pursue separate NEP designs for the Air Force and Navy. However, the ballistic missile end-state remains the same: address known and projected aging and performance concerns; preserve triad attributes; balance warhead types across the force; and improve inter- and intra-leg hedge capability. The Air Force is developing the MK21A/W87-1 to replace the W78 ICBM warhead that will be over 50 years old when finally retired. When deployed, the W87-1 will provide enhanced safety and security compared to all other ballistic missile warheads.

The Nuclear Weapons Council has established a requirement for the W93/Mk7 warhead. This warhead will provide USSTRATCOM and the Navy a means to address evolving ballistic missile warhead modernization requirements, improve operational effectiveness, and mitigate technical, operational, and programmatic risk in the sea-leg of the triad. This effort will also support a parallel Replacement Warhead Program in the United Kingdom whose nuclear deterrent plays an absolutely vital role in NATO's overall defense posture. Without a coordinated, joint effort to develop and field the W93/MK7 as a system, the bulk of our day-to-day deterrent force will be at increased risk in the early 2040s due to aging legacy systems. Given the potential severity of impacts on overall deterrence from late delivery of the W93/MK7, it is imperative the complex work to identify opportunities to accelerate the development timeline and invest in technologies to reduce schedule risk. Research and development efforts for critical national capabilities, such as fuzes and aero shells, must begin immediately to deliver a capability in the 2030s that maintains a credible at-sea deterrent through the 2050s and beyond. Our present Nuclear Security Enterprise (NSE) infrastructure, which we count on to sustain our strategic deterrent, continues to atrophy and requires timely recapitalization. NNSA planned facility improvements to critical capabilities will not materialize in the near-term, yet facility age and capacities currently limit our ability to timely respond to unforeseen technical, geopolitical, programmatic, or operational developments. The non-nuclear component issue affecting the B61-12 LEP and W88 Alteration 370 program is a symptom of a fragile enterprise – a single component failure caused a disruption across multiple programs for a period of years. USSTRATCOM is able to mitigate the operational impacts today, but proposed steps to reduce accumulating further operational impacts provide a partial capability at best. The Nuclear Weapons Council Strategic Plan, NNSA Stockpile Stewardship and Management Plan, and 2020 Requirements and Planning Document describe a path forward to enable an effective, responsive, and resilient NSE, but successful navigation of the path will only be possible through continued on-time investments.

USSTRATCOM supports NNSA's highest infrastructure priority to reconstitute plutonium pit production. Since the closure of the Rocky Flats facility 30 years ago, no significant quantities of new pits have been added to the stockpile. The Nation must be able to produce no fewer than 30 pits per year in 2026 and produce at least 80 pits per year during 2030 to maintain stockpile effectiveness. This capacity is the minimum required to execute the POR; anything less will force difficult decisions on which modernization programs to defer, which could result in a less-capable nuclear deterrent, and accept unprecedented pit ages. The NNSA's two-site plan to achieve plutonium pit production at Los Alamos National Lab and the Savannah River Site is prudent and necessary to achieve pit production requirements rather than accept pit lifetimes that threaten the confidence in our weapons' capabilities.

Failure to accomplish these goals will place all future stockpile modernization programs at risk. In addition to plutonium pit production, the NSE must continue to recapitalize capabilities to process uranium and lithium, produce tritium, manufacture and procure trusted radiation-hardened microelectronics, and manufacture non-nuclear components in sufficient quantities to sustain and modernize the force. Production of nuclear weapon components and the materials needed to construct them effectively stopped during the 1990s when we began to life-extend legacy systems. This includes recruiting and developing the specialized workforce and experts required to produce and maintain these systems. Maintaining a safe, secure, reliable, and effective strategic deterrent into the future requires restoring or increasing the capacity of these material, component, and workforce capabilities.

Congressional legislation has recognized and supported the need for an effective, responsive, and resilient NSE by directing the NNSA to continually exercise all capabilities required to conceptualize, develop, engineer, certify, and deploy nuclear weapons. The Stockpile Responsiveness Program (SRP), combined with the POR and its supporting science program, enables a process to exercise the development of nuclear weapons. I remain supportive of the program, especially activities like the rapid design-to-test experiment, which cuts time from clean-sheet design to hydrodynamic test by two-thirds. Maintaining a safe, secure, reliable, and effective stockpile that continues to meet its intended deterrence and assurance roles into the future will require consistent, predictable funding for weapons modernization and the supporting infrastructure over the next two decades. Failure to make this investment presents an existential risk to the Nation. Success hinges on continued coordination between DoD and NNSA as well as the consistent cooperation among all stakeholders.

Nuclear Weapons Safety and Security

Our nuclear security standard is complete denial of unauthorized access to nuclear weapons. We have worked closely with our Navy and Air Force partners to assess nuclear security requirements and adjust our force posture, training, and equipment to address current and

evolving threats. While we continue to advance our security capabilities, there are areas where additional investments are necessary to maintain the high standards this mission demands.

The proliferation, ease of use, and sophisticated capabilities of small, unmanned aircraft systems (sUAS) pose a threat to our operations. The Department continues to field counter sUAS capabilities and are refining tactics, techniques, and procedures to address the developing threat. Focused leadership, vigilance, and dedicated investment are necessary to remain ahead of this challenge. With intense advocacy from our Command and strong support from Congress, we achieved a significant ICBM security milestone with the Air Force awarding a contract to replace our Vietnam-era UH-1N helicopter fleet with the new MH-139 "Grey Wolf." The Air Force expects delivery of the first two aircraft to Eglin AFB in 2020 for developmental testing. Delivery of subsequent aircraft to each missile wing will provide full operational capability by FY2027. With this program moving forward, we can now focus our efforts on replacing aging armored security vehicles with Joint Light Tactical Vehicles, equipped with advanced weapons and communications systems that will provide security personnel uninterrupted situational awareness anywhere they operate.

Finally, we encourage Congress to continue supporting our ICBM Transportation and Handling equipment. The Payload Transporter Replacement and Transporter Erector Replacement Programs will provide safe, secure MM III solid rocket motor (SRM) transport, removal, and emplacement, and over the coming years, these heavily tasked force enablers will facilitate the transition from MM III to GBSD. We continue to support fully funding the weapons security programs for on-time delivery, enhancing the security of our strategic weapons and our vast ICBM complex.

Nuclear Command, Control, & Communications

Our layered approach to providing NC3 capabilities remains reliable and effective in our current strategic environment; however, we have identified challenges in the near-term to address maintaining deterrence in the coming decades. Our posture and capabilities were adequate for the Cold War needs, especially against the Soviet-era ballistic missile and bomber threats. Now, we face improved adversarial capabilities in air- and sea-launched cruise missiles and evolving space and cyber threats. We must look beyond traditional ballistic missile profiles and understand the full spectrum of threats to NC3. We must innovate and outpace those threats to maintain our deterrent capabilities. Our continued focus is to maintain positive command and control of U.S. nuclear forces at all times, before, during, and after a nuclear attack. As we modernize our triad, we must maintain current capabilities while we address future NC3 requirements. This is one of my top priorities.

In October 2018, the Secretary of Defense designated the Commander, USSTRATCOM, as the NC3 Enterprise Lead responsible for NC3 enterprise operations, requirements, and systems engineering and integration. Last year, USSTRATCOM established the NC3 Enterprise Center (NEC) and started building relationships with the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) as the NC3 Capability Portfolio Manager (CPM). In the effort to consolidate authorities and responsibilities for the NC3 portfolio, we jointly presented the status of the NC3 Enterprise to the Deputy Secretary of Defense and the Chairman of the Joint Chiefs of Staff; this will reoccur on a continual basis as directed by the Secretary of Defense.

USD(A&S) and the Commander, USSTRATCOM, coordinated and recommended adjustments for our most pressing NC3 shortfalls. We support fully funding our approach to quantitatively assessing the NC3 enterprise. While an understandably complex and ambitious undertaking, we want to be able to model and monitor the entire enterprise. Data science is quickly proving its value to industry and we need to leverage this capability and implement it into our approach to assess the NC3 Enterprise's mutually supportive, interdependent architecture. Additionally, in order to move forward, we must provide the necessary manpower to build enterprise level capabilities.

Last year we saw success in validating the mission need statement for the next generation NC3 architecture. We are continuing to build out processes and supporting capabilities that will be foundational to establishing an architecture that is mutually supportive and resilient to the entire spectrum of attacks. While we develop the next generation NC3 to conduct nuclear command and control (NC2) over assured communication paths, we must consider how NC2 infrastructure will align and interoperate with the future Joint All-Domain Command and Control (JADC2) structure. Future NC3 architecture will retain elements specific to NC2 while leveraging JADC2 to maintain resilient and redundant C2 and facilitate quick decision cycles.

In order to provide continuous communications and control of nuclear forces between the President, senior advisors, and Joint Forces, we must maintain our Advanced Extremely High Frequency (AEHF) satellites, paired with ground and airborne Family of Advanced Beyond Line of Sight Terminals (FAB-T). We continue to develop the plan for the next generation of airborne command and control aircraft, replacing the legacy E-4B National Airborne Operations Center (NAOC), E-6B Airborne Command Post (ABNCP) and Take Charge and Move-Out (TACAMO), and C-32 Executive Transport fleets. Existing capabilities will need to retain their current roles and may need to accept new ones as our next generation of NC3 takes shape. As we build on our airborne communication capabilities, we are evaluating the relay capabilities of ground forces to augment and enhance the survivability and endurance of our airborne layer. The Air Force's Global Aircrew Strategic Network Terminal (G-ASNT) gives our ground forces a multi-band communications system to maintain situational awareness and relay direction to nuclear forces not in direct contact with decision makers.

Cutting across all of these capabilities is the cyber defense of the systems themselves. Our NC2 hardware infrastructure fails if the NC3 fails due to a cyber-attack. We must continue to invest in active, persistent cyber defense of our NC3 systems, both current and future. We have collaborated with USCYBERCOM, USD(A&S), and the Services to ensure our existing NC3 systems remain free of adversary influence in real time and to protect our future NC3 acquisitions and sustainment from cyber threats. Cyber defense is not a "trade space" discussion; it is an additive necessity in today's technologycentric world.

USSTRATCOM, as the NC3 Enterprise lead, will continue to develop the Enterprise's future requirements and ensure a safe, secure, and reliable architecture for the future. As we move towards the next generation of NC3, we must work with industry to rapidly prototype new technologies and experiment with them to determine their effectiveness. In addition, we will continue cooperation on NATO NC3 systems that require modernization to enable appropriate consultations and effective nuclear operations, improve survivability, resilience, and flexibility. We need to move rapidly and if a new technology appears promising, acquire and field it quickly – and if our experiment shows it is not feasible, to "fail fast," and move on. We rely on the necessary resources for sustainment and modernization of NC3 systems. We must also attract the right experience and talent needed to fulfill enterprise manpower requirements to develop the innovative NC3 solutions described in the NC3 Enterprise Center Mission Needs Statement. A combined effort between the Services and Agencies, National Labs, industry, and academia are necessary to generate innovative ideas, establish working relationships with key stakeholders, and maintain deterrence during this transition. I am confident in the forming relationships and the direction the Department is taking to prioritize NC3 modernization.

