LAWRENCE
LIVERMORE
NATIONAL
LABORATORY

LLNL-TR-753807

Deterring Limited Nuclear War in the 21st Centruy: The Challenge for the United States

J. Warden

June 27, 2018

Disclaimer

This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Limited Nuclear War: The 21st Century Challenge for the United States

JOHN K. WARDEN

Livermore Papers on Global Security No. 4
Lawrence Livermore National Laboratory
Center for Global Security Research
July 2018

Livermore Papers on Global Security

 # 1 Lewis Dunn, *Redefining the U.S. Agenda for Nuclear Disarmament* (2016)

 # 2 Yukio Satoh, *U.S. Extended Deterrence and Japan's Security* (2017)

 # 3 Dave Johnson, *Russia's Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds* (2018)

Available in hard copy from CGSR or download at cgsr.llnl.gov

Limited Nuclear War: The 21st Century Challenge for the United States

JOHN K. WARDEN

Livermore Papers on Global Security No. 4
Lawrence Livermore National Laboratory
Center for Global Security Research
July 2018

Table of Contents

Author's Biography

John K. Warden is a U.S. defense policy and strategy analyst based in Washington, DC. He focuses on deterrence and escalation, nuclear weapons and operations, U.S. alliances, and related issues. Mr. Warden previously worked at Science Applications International Corporation (SAIC), the Pacific Forum, and the Center for Strategic and International Studies (CSIS) and is the author or coauthor of many articles and reports on defense and foreign policy that have been published in *The National Interest, Proliferation Papers, Survival, The Texas National Security Review, The Washington Quarterly*, and *War on the Rocks*. Mr. Warden holds an M.A. in security studies from Georgetown University and a B.A. in political science and history from Northwestern University.

The author is grateful to reviewers of this paper, including Paul Bernstein, Margaret Davis, Jacek Durkalec, Matt Hallex, Jeff Larsen, Austin Long, Aaron Miles, Jonathan Pearl, Brad Roberts, Bruce Sugden, and Vic Utgoff. He alone is responsible for the views expressed herein.

Preface

After decades of nuclear competition, the United States and Soviet Union were able to come together in 1986 around the proposition that nuclear wars cannot be won and thus must not be fought. Decades after the Cold War, policymakers and experts in the United States continue to hold this view. But in the capitals of potential adversary countries, a different proposition appears to be taking hold: that nuclear wars can be won because they can be kept limited, and thus can be fought—even against the United States. The evidence in support of this proposition is the investment that Russia, China, and North Korea have made in developing the operational concepts, military doctrine, and nuclear capabilities for waging nuclear war at the regional level of war, while also keeping their nuclear powder dry (to paraphrase President Putin) at the strategic level to deter escalation there.

What can be done to restore their view that any step across the nuclear threshold would be a catastrophe for them? Part of the answer is to strip away their confidence that any such war would be kept limited. Toward this end, the United States and its allies must return to one of the most uncomfortable topics of the Cold War: limited nuclear war. The topic is difficult in part because it implies the nuclear taboo could be broken without major consequence. And it is uncomfortable because it implies to U.S. allies that they alone might bear the costs of a war fought on their territory by two outside powers. Moreover, it requires that experts and policymakers in Washington and allied capitals return to the topic of extended deterrence and examine how best to make it credible and effective in the current security environment.

Difficult though it may be, the new problem of limited nuclear war requires some answer from the United States and its allies. If potential U.S. adversaries believe that they can fight and win a limited nuclear war, then the existing world order is likely to change in fundamental ways, either because they put their beliefs to the test and create a catastrophe of historic proportions, or because the failure of the United States to find a meaningful answer will lead U.S. allies to find their own answers and an independent path from the United States.

To help reorient policymakers and experts to the new problem, a

fresh analytical start is needed. The problem of limited nuclear war must be understood as it exists in the current security environment, not as it was earlier. Toward this end, John Warden provides a crisp and compelling introduction, one that links past and present in clear conceptual terms. He then goes on to explore implications for the United States and its allies. This analysis focuses on strategy, rather than capabilities, and in this sense is directly relevant to the emerging policy debate about how best to ensure that extended deterrence remains credible and effective in the new security environment. His recommendations about how to tailor deterrence to meet the new challenges of limited nuclear war deserve broad attention and discussion.

Brad Roberts
Director
Center for Global Security Research
June 2018

Introduction

For the first time since the end of the Cold War, the U.S. ability to fight and win wars at the time and place of an adversary's choosing is now in question.[1] Russia, China, and North Korea are developing military concepts and capabilities that may challenge the free, rules-based orders in Europe and Asia while making it exceedingly difficult and costly for the United States to intervene in defense of allies. Besides upgrading conventional forces, U.S. adversaries have been strengthening their ability to threaten or use nuclear weapons in conventional conflicts.[2] Indeed, the greater the conventional advantage of the United States, the greater the incentive for adversaries to incorporate nuclear weapons into their revisionist strategies.

Ensuring that potential adversaries do not challenge the interests of U.S. allies via military coercion or conquest is a critical aim of U.S. national security. North Atlantic Treaty Organization (NATO) members in Europe, Australia, Japan, South Korea, and other Asian states help promote U.S. political, economic, and security interests.[3] In committing to the defense of its allies, the United States helps deter would-be aggressors from attempting to forcibly alter political, territorial, and security arrangements in Europe and Asia. These commitments have encouraged many allies to forgo pursuing their own nuclear-weapons capabilities.

From an adversary's perspective, the basic logic of nuclear escalation in a regional conflict is clear. Under a credible specter of escalating nuclear war, the United States must reconsider whether defending an ally is worth the potentially catastrophic cost, and may decide it is not. Yet the adversary would also have to recognize that nuclear escalation is extremely risky. Crossing the nuclear threshold would contravene a long-standing tradition of nonuse of nuclear weapons and invite U.S. nuclear retaliation.

The U.S. defense community has given insufficient thought to how an adversary might ultimately balance the potential benefits of nuclear escalation and the risks. In many cases, the possibility of adversary limited nuclear use is dismissed out of hand as preposterous, often because of misguided mirror imaging. As James Wirtz warns, "American analysts, planners, and policymakers… tend to project their own estimates of the utility of nuclear use and the likelihood of nuclear war based on their own judgments about the limited desirability of introducing nuclear weapons into a conflict."[4]

But even among strategists who seriously consider adversary nuclear employment, the discussion tends to revolve around variations on a common vignette: an adversary begins to lose a conventional conflict and resorts to nuclear weapons in an attempt to coerce the United States and its allies into backing down. The United States must decide how to respond, including whether to retaliate with a nuclear strike. This scenario is plausible in today's world and should be pondered—but it relies on assumptions about the circumstances that might trigger the use of nuclear weapons, what the adversary seeks to accomplish via employment, and how the adversary might plan to control escalation. These assumptions must be critically examined.

This monograph explores the key factors that would incentivize or discourage Russia, China, and North Korea from using nuclear weapons in a regional conflict. A number of related questions are considered:

- What key factors would shape an adversary's decision to use nuclear weapons in a conflict with the United States and its allies?
- What concepts have adversaries developed, or are likely to develop, to employ nuclear weapons to achieve important objectives while mitigating the risk of escalation?
- How can the United States and its allies better deter nuclear use?

Scenarios where an adversary might cross the nuclear threshold by actually conducting nuclear strikes—going beyond threats and attempted coercion—are the focus here. The terms "nuclear strike" and "nuclear use" are used interchangeably as the state employment of a nuclear weapon against a target of value to an opponent. A nuclear strike is distinguished from a nuclear threat, which is an implicit or explicit warning that a state *might* conduct a nuclear strike. Such nuclear threats are intended to coerce and may manifest as statements, posturing of forces, or even nuclear testing. By this definition, an adversary that explodes a nuclear weapon over its own territory or international waters without physically harming an opponent has executed a grave nuclear threat, but has not conducted a nuclear strike or crossed the threshold of nuclear use.