Global Strike

Strategic competitors continue to invest in and rapidly develop anti-access/area denial capabilities to counter U.S. military advantages in power projection and freedom of movement. Additionally, competitors are developing hypersonic weapons as part of this counter-intervention strategy. The Department requires flexible, prompt, survivable response options for global strike. Continued investment and a commitment to fielding advanced capabilities are crucial to offset these threats and ensure our deterrence and conventional power remains strong into the future.

Offensive hypersonic strike weapons will provide conventional capabilities to ensure the Joint Force can deter aggression in contested environments short of nuclear use. They provide a highly responsive, long-range, conventional strike capability for distant, defended, or time-critical threats when other forces are unavailable or not preferred. Fielding advanced hypersonic capabilities will allow us to tailor our strategies and plans with an

expanded range of conventional options. While not a replacement for nuclear weapons, new classes of hypersonic weapons will complement and enhance strategic deterrence and can deliver surgical strikes to provide effects or be integrated into larger campaigns, increasing the effectiveness of our warfighting advantages.

For more than a decade, the U.S. matured its hypersonic strike technologies and successfully demonstrated their significance to future warfighters. FY2020 represents a pivotal year for hypersonic weapon development and fielding as the Department begins aggressively flight testing capabilities across multiple domains and posturing the industrial base to produce these systems at scale to allow the Services to field operational capabilities in the near-term. A flexible mix of capabilities launched from land, sea, and air will provide a constant, visible, and global presence designed to influence adversary behavior in all stages of conflict without crossing the nuclear threshold, and will provide an effective deterrent and strike capability in the near-term to address current and future threats.

Missile Defense

As a global warfighting command, Commander, USSTRATCOM is the coordinating authority and is responsible for global missile defense planning in coordination with other combatant commands, Services, and agencies that employ our Nation's missile defense capabilities. USSTRATCOM's Joint Functional Component Command for Integrated Missile Defense (JFCC-IMD) supports missile defense operations worldwide: this means helping to identify and minimize gaps and seams in regional planning, conducting missile defense operations support, and advocating for capabilities on behalf of all other combatant commanders.

While current missile defense capabilities ensure defense of the homeland against a rogue ballistic missile threat, a concerted U.S. effort is required to expand and improve existing capabilities for both homeland and regional missile defense. Potential adversaries are improving existing missile system capabilities and capacities, blurring missile defense operations across traditional regional boundaries. Solving the trans-regional threat, increased range, and lethality requires more than just active missile defense; we must address the problem of decreased warning and adjust defensive postures appropriately. Navigating this environment requires a comprehensive approach that establishes a renewed emphasis on leveraging opportunities to negate missile threats prior to launch, during all phases of flight, and after impact, drawing on effects generated from capabilities throughout all domains.

As the warfighter advocate for missile defense, USSTRATCOM must focus developers on examining, developing, and exploiting advanced concepts and technologies. Research and development across all domains is key to ensuring we keep pace with evolving adversary threats, such as hypersonic weapons and cruise missiles. Future space-based sensors may

be able to provide birth-to-death detection, tracking, and discrimination of hypersonic glide vehicle, cruise missile, and ballistic missile threats globally. These abilities cannot be fully achieved with the current or future terrestrial-based radar architecture due to the constraints of geography and characteristics of future missile threats.

Our regional missile defenses protect against missile attacks on deployed U.S. forces, Allies, and partners; assist Allies and partners in better defending themselves; preserve freedom of action; and counter adversary anti-access/area denial tactics. However, challenges remain to the Department's efforts to fully integrate and optimize limited defense resources and architectures through Allied and partner integration and interoperability. USSTRATCOM's NIMBLE TITAN exercise series, with participants from 24 countries and four international organizations, advances multinational collaboration through the experimentation of operational integration concepts to enhance deterrence and defense against missile attacks.

The Ground Based Interceptors (GBI) currently emplaced have the capability of defending the homeland from today's rogue threat. Although we are pursuing development of the Next Generation Interceptor (NGI) to complement our GBI capability, we need to examine new approaches to defeat ICBMs in ways that repurpose existing options and are cost effective. As we address future threats, we must account for the air and missile defense assets required to defend the homeland, while simultaneously improving our regional security architectures. We continue to embrace new and developing technologies and find innovative ways to use, as well as repurposing existing technologies to strengthen and expand current capabilities. Examples include developing an underlay for homeland defense to account for ballistic missiles and using existing sensors for tracking ballistic, hypersonic, and cruise missile threats.

The 2019 Missile Defense Review (MDR) provided an opportunity to conduct focused reviews clarifying and optimizing missile defense roles and responsibilities across the Department. In accordance with the MDR, the Department is reviewing policy, responsibilities, and procedures for missile defense research, development, test and evaluation, procurement, operations, and sustainment. Revised improvements to the Warfighter Involvement Process (WIP) will meet 2019 MDR guidance, align with Department budget process and maximize warfighter input in capability development and acquisition, and seeks to deliver missile defense capabilities in a timely manner. USSTRATCOM is working with the community of interest to update the WIP and incorporate findings established in the MDR. As Commander, I will continue to advocate for missile defense requirements through continued capability and utility assessments and by ensuring operational tests and evaluations meet warfighter demands. Missile defense endures as a critical component of comprehensive U.S. strategic and tailored regional deterrence strategies and is a key element of any integrated response options.

Joint Electromagnetic Spectrum Operations (JEMSO)

The Electromagnetic Spectrum (EMS) is the one physical maneuver space depended upon by forces across all warfighting domains. If we cannot achieve EMS superiority and assure access to the EMS, the joint force cannot prevail. Our adversaries have observed our use and dependence on the EMS, and have developed and organized their forces to achieve EMS superiority; it is essential we develop capabilities and appropriately organize to counter this threat. Achieving and maintaining EMS superiority is the critical enabler for successful Joint Force operations.

To address warfighter requirements, USSTRATCOM collaborates with the Secretary of Defense Electromagnetic Spectrum Operations (EMSO) Cross Functional Team, the Electronic Warfare Executive Committee (EW EXCOM), the Services, the DoD Chief Information Officer (CIO), the joint staff, and Under Secretary of Defense offices to advocate for essential warfighter EMSO capabilities. Additionally, we engage with Australia and North Atlantic Treaty Organization partners to ensure compatible JEMSO doctrine, capabilities, and concepts of operation.

USSTRATCOM led the effort to create the first Joint Publication for JEMSO. Working with DoD CIO and Defense Information Systems Agency (DISA), USSTRATCOM provided the initial warfighter requirements for an Electromagnetic Battle Management (EMBM) system to achieve EMS superiority. In coordination with the DISA Defense Spectrum Organization, USSTRATCOM is establishing the initial Joint Electromagnetic Spectrum Information Analysis and Fusion capability that will provide spectrum specific data for battle management and combatant command operational cells.

Our Command also led a combatant command JEMSO cell manpower requirement validation study through the joint manpower validation process for the FY2022 Program Objective Memorandum budget. All of these warfighter requirement initiatives will require sustained investments.

Conclusion

USSTRATCOM is a global warfighting command, actively and successfully deterring strategic attack against our Nation and our Allies. The men and women of our Command are committed to maintaining a safe, secure, reliable, and effective deterrent for our Nation. If deterrence fails, our combat-ready force is prepared now to deliver a decisive response anywhere on the globe, across all domains, in coordination with geographic and global warfighting combatant commanders and our Allies and partners.

The Command is focused on integrating strategic deterrence in the 21st century, expanding the intellectual capital to educate the joint force on deterrence and nuclear policy, and ensuring our forces are prepared to meet challenges in the global security environment.

Our strategic forces provide the foundation and credibility that backstops all U.S. military operations and diplomacy around the world. Our triad remains the most effective way to deter adversaries from conducting strategic attacks against our Nation and our Allies and partners. Our Nation's strength has helped deter great power war and we must continue to prioritize the capabilities that underpin our strength.

Our Nation is at a critical point in maintaining our strategic advantages and must remain committed to modernization and recapitalization programs in place. Our strategic forces are a prudent investment in the current and future security of our Nation, with some systems scheduled to operate effectively well into the 2070s and 2080s. With continued Congressional support and budget stability, we can continue to pace the threat and develop the future force necessary to guarantee the continued execution of the Department's highest priority mission, to keep our Nation and our Allies safe.

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Document No. 3. The Importance of the Nuclear Triad (Office of the Secretary of Defense, Nuclear and Missile Defense Policy, November 2020).

> "The nuclear Triad has kept the peace since nuclear weapons were introduced and has sustained the test of time."
>
> *-- General Mark A. Milley*
> *Chairman of the Joint Chiefs of Staff*

The Triad Has Stood the Test of Time

For more than six decades, the United States has emphasized the need for a nuclear force that credibly deters adversaries, assures allies and partners, achieves U.S. objectives should deterrence fail, and hedges against uncertain threats. Since the 1960s, these objectives have been met by the U.S. nuclear Triad through forces operating at sea, on land, and in the air.

Today's nuclear Triad consists of:

- 14 ballistic missile submarines (SSBNs) armed with 240 submarine-launched ballistic missiles

- 400 land-based intercontinental ballistic missiles (ICBMs)
- 60 nuclear-capable heavy bomber aircraft capable of delivering gravity bombs and cruise missiles

These strategic forces are enabled by a secure nuclear command and control system and supplemented by a small number of non-strategic nuclear forces that provide an ability to forward-deploy.

Complementary Attributes for Robust Deterrence

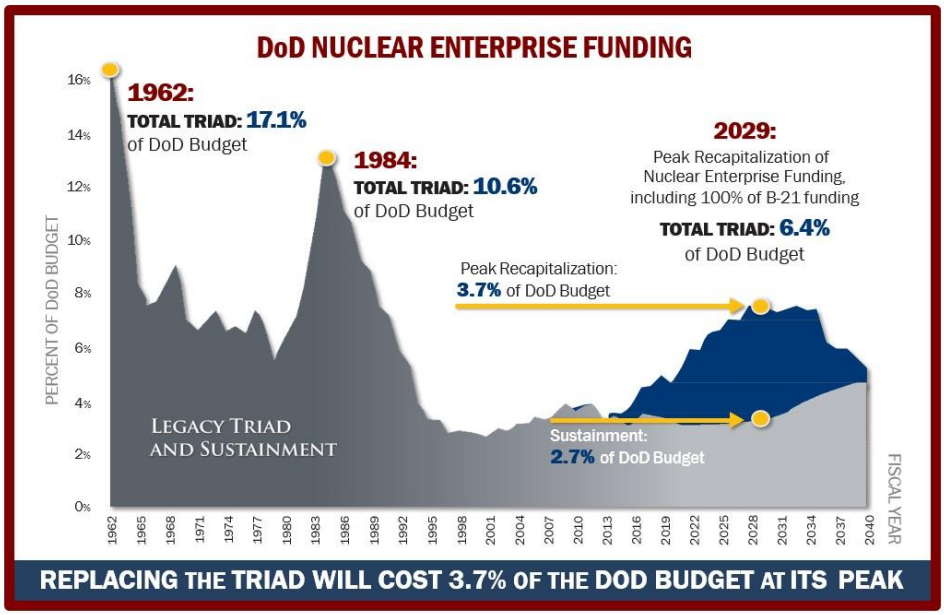
Each leg of the Triad provides unique and complementary attributes. Collectively, the Triad is intended to ensure that no adversary believes it could launch a strategic attack under any circumstances that eliminates the U.S. ability to respond and inflict unacceptable damage.

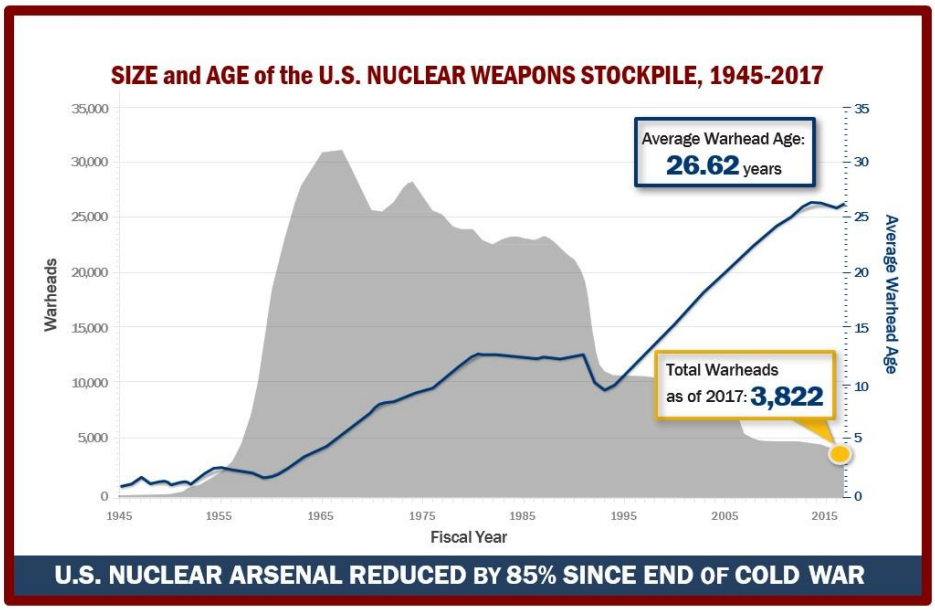
SSBNS ARE SURVIVABLE	ICBMS ARE RESPONSIVE	BOMBERS ARE FLEXIBLE
A portion of the SSBN fleet is always on patrol, making it very difficult for potential adversaries to track all of them, contributing to their survivability.	ICBMs are deployed in hundreds of silos and can be launched and reach targets within minutes, creating a nearly insurmountable targeting problem for adversaries.	Bombers are a clear and visible signal of U.S. intent and resolve during a crisis and provide a variety of deployment and yield options when placed on alert.

Eliminating a leg of the Triad would weaken the combined strength of the force and simplify adversary attack planning. For example, without ICBMs, a conventional-only attack on the limited number of submarine and bomber bases could significantly degrade the U.S. nuclear arsenal without rising to the level of nuclear use. This significantly lowers the threshold for an attack against the U.S. homeland. Also, the Triad's diversity enables mitigation of risk if a particular leg of the Triad is degraded or unavailable.

Most of the systems that compose the Triad are operating well beyond their original design lives—they must be modernized or they will be lost. With foreign nuclear threats growing, the importance of the Triad endures.

> "The Department will modernize the nuclear triad – including nuclear command, control, and communications, and supporting infrastructure. Modernization of the nuclear force includes developing options to counter competitors' coercive strategies, predicated on the threatened use of nuclear or strategic non-nuclear attacks."
>
> *-- 2018 National Defense Strategy*





*Latest publicly-available figures

First deployed in 1970, with an expected 10 year service life, Minuteman III (MM III) intercontinental ballistic missiles (ICBMs) have been operating for 50 years from bases deep in the American heartland. Having undergone multiple life extensions, the Minuteman III will

be replaced by a new, more survivable, and more cost-effective weapon system: the Ground Based Strategic Deterrent (GBSD).

Modernizing U.S. ICBMs

- After conducting an analysis of alternatives, the Air Force determined that a replacement ICBM would be similar in cost to a Minuteman III life extension program over FY2016-2075, would meet future requirements, and lower sustainment costs over its lifecycle.
- For the MM III to be usefully life extended, the United States would need to replace a number of major components – which, even if accomplished at cost and on time, would still fall short of the Department's requirements – including accommodating modern safety and security features and technologies.
- GBSD will incorporate low risk, technically mature components; feature a modular architecture that can incorporate emerging technology to adapt to rapidly evolving threat environments; and will be easier to maintain than the MM III – all of which will save on costs and provide great value as GBSD operates well into the 2070s.
- Finally, the GBSD program will not only replace the MM III missile, but also modernize the launch facilities, improve command and control, and increase safety and security.

The Importance of U.S. ICBMs

- U.S. ICBMs are the most responsive leg of the Triad, on day-to-day alert 24/7/365, and controlled by iron-clad nuclear command, control, and communications (NC3).
- U.S. ICBMs are spread out in 400 hardened, underground silos – with another 50 silos kept in "warm" status – assigned to three separate military bases, presenting an intractable targeting problem for any potential adversary.
- The hardened and dispersed nature of U.S. ICBMs requires a potential adversary to commit to a massive attack on the U.S. homeland to even have a chance of disabling all U.S. ICBMs – thus enhancing deterrence of an attack.
  - A massive first strike – when confirmed by multiple ground and space-based sensors – would send an unambiguous signal of the adversary's unlimited aims and virtually ensure massive U.S response.
  - 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.
  - While it is not U.S. policy to rely on launch under attack tactics, retaining this option forces the adversary to consider the likelihood its first strike could potentially result in 900 or more warheads being used on empty silos.

- Should the United States need to respond quickly to an emerging attack, U.S. ICBMs provide the most rapid response option with assured connectivity to the President through national command authorities.

- Although the MM III can carry up to three nuclear warheads, each is currently loaded with only one – providing the United States targeting flexibility, especially for some scenarios of an adversary's limited use.
- ICBMs also provide the ability to upload additional warheads which can hedge against technical failure in one of the other legs of the Triad or respond to adverse geopolitical developments.
- Finally, the day-to-day alert of ICBMs takes the burden of a daily alert posture off the bomber force – freeing up many bombers from continuous nuclear alert to concentrate on potential conventional missions.
  - Without U.S. ICBMs, more bombers would likely need to be purchased, beyond the number already planned, to maintain a secure nuclear strike capability while maintaining conventional roles.
  - At least some portion of the bomber force would then have to be placed on day-to-day alert to ensure survivability, which would reduce the serviceable lifetime of the airframe and add greater cost.

Answering Questions

Are U.S. ICBMs on "hair trigger" alert? Isn't this dangerous?

- No, the term "hair trigger" is misleading, meant to evoke an image of ICBMs dangerously close to being launched at the first sign of attack, without safeguards or oversight.
- 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.
- Although the President can order the launch of ICBMs quickly during an adversary's confirmed strike, the dispersed and survivable nature of the overall nuclear Triad, along with the redundant and secure nature of U.S. missile warning sensors, offers the President viable options to not rely on launch-under-attack tactics.

Does the United States have a launch-on-warning policy? What about false warnings of attack?

- No, the United States rejects launch-on-warning policies and postures and will not launch its ICBMs based only on one sensor's data.

- The United States maintains and is modernizing an overlapping network of space- and ground-based sensors that jointly validate the indications, and determine the severity, of a missile launch against the United States.
- The United States takes every precaution to ensure it does not rely on only one sensor's data for missile warning and assessment. Before a notification is sent to U.S. senior leadership, data concerning a potential missile attack are confirmed using dual-phenomenology – matching the data from both ground- and space-based sensors.
- The Department of Defense also 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.

Why can't we rely on submarines and bombers by themselves?

- A dyad of submarines and bombers alone would not provide sufficient deterrence and assurance effect.
- Without ICBMs, a conventional-only attack on the limited number of submarine and bomber bases could significantly degrade the U.S. nuclear arsenal without rising to the level of nuclear use. This significantly lowers the threshold for an attack against the U.S. homeland.
- Adversaries would have enormous incentives to invest even more in anti-submarine warfare capabilities while reinforcing their already substantial air and missile defenses.

Will the GBSD cause an arms race?

- No, Russia and China are already increasing the capability and number of their ICBMs respectively, while the United States is transparently replacing ICBMs on a one-for-one basis.
- Eliminating U.S. ICBMs unilaterally would in fact remove leverage from diplomats seeking to avoid an arms race and reduce the leverage needed to persuade other nations to decrease their nuclear arsenals.

Would eliminating ICBMs save a lot of money in the defense budget?

- No, even assuming a vastly reduced future defense budget, according to the Congressional Budget Office (CBO), eliminating ICBMs would account for less than one percent of the defense dollars spent over the next 30 years.
- Additionally, calls for eliminating ICBMs rarely account for the increased costs that would result.
- Eliminating ICBMs would only transfer the responsibility of nuclear deterrence and assurance missions onto the other legs of the nuclear Triad – bombers and submarines – which would require force posture and capability changes.

- These changes could potentially include procurement of additional submarines and bombers, and then placing bombers on strategic day-to-day alert to maintain current capabilities and effectiveness – both of which would increase costs.

The current Ohio-class ballistic missile submarines (SSBNs) began patrolling the world's oceans in 1982 and, although originally designed for a 30-year service life, have been life extended for a 42-year service life

- with the newest SSBN having entered service in 1997. Ohio-class SSBNs currently carry 20 Trident II D5 submarine-launched ballistic missiles (SLBMs). The Trident II D5 SLBM can carry multiple nuclear warheads and is used on both U.S. and U.K. nuclear-powered SSBNs. As the 14 Ohio-class SSBNs reach the end of their service lives, the U.S. Navy will replace them with the Columbia-class SSBNs, with the first patrol scheduled for 2030.