There is significant benefit in developing a framework for understanding why and how potential adversaries might use nuclear weapons in a conflict with the United States and its allies. Deterrence strategies should be tailored to the adversary, accounting for individual capabilities, doctrine, and decision-making proclivities. Yet without the luxury of building a separate military force structure for every region of the world, the United States must find strategies and capabilities that apply in a variety of circumstances. Taking stock of common trends and incentives provides a point of departure for detailed analysis of the nuclear doctrines of Russia, China, North Korea, and other potential nuclear users. It also helps clarify the key requirements of tailored deterrence strategies.

References

1. Office of the Secretary of Defense, *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, DC: Department of Defense, 2018), 1.

2. Office of the Secretary of Defense, *Nuclear Posture Review 2018* (Washington, DC: Department of Defense, February 2018); Brad Roberts, *The Case for Nuclear Weapons in the 21st Century* (Palo Alto, CA: Stanford University Press, December 2015).

3. Office of the Secretary of Defense, *Summary of the 2018 National Defense Strategy of the United States of America*, 8; Elbridge Colby and Jim Thomas, "Don't Scrap America's Alliances. Fix Them." *The National Interest* (July–August 2016), http://nationalinterest.org/feature/dont-scrap-americas-alliances-fix-them-16788.

4. James J. Wirtz, "Limited Nuclear War Reconsidered," in Jeffrey A. Larsen and Kerry M. Kartchner (eds.), *On Limited Nuclear War in the 21st Century* (Stanford, CA: Stanford University Press, 2014), 268.

Competition in the Nuclear Shadow

The existence of nuclear weapons tends to deter conflict by making the consequences of an unrestrained war between nuclear-armed states too great to justify any potential benefit that a state might gain. However, the risk of nuclear escalation has not deterred all military confrontations between nuclear-armed adversaries, nor has it prevented nuclear-armed powers from exploring how to use these weapons to achieve conflict objectives while controlling escalation.

The Nuclear Revolution

Thermonuclear weapons can demolish a metropolis in a matter of minutes while leaving contamination that will yield fear and casualties for days or years. Combined with long-range ballistic missiles, these weapons can flatten distant targets in less than an hour—a stark change from the pre-1945 world, in which such wholesale devastation would require months if not years of combat. Even after decades of technological advance and military innovation, nuclear weapons are unparalleled in power. Chemical weapons terrorize soldiers and noncombatants, but their destructive force pales in comparison. Cyber weapons rival the speed of nuclear destruction, but even the most apocalyptic malware could never achieve such instantaneous human suffering and vast ruin. Militarily useful biological weapons may someday approach the lethality of large-scale nuclear war—but not yet.

Thus many of the effects of nuclear weapons on the international system— sometimes referred to as the "nuclear revolution"—persist today.[1] When two powers possess sufficient nuclear weapons that each can survive a disarming attempt by the other, then the population

centers of both are at risk in any future conflict between the two. In the World War II vision of warfare, states mobilized to completely break their enemies by all available means. Since then, nuclear-armed states are forced to acknowledge that even if they were to successfully invade and conquer an adversary, they would likely suffer enough nuclear retaliation as to leave them far worse off than before. The risk that any given conflict might escalate to a nuclear conflagration leads states to tread carefully before confronting a nuclear-armed adversary. This is one reason the postwar world has avoided large-scale conventional wars among nuclear-armed powers.[2]

Limited War

While nuclear weapons have induced caution, they have by no means prevented rivalry, competition, and conflict. Rather, nuclear-armed states have sought ways other than war to achieve their objectives and have adopted strategies for fighting limited wars without provoking their opponent to retaliate with large-scale nuclear strikes.