Modernizing Sea-Based Weapons

- Ohio-class SSBNs will serve longer than any other U.S. nuclear submarine.
- The United States will replace the 14 Ohio-class SSBNs with at least 12 Columbia-class SSBNs.
- The Columbia-class SSBNs will be able to carry 16 Trident II D5 SLBMs and feature a nuclear reactor that does not need to be refueled midlife – reducing operational and program costs while still meeting operational requirements.
- The Columbia-class SSBNs are designed to be survivable and operate well into the 2080s.
- The Trident II D5 SLBM fleet will operate into the 2040s.
- The United States has supplemented its sea-based nuclear capability with the W76-2 by modifying a small number of Trident II D5 nuclear warheads to provide a responsive and survivable low-yield capability to enhance deterrence.
- The Department of Defense plans to develop a nuclear-armed sea-launched cruise missile (SLCM-N) – providing a mobile, survivable, and dispersed capability for deterrence and assurance missions.
- The United States is also pursuing the W93 warhead to improve operational effectiveness and mitigate risk.

The Value of Sea-Based Weapons

Ballistic Missile Submarines

- SSBNs are the most survivable leg of the nuclear Triad because they are extremely difficult to detect while on deterrent patrol – with no foreseeable threats to their survivability in the near- to mid-term.
- Given their carrying capacity, SSBNs provide a range of nuclear response options that are available for a significant period of time while at sea.

- SSBNs are highly mobile, allowing them to move to a variety of launch points to avoid SLBM overflight concerns, increase operational flexibility, and provide assurance to allies.
- U.S. SSBNs maintain a continuous presence while at sea, with each SSBN often on patrol for months at a time, providing a reliable and responsive asset during an evolving crisis or conflict.
- U.S. SSBNs have reliable and redundant connectivity with the President through national command authorities.

Submarine-Launched Ballistic Missiles

- U.S. SLBM warheads are very accurate and reliable, and when combined with the Trident II D5's approximate +7,000 km range, allow the United States to hold at risk any adversary's hardened and valued assets.
- The Trident II D5's low-yield W76-2 warhead provides a prompt and survivable capability – a deterrent against any adversary's potential misperception regarding the possible gains from a limited or regional nuclear strike.

Nuclear-Armed Sea-Launched Cruise Missiles

- SLCM-Ns will be dispersed across a highly mobile force, posing an intractable targeting problem for adversaries, providing assurance to allies, and allowing the United States to surge forces during a crisis if needed.
- The maneuverability of the cruise missile launching platforms forces the adversary to plan against multiple azimuths of attack, stressing defensive planning.

Answering Questions

If SSBNs are very difficult to detect, why does the United States need 12? Can it reduce to eight?

- The primary mission of SSBNs is to deter strategic attack on the United States, its allies, and partners. To meet operational requirements and provide credible deterrence, U.S. SSBNs must maintain a high level of availability, survivability, and responsiveness that is only achievable with 12 SSBNs.
- Fewer than 12 SSBNs would limit our ability to meet operational requirements and conduct at-sea training, exercises, maintenance, and certification – including the operating of nuclear weapons, the nuclear reactor, and the submarine – all eroding U.S. credibility.
- Although SSBNs are indeed the most survivable leg of the nuclear Triad, the United States cannot assume that the current balance of technology will remain in the U.S. favor indefinitely.

- Reducing SSBNs to eight in number, for example, would greatly increase the strategic value of each individual submarine – increasing the incentives for adversaries to invest in anti-submarine warfare capabilities.
- A notional force posture of eight submarines, assuming the current level of nuclear warheads, would restrict targeting flexibility, reduce the size of the patrol area, and increase the predictability of submarine deployments and transit – reducing survivability.

Does the low-yield W76-2 warhead increase the risk of nuclear war by making it appear more usable?

- No, a nuclear weapon's yield is not determinative of its "usability" – any decision to employ nuclear weapons, even of the lowest yield, would be one of the most important decisions a President could make.
- The W76-2 is a limited and prudent modification of existing weapons – such adjustments do not increase the risk of nuclear war and, in fact, enhance deterrence by addressing a perceived gap in U.S. capabilities.
- A potential adversary must not perceive a gap between stated U.S. national interests, U.S. political will to defend those interests, and the appropriate U.S. capabilities needed and available to defend those interests.
- The W76-2's primary purpose is to deter, not fight, a nuclear war. Since the United States already has air-launched cruise missiles, what would SLCM-N add?
- The SLCM-N will provide a regional-based nuclear capability to deter strategic attacks, including an adversary's limited nuclear strikes – thus increasing the credibility of U.S. deterrence and assurance efforts.
- While air-launched cruise missiles stress an adversary's air defenses, U.S. sea-launched cruise missiles will stress the adversary's air defenses and naval forces that seek out the U.S. naval launch platform.

Is the United States trying to match Russia's non-strategic nuclear force, system by system?

- No, the United States does not see a need to match Russia's approximately 2,000 non-strategic nuclear weapons.
- Although the United States followed through on its commitments after the Cold War to retire sea-based nuclear cruise missiles from its forces, Russia did not follow suit and not only retained them, but modernized them.
- The Russian non-strategic nuclear force contains a number of systems that have no U.S. equivalent, including nuclear torpedoes, anti-ship missiles, depth charges, short-range ballistic missiles, and anti-aircraft missiles.
- Given this threat, the SLCM-N can fill a number of deterrence and assurance roles by broadening response options across a mobile and dispersed force, an important capability especially in regional crisis scenarios involving allies.

Why does the United States need the W93/Mk7? It already has two warheads for naval use.

- USSTRATCOM identified operational requirements for the W93/Mk7 to ensure the survivable, sea-based leg of the Triad can deter and survive against evolving threats in 2040 and beyond.
- The United States has not delivered an integrated nuclear reentry body system since the 1980s—required skills and industrial base have atrophied.
- The W93 warhead will not require nuclear testing or increase the size of the U.S. stockpile.
- The W93/Mk7 effort will also support our Ally, the United Kingdom, in their Replacement Warhead program.

The United States has a diverse set of air-based nuclear delivery systems – the B-52H heavy bomber, B-2 bomber, and the F-15E dual capable aircraft (DCA); as well as weapon systems– the air-launched cruise missile (ALCM), the B83-1, and the B61 family of gravity bombs. In the future the United States will deploy the B-21 Raider beginning in the mid-2020s; the nuclear-certified version of F-35 in 2024; the B61-12 in the 2020s; and the Long-Range Standoff Weapon (LRSO) in the early 2030s.

Modernizing Air-Based Nuclear Weapons

- The B-52H Stratofortress, originally deployed in 1961, has undergone a number of life extensions and upgrades, with the latest potential upgrade being an assessment of engine options and cybersecurity enhancements.
- The B-2 Spirit has been the Nation's only low-observable bomber since it was first deployed in 1997, and has received numerous software and hardware upgrades to remain capable in the most challenging environments.
- The B-21 Raider is a next generation low-observable bomber, scheduled to replace the B-2 beginning in the late 2020s, with a planned minimum inventory of 100 aircraft.
- The AGM-86B ALCM, which was first deployed in 1982, and designed to defeat Soviet threats, will be replaced by the LRSO – a low-observable, long-range, and survivable cruise missile.
- The B61-12 nuclear gravity bomb replaces four previous variants (Mods 3, 4, 7, and 10) – resulting in a single variant that balances greater accuracy and controlled yield– while meeting military requirements.
- The nuclear-certified F-35 DCA will gradually replace F-15E fighter aircraft as the primary dual-capable platform.

The Value of Air-Based Nuclear Weapons

- U.S. bombers are the most flexible leg of the Triad, allowing the United States to signal adversaries through force posturing – tangible reminders of U.S. commitments to its security and the security of its allies and partners.
- U.S. bombers have nearly unlimited range given their mid-air refueling capability, and, when combined with the range of their air-launched cruise missiles, can threaten a large percentage of targets in an adversary's territory.
- U.S. bombers can carry a number of nuclear and conventional weapons, tailored to the mission. These weapons can also be loaded or unloaded under condensed timelines, providing more flexibility than ICBMs or SLBMs.
- U.S. bombers and DCA can be forward deployed in allied or partner nations during peacetime, a crisis, or a conflict.
- Bombers can also be uploaded with additional weapons and/or placed on alert during a crisis as a deterrent signal.
- B61-12 and LRSO will have improved capabilities, accuracy, and reliability that will maintain their military effectiveness and reduce the probability of unintended consequences.
- The availability of low-yield options on the B61-12 and LRSO provides U.S. leadership better-tailored deterrence effects, flexibility in targeting, and less possibility of collateral damage.
- U.S. bombers and DCA are able to be recalled once airborne, unlike other components of the nuclear Triad, providing U.S. leadership more time for decision-making during an unfolding crisis.
- Air-launched cruise missiles greatly expand the capability of each individual bomber. For example, a single B-52 can carry 20 ALCMs, allowing one bomber to threaten 20 geographically separated targets.
- Advanced standoff weapons like the LRSO can impose significant costs on adversaries' air defenses, requiring large investments and advances in detection, tracking, C2, and area defenses to challenge a single LRSO.
  - Adversaries would have to detect both a low-observable bomber, if a B-21, and each low-observable LRSO.
  - Adversary investments in air and missile defense limit the amount of money they can invest in offensive forces.
- Without the LRSO, U.S. air-based nuclear deterrence capabilities would be significantly restricted, as delivery platforms would be forced to overfly each individual target – decreasing the probability of mission success and increasing the risk to aircrew safety.
- A significantly reduced U.S. bomber force could not credibly deter aggression nor assure allies and partners.

Answering Questions

With advances in potential adversaries' air defenses, are new bombers a worthwhile investment?

- Yes, the B-21 is designed to overcome even an advanced adversary's air defenses – but it is important to note that not all bomber missions will require direct penetration through the most concentrated air defense forces.
- Many of the B-21 bomber's prospective weapons will be able to launch at a standoff distance, allowing the bomber to either continue forward towards other targets or return safely for other missions.
- The B-21 will impose significant costs on potential adversaries, requiring significant investment in their integrated air and missile defense capabilities.

Why is the low-observable LRSO needed when the low-observable B-21 can carry gravity bombs?

- The LRSO's unique characteristics will augment the capabilities of nuclear gravity bombs, providing U.S. leadership with a broader range of options.
- While the B-21 will provide a significant capability improvement over other low-observable aircraft, the LRSO extends the range at which the United States can hold targets at risk within an adversary's territory – even when defended by modern integrated air defense systems.
- LRSO allows the B-21 to penetrate and launch the missile to fly the remainder of the mission, thereby denying an adversary geographic sanctuaries.
- If only carrying nuclear gravity bombs, a B-21 bomber would have to fly near or directly over each target. Whereas by employing LRSOs the B-21 could release multiple munitions at optimal points in the flight plan, allowing each cruise missile to maneuver and avoid air defenses. This enables one bomber to strike multiple targets while reducing time in or near an adversary's contested airspace.
- The deterrent effect of holding at risk what the adversary values both from standoff distance with cruise missiles or directly with gravity bombs is significantly greater than the deterrent effect of having only gravity bombs available.

Why can't conventional long-range cruise missiles substitute for the LRSO?

- While the operational effectiveness of LRSO in comparison to conventional cruise missiles is important, it is of secondary importance to the LRSO's primary purpose – deterrence – a purpose conventional cruise missiles can only supplement, not replace.
- The LRSO's greater range, low-observable signature, and nuclear yield will outpace any similar capabilities provided by conventional cruise missiles.
- In addition, if employed against hardened or mobile targets, the United States would need to launch far more conventional cruise missiles on more missions to – if possible – achieve the same likelihood of effectiveness.

If potential adversaries cannot determine whether a cruise missile is conventional or nuclear, will the LRSO increase the risk of nuclear war?

- No, the United States has deployed nuclear and conventional air-launched cruise missiles for decades.
- The United States has launched more than 350 conventional cruise missiles in combat since 1987, and none have been mischaracterized by potential adversaries as nuclear strikes.
- U.S. planning accounts for many possible adversary perceptions across a number of scenarios and seeks to minimize the chance of mischaracterization – including what weapons it employs, when, and for what targets.

Are bombers major contributors to the cost of the Department of Defense's nuclear modernization budget?

- No, the latest CBO projections estimate the total costs of bombers at around $40 billion over the next 10 years, averaging about four billion a year, or less than one percent of the entire annual defense budget.
- Of the four billion per year, however, CBO attributes only a quarter of the total cost to the nuclear mission.
- Even if U.S. bombers did not have a nuclear mission, the United States would still need to purchase the same number of bombers to accomplish conventional missions.

Dr. Colin S. Gray, *Understanding the Arms Race*, *Information Series* No. 125, September 1982 (Fairfax, VA: National Institute for Public Policy).

As Albert Wohlstetter[1] has argued, employment of the term arms race to characterize the Soviet-American military relationship of the past twenty years misleads as much as it informs. Hoverer, it is a fact that the world at large, with some justification, believes there to be, extant, a "nuclear arms race." In macroscopic terms, at least, this belief is not unreasonable.

- The United States and the Soviet Union have identified each other as their principal adversary.
- Each country is almost desperately attentive to the course, and detail of the arms programs of the other.
- Each country attends carefully to its relative position on the multi-level military balance.

These three facts do not qualify the Soviet-American military relationship as an arms race. Unfortunately, many of the pejorative connotations of "arms race" are all too lightly attached to Soviet- American military rivalry, notwithstanding the absence of supporting evidence.[2] Arms races tend to be associated, popularly, with the risk of war; they also tend to be viewed as an expensive exercise in futility (a particularly mindless mechanistic model of arms race dynamics still attracts a great many commentators).

Insofar as history offers any general wisdom on the subject, it is to the unhelpful effect that some wars have been preceded by arms races and some have not.[3] A fundamental theoretical problem that awaits scholarly attention pertains to the identification of cases. States which envisage the possibility of fighting one another, naturally and responsibly seek to achieve or maintain a favorable relationship of military power. Since political rivalry very often is expressed, in part, in military rivalry—and since wars tend not to occur between states who had not considered each other as prospective enemies until the eleventh hour of peacetime—some historical juxtaposition of arms race and war is only to be expected. Notwithstanding the empirical knowledge claimed, and the theoretical ingenuity displayed, the possibility remains that arms races are more the invention of polemical writers and social scientists in search of cross-historical general theory, than they are genuinely

[1] See His *Legends of the Arms Race*, USSI Report 75-1 (Washington, DC: U.S. Strategic Institute, 1975).

[2] See Jacek Kugler and A.F.K. Organski, with Daniel Fox, "Deterrence and he Arms Race: The Impotence of Power," *International Security*, Vol. 4, No. 4 (Spring 1980), pp. 105-31.

[3] See Theresa C. Smith, "Arms Race Instability and War," *The Journal of Conflict Resolution*, Vol. 24, No. 2 (June 1980), pp. 253-284.

identifiable event-sequences that do, or nay, have dynamics different from peacetime defense preparation as usual.

Heretical though the thought appears to be, it is worth considering the proposition that arms race theory has made so little progress in large part because the concept of an arms race is mainly metaphor. The confusion of metaphor and reality nay have encouraged Western arms controllers to seek what Robin Ranger has termed "technical," as opposed to "political"[4] arms control. Because arms controllers could conceive of an arms race system, to an important degree distinct from the framework of political relations, they came to believe that that system could be controlled in useful ways with only the most minimal reference to the political environment. Authoritative confirmation of this claim has been provided by Barry Blechman.

> The American theory of arms control would isolate such negotiations (SALT) from politics. In theoretical terms, arms limitation talks should be viewed as technical exercises, directed at constraining the risks which weapons themselves add to existing political conflicts. As those espousing arms control made no pretense of solving political conflicts through the negotiations they proposed, they saw no relationship (other than that artificially instilled by politicians) between progress or lack of progress in settling underlying sources of conflict and progress or lack of progress in arms negotiations.[5]

Blechman proceeds to notice that "[i]n practice, however, the United States has closely linked movement in arms control with broader political accommodations with the Soviet Union." Nonetheless, the practice of 11 linkage11 admitted,[6] the fact remains that the political roots of competitive arms behavior continue to escape the attention of American policy-makers. Where many theorists of arms racing, and many policy proponents masquerading as arms race theorists,[7] have erred, has been in focusing far too heavily upon the putative interactive traffic in the alleged arms race system. Indeed, the very concept of a largely autonomous arms race system encourages a quest for the military dynamics of military interaction.

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[4] Robin Ranger, Arms and Politics, *1958-1978: Arms Control in a Changing Political Context* (Toronto: Macmillan of Canada, 1979), particularly Chapter 1.

[5] Barry Blechman, "Do Negotiated Arms Limitations Have a Future?", *Foreign Affairs*, Vol. 59, No. 1 (Fall 1980), p. 105.

[6] See Gerard Smith, *Doubletalk: The Story of the First Strategic Arms Limitation Talks* (New York: Doubleday, 1980), pp. 25-26; Michael Mandelbaum, *The Nuclear Question: The United States and Nuclear Weapons*, 1946-1976 (New York: Cambridge University Press, 1979), pp. 199-200; and Henry Kissinger's prepared statement in U.S. Senate Committee on Foreign Relations, *The SALT II Treaty, Hearings*, Part 3, 96th Cong., 1st sess. (Washington, DC, USGPO, 1979), particularly pp. 171-173, 165.

[7] Arms race theory of the simple (and incorrect) action-reaction kind was deployed in 1968-70 to oppose ABM and MRV, just as it has been deployed of late to oppose MX/MPS. For example, not to the unexamined action-reaction premise which permeates Peter D. Zimmerman, "Will MX Solve the Problem?", *Arms Control Today*, Vol. 10, No. 1 (January 1980), pp. 7-9.

Scholars of Soviet-American relations tend to be ignorant of the precise historical detail of the process of genesis of a weapon system in the United States, and profoundly (and, by and large, excusably) ignorant with reference to Soviet program details. This is a subject where broad-brush characterization, deduced from first principles, can lead one astray all too easily.[8]

Consider the likely impact of the following first principles upon one's understanding of the dynamics of arms competition and the prospects for negotiated restraint:

- The defense programs of each side are, and can be, greatly influenced by perceptions of the other side's programs—actual, anticipated, and possible.
- Both sides would like to reduce the burden of resource allocation for defense.
- The larger, and more dynamic, the defense programs of the two sides, the greater the policy influence of defense-minded hard-line officials.
- Both sides would like to be able to negotiate a plateau in weaponry, or at least to be able to set some "cap on the arms race," so that strategic predictability is enhanced—permitting both governments to deny requests for programs that plainly would provide "excessive" capability. '

The above very short list encapsulates much of the theoretical, first-principle baggage with which the United States government conducted SALT and its end of the arms competition through much of the 1970s.[9] Each of the four principles was true—for *the United States*. None of the four principles was true, or contained enough truth to be useful as a guide for policy, vis 'a vis the Soviet Union. It is difficult to improve on the words of Sun Tzu:

> Know the enemy and know yourself; in a hundred battles you will never be in peril.
>
> When you are ignorant of the enemy but know yourself, your chances of winning or losing are equal.
>
> If ignorant both of your enemy and of yourself, you are certain in every battle to be in peril.[10]

To date, American policy-makers have not made adequate efforts to know the enemy, and even the level of American self-knowledge has left much to be desired. The arms race metaphor, aside from its unhelpful pejorative aspects, encourages scholars and officials to consider Soviet-American military relations apart from their local strategic-cultural soil.

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[8] I am grateful to my former colleague, Norman Friedman, for pointing out to me the many misassessments of alleged technical-strategic motives that Western naval analysts have (falsely) discerned with references to Soviet and American naval shipbuilding programs.

[9] See John Newhouse, *Cold Dawn: The Story of SALT* (New York: Holt, Rinehart and Winston, 1973); Thomas Wolfe, *The START Experience* (Cambridge, Mass.: Ballinger, 1979); Strobe Talbott, *Endgame: The Inside Story of SALT II* (New York: Harper and Row, 1970); and Smith, *Doubletalk*.

[10] Sun Tzu, *The Art of War* (trans. Samuel B. Griffith) (Oxford: Clarendon, 1963), p. 84.

Although this discussion is cast in terms highly critical of past United States nuclear-weapons and arms control policy, it should not be supposed that all, or even most, of the strong criticism of that policy (really policies) that has been voiced of recent years is any better grounded in strategic-cultural realities than is the policy assailed. Just as one should not leap, with fashion, from a simple-minded theory of detailed inter-state action-reaction to a scarcely less simple-minded theory of *eigendynamik*, so one should not leap to precipitously from the erstwhile belief that the Soviet Union was in the process of converging upon the American theory of strategic stability (through the maintenance of *mutual* assured destruction capabilities),[11] to the conviction that the Soviet Union is on the high road heading, deliberately, for the goal of clear strategic superiority. All sides of the American nuclear-weapon policy debate are prone to project very American perspectives and concepts upon an alien, though not unfathomable, Soviet strategic culture.

Questions which underlie analysis of the Soviet-American arms race are the following: is there a sufficient basis of common interest for an arms control process to be able to achieve outcomes deemed at least minimally useful by the two sides? Even if a sufficient basis of common interest can be identified, what, and how strong, are the domestic political forces in the two superpowers likely to interdict the arms control process in a negative way? Finally, is it plausible to suggest that the future of arms control is likely to be as unimpressive—or short of "tangible accomplishments"—as its past, because of the very character of the Soviet Union? (In other words, to control the arms race do we need, first, to see a major change in the nature of the Soviet polity?)[12]

What drives Soviet-American military rivalry? The answer, at the macro level, is an antagonism that is part geopolitical, part ideological; while at the micro level, Soviet defense programs are driven very substantially by their own inertia and by a distinctively Soviet brand of bureaucratic politics.[13] Each country runs, or jogs, in the so-called arms race in a fashion to be expected given its very different political system.