States engaging in limited wars against nuclear-armed powers require a theory for the use of military force to achieve objectives while regulating the risk of uncontrolled, large-scale nuclear escalation.[3] A state may limit its political and military objectives in the conflict, the way it fights, or both, and limitations may include, for example, the geographic area of the fight, the weapons used, and the pace of operations. These limitations signal that the aggression is bounded and are intended to confine the conflict to a low level of violence so that the likely costs are acceptable. A clear example of self-imposed limitation in the conduct of war is the avoidance of nuclear weapons on the assumption that the adversary will shun them as well, limiting the potential costs of war.

During the Cold War, the United States and the Soviet Union tended to fight indirectly with limited means.[4] In Korea and Vietnam, for example, the Soviet Union backed belligerents in conflict with the United States, and in Afghanistan, the United States supported insurgents resisting Soviet invasion. Both superpowers felt these threats to their interests were serious enough to justify a costly intervention and assessed that they could support their allies without assuming the unacceptable risk of nuclear war. By fighting through proxies, the So-

viet Union in Korea and Vietnam and the United States in Afghanistan were able to limit the way they fought and create a level of separation that further reduced the likelihood of escalation. At the same time, the intervening states also took steps to limit the scope and scale of their military operations to prevent local wars from becoming direct superpower clashes.

In other competitions, nuclear-armed adversaries have engaged in direct conflict, but kept war limited. China and the Soviet Union engaged in border skirmishes over a seven-month period in 1969, incurring heavy casualties on both sides. India and Pakistan fought a limited war in Kargil between May and July 1999, in which hundreds of soldiers were killed. In these conflicts, the nuclear-armed belligerents knew the inherent nuclear risks, but calculated that they could forcibly defend their interests without undue risk of large-scale nuclear war.[5] Fortunately, no party calculated that nuclear escalation was worth the risk.

U.S. and Soviet Planning for Limited Nuclear War

The competition for warfighting advantage under the nuclear shadow has not remained at the conventional level. During the Cold War, U.S.–Soviet rivalry centered on Europe, where both states sought credible capabilities and strategies that, at the very least, would make conquest of Europe unattractive. In their search for leverage, U.S. and Soviet planners explored ways that they might use nuclear weapons to achieve political and military objectives.

In the 1950s, the United States and NATO invested in a nuclear-weapons buildup because the cost of maintaining a conventional defense of Europe would have been prohibitive.[6] Rather than trying to keep a conventional war limited, NATO's strategy was to threaten "massive retaliation"—including significant nuclear strikes on the battlefield and against targets in the Soviet Union—to deter Moscow. The United States developed nuclear missiles, rockets, artillery, torpedoes, landmines, and more to strengthen its military posture. From an economy-of-investment and economy-of-force perspective, nuclear weapons were far more attractive than conventional alternatives.

In time, however, U.S. strategists concluded that threatening early, across-the-board nuclear escalation was foolhardy. Once the Soviet Union built a capability to strike the continental United States

with nuclear weapons, escalation was no longer advantageous for the United States. As early as the mid-1950s, U.S. analysts concluded that the Soviet Union might not believe that the United States would follow through on early nuclear escalation and that if war did occur, a U.S. doctrine that emphasized massive retaliation would have little or no chance of avoiding a catastrophically spiraling conflict.[7]

As a result, the United States adjusted its strategy in the 1960s and 1970s to emphasize "flexible response" over massive retaliation. Instead of relying principally on nuclear weapons to offset conventional inferiority, NATO improved its ability to defeat a large-scale Soviet attack against Western Europe. At the same time, NATO developed capabilities and doctrine to execute limited nuclear strikes using short-range systems intended to confine a nuclear conflict to the battlefield or theater.[8] The strategic rationale for developing limited nuclear options was to demonstrate to Soviet leaders that U.S. escalation threats were credible at a time when the Soviet Union had achieved de facto parity and was developing the means to employ nuclear weapons in Europe.[9]

Soviet nuclear planning also evolved throughout the Cold War.[10] In the 1950s and 1960s, the Soviets assessed that any war with the United States in Europe would inevitably lead to large-scale nuclear war. They therefore planned to use nuclear weapons early in a given conflict to generate an advantage. But Soviet policy began to shift in the mid-1960s, and by the 1970s, the Soviets were entertaining concepts of limited nuclear strikes in Europe.