Arms race model builders tend to err because they have not, by and large, recognized the critical importance of the "level of analysis" problem. As a result, apparently strong—and certainly superficially plausible-cases can be made both for the proposition that the superpowers may be likened to two swordsmen, thrusting and parrying, and for the proposition that there is so high a degree of autonomy in the arms programs of each side that

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[11] See Thomas W. Wolfe, "The Convergence Issue and Soviet Strategic Policy," in *RAND 25th Anniversary Volume* (Santa Monica, Cal. RAND 1973), particularly p. 149.

[12] If this is judged to be the case, then one can only be pessimistic about the future of arms control.

[13] See Norman Friedman, "The Soviet Mobilization Base," *Air Force Magazine*, Vol. 62, No. 3 (March 1979), pp. 65-71. A work of enduring value is Matthew P. Gallagher and Karl F. Spielmann, Jr., *Soviet Decision-Making for Defense: A Critique of U.S. Perspectives on the Arms Rate* (New York: Praeger, 1972). Also see: Karl F. Spielmann, *Analyzing Soviet Strategic Arms Decisions* (Boulder, Colo.: Westview, 1978); and David Holloway, "Technology and Political Decision in Soviet Armaments Policy," *Journal of Peace Research*, No. 4 (1974), pp. 257-279.

the concept of an arms race is really very misleading. There is both value and error in all major schools of arms race analysis, so, rather than indulge in a protracted, essentially negative, exercises. in critical review, instead I offer the outline of a new model for the understanding of the arms competition. Perhaps the most difficult idea to communicate, though it is commonplace to pay lip-service to it, is that the two superpowers genuinely are different in their characteristic arms race behavior. Jonathan Steinberg, for example, has suggested that

> An arms race is, after all, an immense social, political, legal, and economic process. Its influences penetrate every corner of the societies involved, and its attendant manifestations are simply too complex to fit the standard categories of historical analysis. Even if the subject of study is only one of the participants in such a race, as is the case here [Imperial Germany], the number of elements in that nation's social, cultural, economic, and religious traditions which significantly affect the course of the arms race is very large.[14]

Anns race activity cannot be explained satisfactorily exclusively either in macro or in micro terms—both must be accommodated.

Elements of Theory

American understanding of the dynamics of the strategic arms race admittedly is rudimentary. Nonetheless, the past fifteen years have yielded some persuasive evidence.

- The Soviet defense establishment has moved in accordance with the quinquennial planning cycle established for all major economic endeavors. In short, the "Soviet war machine" lumbers rather than thrusts and parries in a nimble fashion.
- The Soviet defense effort, year in and year out, is moved much more by consideration of the overall level of the U.S. defense effort than by individual U.S. weapon programs.[15]
- There is an action-reaction mechanism in the arms competition, but it tends to operate at the macro, and very micro, levels, rather than at the level of particular major programs.[16]

In other words, major American defense budgetary shifts—*à la* Korea or, in minor key, even *à la* Reagan—eventually will be reflected in the level of Soviet defense allocations. Similarly,

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[14] Jonathan Steinberg, *Yesterday's Deterrent: Tirpitz and the Birth of the German Battle Fleet* (London: MacDonald, 1965), p. 28.

[15] See Colin S. Gray, *The Soviet-American Arms Race* (Farnborough, Hants, [U.K.]: Saxon House, D.C. Heath, 1976), Chapter 4.

[16] See Andrew W. Hull, "Action-Reaction," *United States Naval Institute Proceedings*, Vol. 197, No. 2 (February 1981), pp. 40-45.

Soviet forces do, and will, attempt to respond effectively, tactically, to the very specific threats posed by particular U.S. weapon systems.

There can be no question b.1t that there is an arms race, even if the United States has chosen only to jog while the Soviet Union has been running. Critics of particular U.S. weapon programs tend to take very little, if any, account of the detail of our extant arms race wisdom. They are content merely to cite the fact that this or that system should catalyze a major Soviet response. Analyses highly critical of MX, for example, tend to proceed from summary denunciation straight into the range of logical alternatives supposedly open to the U.S.S.R. by way of responses.

While it is necessary and desirable to specify what Soviet defense planners might do to counter an American weapon system, it is necessary and desirable also to identify the leading Soviet stylistic elements in the conduct of the strategic arms race. For example, regardless of developments in U.S. posture and doctrine, Soviet military science (following the very general guidance of Soviet doctrine, i.e., grand strategy) prescribes an "assured survival" approach to nuclear war. Individual American strategic weapon systems, be they the Safeguard ABM or the MX ICBM, are appraised in Soviet perspective in terms of their likelihood of actual deployment and their operational meaning.

Safeguard and its immediate technological successors was dealt with effectively by the Soviet Union via the ABM. Treaty of 1972. This treaty served Soviet strategic-operational purposes—quite aside from any broader political motivations—in that it closed off an avenue of overt military high-technology competition wherein the U.S.S.R. was close to a decade behind the United States.

It is more likely than not that Soviet defense planners were far less confident than were U.S. defense scientists from MIT and Cal. Tech. that they could assuredly suppress and/or penetrate *Safeguard*. Examined in historical perspective, it is quite obvious that Soviet strategic programs have been designed far more for the prospective positive accomplishment of enduring strategic missions, than they have for the purpose of offsetting, or negating, particular American capabilities.

Some American arms race theorists chose to deploy a simple action-reaction model of the arms race in order to demonstrate how- foolish it would be for the United States to deploy the *Safeguard* ABM. That opinion was proved correct in that the Soviet Union did choose to deploy strategic forces admirably well suited to defeat *Safeguard*, save only for the fact that *Safeguard* deployment effectively was aborted by the ABM Treaty of 1972. In retrospect, it appears to be the case that the doctrinal *leitmotiv* for Soviet strategic force development is a

determination to effect counterforce success.[17] *Safeguard* was not a threat to Soviet urban/ industrial targeting; rather was it a threat to hard-target counterforce planning. '

SALT agreements, to date (actual and proposed), simply have recorded the extant strategic nuclear balance. A major reason why that process was placed on diplomatic "hold" in 1980-81 was because its achievements were either very modest or even negative in American assessment.[18] The Reagan Administration will resume the SALT/START process in 1982, if only to accommodate NATO-European political pressures, but currently it lacks a plausible "theory of victory" in that process—pending the naturing of new weapon programs.[19]

As an instrument of arms race management, it is recognized officially today that SALT can only ratify what is, or what commonly is believed to be imminent. In short, there is no arms control alternative to strategic force planning for the alleviation of predictable arms race anxieties.[20] At root, the arms control processes of the 1970s (SALT and MBFR) foundered upon the fact that they were conducted on far too narrow a base of common interests.[21] Strategic doctrinal commonality was not required for arms control "success", but it is evident today that Soviet defense planners were not merely unpersuaded by Western theories of arms race and crisis stability; they were motivated, for good Russian/Soviet reasons, to pursue weapon deployments which actively would be subversive of the Western idea of stability. Yet again, and analogous with the political events of 1944-48, American policy-makers have been disciplined by the reality of Soviet behavior.

The twelve years, 1970-82, have seen American defense officials and commentators grope for a theory of arms race dynamics which would begin to fit the historical facts. It is known that the tight action-reaction theory propounded in the era of the "great ABM debate" (1969-70) is wrong, but what is right? The arms race (stability) arguments deployed to oppose *Safeguard* and MIRV plainly were largely devoid of merit—given the historical facts of Soviet strategic deployment 'behavior in the 1970s—so how does the strategic arms race "work"? It is useful to begin negatively: with explicit identification of propositions which have been shown by events to i.e., false. The following, incontestably, are not true:

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[17] John Erickson, "The Soviet Military System: Doctrine, Technology and 'Style'," in Erickson and E.J. Feuchtwanger, eds., *Soviet Military Power and Performance* (Hamden, Conn.: Archon, 1979), particularly pp. 24-32.

[18] On the current "crisis of arms control," see Blechman, "Do Negotiated Arms Limitations Have a Future?," pp. 102-25; Christoph Bertram "Rethinking Arms Control," *Foreign Affairs*, Vol. 59, No. 2 (Winter 1980/81), p. 352-65; and Richard Burt, "The Relevance of Arms Control in the 1980's," *Daedalus*, Vol. 110, No. 1 (Winter 181), pp. 159-77.

[19] See Colin S. Gray, "Wanted: An Arms Control Policy," *Arms Control Today*, Vol. 12, No. 2 (February 1982), pp. 1-2, 8-9.

[20]. This thesis pervades *Defense Planning and Arms Control*, Proceedings of a Special NSAI Conference, June 1980 (Washington, DC: National Security Affairs Institute, National Defense University, USGPO, 1980).

[21] See Donald G. Brennan and Colin S. Gray, *Common Interests and Arms Control*, HT-3218-P (Croton-on-Hudson, N.Y. Hudson Institute, August 1980).

- Soviet development and deployment of strategic weapons is driven by a determination to offset anticipated American counter-military prowess.
- Soviet strategic doctrine is dynamic and is open to innovative ideas bearing upon the strategic desirability of the preservation of a condition of mutual societal vulnerability.
- Soviet defense planners think systemically about the implications of their preferred strategic-force deployments for American decisions.

An observation made ten years ago by Johan Holst remains valid today: "We just do not have an adequate explanatory model for the Soviet-American arms race."[22] However, inadequate though the available explanatory models remain, the historical experience of Soviet strategic behavior in "the SALT era" of 1969-79 has yielded an evidential base for the derivation of propositions. These do not amount, as yet, to an "explanatory model," of the strategic arms race, but—in toto—they may merit ascription as promising pre-theory.

First, both superpowers develop and deploy weapons in accordance with the character of their separate national "strategic cultures."[23] In short, in the language of social science, the Soviet-American arms race is subsystem dominant. There is, in practice, no *general* rationality to strategic posture; instead there are separate rationalities, given the local details of culture and politics.[24] American strategic theory in the 1950s and 1960s tended to be long on somewhat abstract deduction and rather short on concrete inductive historical reasoning. Expressed in the vernacular, each superpower has "done its own thing," in individual character.

Second, the national strategic cultures of the United States and the U. S.S.R. are sufficiently distinctive that neither has understood, or been able to respond empathetically to, the concerns of the other.[25] While the United States has held to a *leitmotiv* of stability, defined in terms of the total mutual vulnerability of societies and the very substantial mutual invulnerability of strategic weapon systems, the U.S.S.R. has sought enhanced security through the unilateral ability to assure state and national survival by means of a multi-level capability to limit damage. In the authoritative American view, damage limitation in war will be a function of intra-war deterrence, of a reciprocation.in targeting restraint. In the Soviet view, damage limitation will be enforced physically by the timely destruction of U.S. strategic-force assets,

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[22] "Comparative U.S. and Soviet Deployments, Doctrines, and Arms Limitation," in Morton A. Kaplan, ed., *SALT: Problems and Prospects* (Morristown, N.J.: General Learning Press, 1973), p. 68.

[23] See Jack L. Snyder, *The Soviet Strategic Culture: Implications for Limited Nuclear Operations*, R-2154-AF (Santa Monica, Cal.: RAND, September 1977).

[24] For example, see Desmond Ball, *Politics and Force Levels: The Strategic Missile Program of the Kennedy Administration* (Berkeley: University of California Press, 1980).

[25] See Colin S. Gray, *Nuclear Strategy and National Style*, HI-3362-PR (Croton-on-Hudson, N.Y.: Hudson Institute, June 1981).

the disruption and destruction of U.S. command and control, and the physical protection of essential Soviet state values.

Third, it is "the Soviet wav" to maintain very large armed forces which express as well as enforce the will of the state, and to seek whatever degree of military preponderance foreign competitors permit (or cannot prevent). As a continental Great Power, with vulnerable frontiers and geographically proximate enemies, the Soviet Union is the historical heir to a tradition of military prudence that is fundamentally alien to such insular powers as Great Britain or the United States.

Fourth, stability on the home front is a cardinal tenet of Soviet 12 military doctrine. Soviet military programs are not turned on and off as theoretical whim or immediate political expediency appears to suggest to be desirable. The U.S.S.R. is a country governed economically on a five-year planning cycle. The action and reaction implied in some arms race theorizing implies an ability and a willingness to fine-tune weapon research, development and deployment in response to signals received from the arms race system. The Soviet economy does not function like that. Socialist planners are committed to the idea of full employment—and that includes weapon design bureaus and the manufacturing industrial sector which produces bombers, ICBMs end SSBNs.[26]

Fifth, the Soviet-American arms race is driven, at root, by the political antagonism which divides the two states. With reference to the founding political dogma, which rationalizes the very "right to rule" of the CPSU, Soviet leaders define the United States as an enemy. Aside from ideology, geopolitics or *realpolitik* informs Soviet leaders that the United States is the principal external energy capable at present of denying the Soviet Union control, or *contrôle*,[27] over the whole of Eurasia- Africa. The more advantageous the multi-level East-West military balance is in the Soviet favor, the greater the political freedom of action enjoyed by Soviet leaders.[28]

Sixth, Soviet foreign policy—and the military capability which supports it—is a captive of the "dynamics of empire."[29] Soviet political power must expand, as logically must the military capability supporting it, because the Soviet government is the insecure suzerain of an empire

[26] On this subject see Arthur J. Alexander, *Decision-Making in Soviet Weapons Procurement, Adelphi Papers*, Nos. 147-148 (London, IISS, Winter 1978/9).

[27] The French *contrôle* means general supervision, by way of some contrast to the more rigorous implications of the English word control.

[28] See Benjamin S. Lambeth, "The Political Potential of Soviet Equivalence," *International Security*, Vol. 4, No. 2 (Fall 1979), pp. 22-39; and Dimitri K. Simes, "Deterrence and Coercion in Soviet Policy," *International Security*, Vol. 5, No. 3 (Winter 1980/81).

[29] See Colin S. Gray, "The Most Dangerous Decade: Historic Mission, Legitimacy, and Dynamics of the Soviet Empire in the 1980s," *Orbis*, Vol. 25, No. 1 (Spring 1981), pp. 13-28; and Rebecca V. Strode and Colin S. Gray, "The Imperial Dimension of Soviet Military Power," *Problems of Communism*, Vol. XXX, No. 6 (November-December 1981), pp. 1-15.

wherein every "holding" depends upon every other "holding". The Great Russian core area of Muscovy and Byelorussia is protected (and threatened) by nearly four centuries of imperial land grabbing which, in its turn after 1945, has come to be protected in the West by the Eastern European marches of East Germany, Poland, Hungary, Czechoslovakia, Romania and Bulgaria. The outermost fringes of empire (be it Roman, British, French or Russian/Soviet) are always threatened by states or tribes beyond the imperial frontiers. In short, Soviet power at hone is not secure without control of Eastern Europe; and control of Eastern Europe is not secure without control, or perhaps *contrôle*, of Western Europe. If this imperial argument is true, it tears a very cautionary tale for those in the West who seek to establish an East-West military relationship guided by some rough facsimile of the concept of strategic stability.

Seventh, the United States has never had a settled arms-race strategy: the U.S. has functioned almost as a "wild card" in the competition. The United States, on the historical evidence of 1945-82, has surged its defense effort in response to particular sequences of "security shocks" (the invasion of South Korea in 1950; the "missile gap" of 1957~61; and, most recently, the invasion of Afghanistan in December 1979), and then has coasted on the budgetary surfeit temporarily provided until the next "shock" galvanizes a popular political reaction which cannot be denied. To date, it is accurate to claim that the American people have never been told that the Soviet Union poses, prospectively, a *permanent* problem. While the U.S. coasts and surges, and coasts again, the U.S.S.R. pursues its defense program business in a near steady-state mode.

Eighth, turning, or decision, points in the strategic arms race are political rather than military-technical. The across-the-board improvement in Soviet military capability is impressive when assessed in a long-term cumulative vein (i.e, in 1982 as opposed to 1972), not when assessed year to year.[30] The Soviet arms race challenge is assayed by the United States in political, not military, terms. The electorates of democracies tend not to be moved by annual military briefings which explain that the Soviet Union is doing better this year that which she was doing last year. Democracies, at the level of public opinion and pressure on policymakers, are moved by dramatic political events.

Ninth, the quality of arms-race systemic sensitivity between the superpowers is low. Given that a genuinely new strategic weapon technology tends to require a canonical five-to-ten year period to progress from drawing board to silo, submarine, or airfield, it is scarcely surprising that the agile thrust and parry of the archtypical liberal arms race theorist is not well represented in the annals of the Soviet-American arms race. Quite aside from the truly major problems of domestic doctrinal-bureaucratic-industrial inertia confronted by both superpowers, there remains the significant difficulty of the moving target. In other words,

[30] See John Collins, *U.S. Soviet Military Balance: Concepts and Capabilities, 1960-1980* (New York: McGraw-Hill, 1980).

the Soviet, or American, strategic program which I plan to confound may not actually exist, or exist in anything close to operational detail, for the better part of ten years. For example, pity the poor Soviets in 1980-82. The Main Operations Directorate of the General Staff wishes to suggest the optimum means for countering U.S. MX ICEM deployment, but the protracted indecision .in the U.S. defense community has denied the General Staff a fixed target. Even if each side wanted to, and was capable of fine-tuned arms-race thrusting and parrying, the tec1mical-industrial reality of extended lead-tines would frustrate that endeavor.

The nine propositions specified above have, *in toto*, major implications for the arms race consequences of particular weapon systems. All too often, opponents of a weapon posit an American-style Soviet arms race opponent who is willing and able rapidly to shift defense preparation gears in order to pose a total threat to it.

The Action-Reaction Hypothesis

Arms-race analysis in the West continues to be afflicted by theorists seeking to identify patterns of arms-program interaction. It is my contention that, although each superpower has sought to be responsive in a broad and general way to trends in the evolution of the military capabilities of its principal rival, there has been very little detailed action and reaction. Because of the near-total absence of direct evidence on the motives behind individual Soviet·weapon programs, this author and the scholars who he is criticizing, are driven, more often than not, to argue by technical inference.

While it would probably be an error to assert that Soviet defense programs are insensitive to perceived and anticipated threats, the historical facts of the period 1964-1982 (the Brezhnev leadership period, to date) suggest that a claim for the very substantial autonomy of the Soviet defense effort (*vis à vis* changes in the level of the American defense effort) is unlikely to be far off the mark. In that extensive period, the rate of increase in the level of the Soviet defense effort roughly coincided with t h e rate of increase in the growth of the soviet economy.[31] It is possible to argue that the absolute decline in the level of the American defense effort (until quite recently) has encouraged the Soviet Union to compete more vigorously, but that argument lacks for evidence in its support—notwithstanding both its logical appeal, and its apparent fit with the facts. In Harold Brown's words:

[31] At least as averaged over the years. Typically, as best we can judge, the Soviet defense effort in the Brezhnev period has registered roughly a 4 percent rate of real growth each year. Such a rate was somewhat below the rate of growth in Soviet GNP in the better years of the 1960s, is somewhat above the rate of growth of the late 1970s, and is *well above* the expected rate of growth of Soviet GNP in the early to mid-1980s. As the Soviet Union enters a period of rate of economic growth averaging, say, 2-2½ percent *per annum*, unless one is willing to predict a Soviet willingness to contract the scale of its military programs, then one has to conclude that the expectations, if not the actual living standards, of the Soviet consumer will have to suffer.

> As our defense budgets have risen, the Soviets have increased their defense budget. As our defense budgets have gone down, their defense budgets have increased again.[32]

In short, the rest two decades offer a happy playground for statisticians eager to establish positive and negative correlations. In practice, as is known from American weapon program histories, much of the detail of a particular program is negotiated for reasons, and to conclusions, that have little or nothing to do with the anticipation of external threat. President Carter's MX, multiple protective structure (MPS) system, for example, with its "baseline" configuration of 200 MX missiles and 4600 shelters, certainly was defensible—and indeed, had to be defended—in terms of the Soviet threat, but the Soviet threat did not drive the determination of the basic parameters of the system. The figure of 200 MX ICEMs was a compromise number negotiated between the Air Force and Senator Macintyre of the Senate Amed Services Committee. The Senator was opposed to a force size too obviously capable of posing a credible first-strike threat to Soviet silo-based ICBM.[33]

Because the lead-tine for a major strategic weapon system is on the order of ten years (or longer—to full operational capability [FOC], neither superpower can act and react in the mechanical, deft manner suggested by some arms control theorists. In other words, so many are the technical, budgetary, political, and (in the Unites States' case) even basic doctrinal hazards facing a weapon program over its very long gestation period, that it simply is not possible to react to Soviet offensive or defensive developments. How could the United States, in 1982, react with a new weapon program to a Soviet weapon program anticipated for the period 1990-2000?[34]

Aside from the truly major uncertainties of strategic intelligence predictions for a decade hence—the lead-time pertinent to major weapon program evolution—each party to the arms competition has unique foreign policy duties to perform, very individual strategic preferences to express (in weaponry and C3I), and very particular domestic-process considerations to accommodate. In short, American officials and extra-official commentators cannot sensibly support or oppose a particular weapon program, be it MX, LoADS or whatever, on the grounds "that the Soviet Union will respond as follows..."[35]

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[32] *Department of Defense Annual Report, Fiscal Year 1980* (Washington, DC: USGPO, January 25, 1979), p. 6.

[33] For a comprehensive study of the MX/MPS program, See Colin S. Gray, *The MX ICBM and National Security* (New York: Praeger, 1981).

[34] For several years it has been argued that the U.S. cruise missile program would drive the U.S.S.R. to a massively expensive, offsetting air defense deployment. While the Soviet Union undoubtedly will endeavor to optimize its tactical efficacy against the cruise missile threat, U.S. officials tended to neglect to point out that the Soviet Union has long been committed to the orderly modernization of a massive air defense capability and that the scale of Soviet resource allocation to PVO-Strany is probably close to unaffected by predictions of the fate of individual U.S. weapon programs.

[35] In 1980, Admiral Turner, the Director of Central Intelligence, waged a campaign, via the national intelligence estimates, to dissuade the president from continuing with MX/MPS. The CIA, allegedly, predicted

Close study of such Soviet evidence as there is available suggests that the Soviet Union strives to achieve maximum prospective combat effectiveness (in the interest of proletarian internationalism, deterrence, and plain common sense), but that also it is devoted to the preservation of stability on the home military-industry front. Major changes in resource allocation for defense *vis à vis* non-defense programs, or even between defense programs, are very expensive in the Soviet system. An economy centrally planned on a series of five-year cycles is not the most agile of vehicles for the conduct of an arms competition supposedly characterized by an action-reaction process. The more that is learned of Soviet defense industry, and that remains all too little, the less convincing becomes the image of a Soviet defense establishment willing and able to conduct a process of deft thrusts and parries in the strategic arms con-petition. One should be prepared to believe that the Soviet defense system, writ large, is capable of "lurching" in step-level jumps, given sufficient notice. In other words, should an American administration decide to raise the level of American defense expenditure by, say, fifty or one hundred percent, one should expect the Soviet defense machine to react. However, one should not expect the Soviet defense machine to react directly, in detail to the new United States' defense program, and neither should one assume that the Soviet Union necessarily could react—even in a gross fashion—as some action-reaction theorists tend to imply. It is not obvious that the Soviet Union could much increase the output of its high-technology industry for defense functions.[36]

A Soviet Union devoted to the improvement in its military condition at all levels easily lends itself to misassessment by Western theorists. Where Western theorists are inclined, by strategic culture, to see purposeful design, one should perhaps see only prudence (defined in Soviet terms). Benjamin Lambeth has offered the relevant thought that

> [i]t would probably not be overly facetious to suggest that for Soviet military planners, the favored measure of strategic sufficiency is the notion that "too much is not enough".[37]

The Soviet Union has not imposed a condition of strategic inferiority on the United States. Such a condition, if it exists,[38] is the product of steady momentum, or perhaps just inertia, in

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a Soviet "response" to MX/MPS at the high end of the possible threat range, surprising well in excess of 20,000 ICPM warheads. The basis for this estimate range was, very largely, (CIA) strategic logic—it was not Soviet evidence. See Richard Burt, "Soviet Nuclear Edge in Mid-80s Is Envisioned by U.S. Intelligence," *The New York Times*, May 13, 1980, p. Al2.

[36] It is only fair to point out that the U.S. defense community is divided in its assessment of Soviet mobilization potential *vis à vis* defense high technology. A useful discussion is Abraham S. Becker, "On the Politics and Economics of the Burden of Soviet Defense," unpublish paper (RAND), May 1980.

[37] Benjamin Lambeth, *How to Think About Soviet Military Doctrine*, P-5939 (Santa Monica, Cal.: RAND, February 1978), p. 7.

[38] The strategic balance is notoriously difficult to measure. Today, and for the next several years, I do not believe that the United States could wage acute crises or wars with the U.S. S. R. and secure her foreign policy goals. This has to translate into strategic inferiority—"soft" though the reasoning admittedly has to be. There

Soviet weapon programs, and an enduring deficiency in American attendance upon its strategic-force survival problems. The current crisis in the survivability of the American ICBM force is not the result of a dramatic Soviet arms race challenge, nor need it be read as clear evidence signifying Soviet determination to achieve strategic superiority. Indeed, even to frame the problem in that way probably is to impose a very un-Soviet mode of thinking upon the Soviet defense establishment.[39]

Believing that war can occur, and that the quantity and quality of defense preparation (considered expansively) can make the difference between victory .and defeat, but all the while hoping that a direct military clash with the United States can be avoided,[40] the Soviet Union has pursued an orderly, affordable, program of military modernization across the board of capabilities. Soviet effort with respect to strategic offensive forces has been extraordinary in relation to other military programs, a fact which may be explained by reference to the comparative disadvantage of the U.S.S.R. in high-technology defense research, development, and production, and to the extraordinary significance of strategic nuclear weapon systems in the structure of Western strategy.[41] While Western analysts may well overprice some of the more manpower-intensive military capabilities of the U.S.S.R., they almost certainly underprice Soviet strategic-nuclear programs.[42]

As an arms race participant, the Soviet Union appears not to be racing to achieve any particular relationship of power, unless an appreciation of the political and military benefits of a growing (though necessarily fragile) preponderance may be so characterized. The Soviet Union, driven both by paranoid fears and by the general belief that coercive power is always useful, can never be satisfied that it has "enough" or "sufficient" military power. In a very dogged, steady, manner—the Soviet defense establishment makes, by and large, marginal improvements in its capabilities, year after year.[43] Insofar as can be discerned it is not performing at all consciously in a particular pattern of action and reaction (of any kind). The enemy is clearly identified, Soviet military science provides a stability of guidance for strategic direction, so—undramatically—the Soviet Union improves its ability to wage war,

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is no magic metric or yardstick which can inform the U.S. defense community as to whether or not its programs are sufficient.

[39] It is far from obvious that the U.S.S.R. recognizes a concept of strategic superiority outside the enveloping framework of the correlation of forces. See Seweryn Bialer, *Stalin's Successors: Leadership, Stability, and Change in the Soviet Union* (New York: Cambridge University Press, 1980), pp. 241-253.

[40] In Paul Nitze's words: "The Kremlin leaders do not want war; they want the world." "Strategy in the Decade of the 1980s," *Foreign Affairs*, Vol. 59, No. 1 (Fall 1980), p. 90.

[41] See Henry Kissinger, "The Future of NATO," *The Washington Quarterly*, Vol. 2, No. 4 (Autumn, 1970), p. 6

[42]. And perhaps not only strategic-nuclear programs. ZSU-23-4 anti-aircraft and guns and BMP infantry combat vehicles also have been judged to be relatively more expensive for the Soviet Union than the U.S. (with reference to U.S. counterparts) to produce. See Collins, *U.S.-Soviet Military Balance: Concepts and Capabilities, 1960-1980*, p. 83.

[43] The U.S.S.R. has provided, and is providing, a near-classical illustration of this thesis with its year by year improvement in what, generically, is termed the fourth generation of its ICBMs.

and hence enforce a deterrent condition, year by year. The fragility to which brief reference was made parenthetically above, lies in the inherent, structural limitations of Soviet high-technology industry. Soviet officials know very well that they could not win or even sustain a rough parity in a high-technology arms competition with the United States. In other words, although American carelessness may have yielded them an advantage in the central nuclear balance, narrowly defined, in the 1980s, they cannot—and probably do not—expect that carelessness to continue for much longer.

The model of the arms competition implicit in the above discussion should have an impact upon Western debate over arms control policy. To summarize, the Soviet arms-race/arms-control adversary-partner has the following essential characteristics:

- A total, though long-term, commitment to the demise of Western governments. Detente, or even near-entente (as in the current phase of Sino-American relations), has to be solely a matter of tactical convenience.
- Both a geopolitical (*realpolitik*) and an ideological antipathy to the "maritime alliance" which continues to deny it a total imperium over Eurasia.
- A very Russian, and certainly non-Western (and even premodern), suspicion of foreign ideas and, indeed, of any alien elements that are not controlled by Moscow.
- A commitment, born of historical understanding and ideology, to global instability (in Western terms). Relationships of power and influence are not stable, they are dynamic, and the Soviet Union/Russia has learned at first hand what apparent weakness can cost.
- A commitment to offer the most effective defense feasible should war occur. Soviet defense programs are not guided, or inhibited, by any consideration of strategic stability that would be familiar to Western theorists.
- A stable doctrine, a stable strategy, and a commitment to orderly, stable, defense programs. This is not to deny the probable fact of inter-service rivalry having a biasing effect upon the evolution of quite broad categories of Soviet defense capabilities (for example, consider the shifting fortunes of Soviet Long Range Aviation), but it is to suggest that the Soviet defense effort, as a whole, is not an instrument capable of playing new tunes on little notice.

Interaction between Soviet and American defense capabilities tends, therefore: to be intermittent and necessarily somewhat broad in its effects at the higher levels of policy direction; to be all but absent at the level of particular major program development (the region classically assumed to be driven by a tight pattern of action-reaction); and to be quite intensive at the sharp end of (tactical) operating detail. Consideration of the evolution of weapon programs from the early 1900s to the present day suggests a surprising degree of autonomy in national rationales. Whether it be with respect to *Dreadnoughts* and *Super-Dreadnoughts* prior to 1914, or to ABM, MIRV and MX in the 1960s and 1970s, the evidence

(pertaining to the real detail of program genesis and evolution—as opposed to inferred strategic logic) of patterns of program interaction is, to be polite, extremely thin.

Conclusions

The argument presented immediately above may have major implications for United States' weapon programs and arms control policies, because· arms race stability is prominent among the defense and arms control objectives of the United States. Western theories of arms race stability posit a presumed relationship between "what we do" and how we anticipate the adversary to react. Most of the Western theoretical literature on arms race stability, because it does not rest upon a robust understanding of what drives the race, must simply be discarded.

The U.S.S.R. is committed irrevocably, by its basic character, to permanent struggle. The U.S.S.R. cannot become just another, though a rather unusually powerful, authoritarian state. The past and present sacrifices of the Soviet peoples have to be justified in terms of a historic mission. Not merely does the U.S.S.R. need a foreign enemy, but the ideology that legitimizes the Soviet state very conveniently identifies such an enemy. The only choice open to the United States is whether or not she will compete effectively with the U.S.S.R. There can be no peaceful settlement of basic differences with the Soviet state—a detente process can have no foreseeable end point of that kind. The arms race must continue until either the U.S.S.R. suffers domestic revolutionary change of a character ultimately benign to the security condition of others, or until there is a military decision between East and West. This is hardly pleasant news, and it is scarcely surprising that prominent American politicians have not shared this insight with their electorate. The relevance of this argument to the study is the long-term, really inalienable, nature of the problem to which it points. The roots and sustaining fuel of the Soviet-American arms race do not lie so much in the separate, very complex "domestic processes" which can be explored in detail by scholars of the bureaucratic-politics or Military-Industrial Complex (MIC) persuasion, rather do they lie in the particular political character of Soviet state power and in the facts of geopolitics.