Even with a diverse set of nuclear capabilities and well-developed concepts for limited nuclear war, neither U.S. nor Soviet planners arrived at a strategy that they were confident would generate a military advantage through nuclear employment in Europe while sufficiently limiting the risk of escalation. The United States developed theories of tactical nuclear warfare, but was never positive that it could keep a nuclear war in Europe limited and local.[11] In the early 1980s, former secretary of defense Robert McNamara concluded that "In terms of their military utility, NATO has not found it possible to develop plans for the use of nuclear artillery which would both assure a clear advantage to the Alliance and at the same time avoid the very high risk of escalating to all-out nuclear war."[12]

Soviet planners reached similar conclusions. The Soviet Union had plans to initiate a theater nuclear war if leaders thought that NATO

nuclear use was imminent or the Warsaw Pact was facing decisive military defeat.[13] But Soviet planners believed that initiating a limited nuclear war would run counter to Soviet interests in most circumstances.[14] By the 1970s, they assessed that the Soviet Union could win a European war conventionally and that introducing nuclear weapons would be counterproductive. They calculated that even a limited nuclear exchange between the two superpowers would cause massive humanitarian and economic destruction and damage the Soviet military more than would a solely conventional war. Finally, despite preparing limited nuclear options and exploring intra-war bargaining, Soviet planners were never convinced that they could execute limited nuclear strikes while reasonably controlling escalation.

Because of the high stakes and ubiquity of nuclear weapons on both sides, neither the United States nor the Soviet Union was persuaded that it could both improve its prospects via nuclear weapons and also control escalation. Thankfully, NATO and the Warsaw Pact never engaged in a major European conflict, so neither Washington nor Moscow was forced to contemplate carrying out a high-risk strategy for controlling escalation in the crucible of war.

References

1. Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca, NY: Cornell University Press, 1989).

2. Bruno Tertrais, "The Causes of Peace: The Role of Deterrence," *Recherches & Documents,* No. 2 (January 2018), Foundation pour la Recherche Stratégique, https://www.frstrategie.org/web/documents/publications/recherches-et-documents/2018/201802.pdf.

3. Robert E. Osgood, *Limited War Revisited* (Boulder, CO: Westview Press, 1979); Morton H. Halperin, *Limited War in the Nuclear Age* (New York, NY: John Wiley & Sons, 1963).

4. Halperin, *Limited War in the Nuclear Age*; Mark O'Neill, "Soviet Involvement in the Korean War: A New View from the Soviet-Era Archives," *Magazine of History* 14:3 (Spring 2000), 20–24; Ilya V. Gaiduk, *The Soviet Union and the Vietnam War* (Chicago, IL: Ivan R. Dee Publisher, 1996).

5. Michael S. Gerson, *The Sino–Soviet Border Conflict: Deterrence, Escalation, and the Threat of Nuclear War in 1969* (Alexandria, VA: Center for Naval Analyses, November 2010); Christopher J. Watterson, "Competing Interpretations of the Stability–Instability Paradox: The Case of the Kargil War," *The Nonproliferation Review* 24:1-2 (2017), 83–99.

6. Marc Trachtenberg, *History and Strategy* (Princeton, NJ: Princeton University Press, 1991), 153–165.

7. James R. Schlesinger, *Annual Defense Department Report FY 1975* (Washington, DC: U.S. Government Printing Office, March 4, 1974), 4–38; Osgood, *Limited War Revisited,* 15–32; William

W. Kaufman, "The Requirements of Deterrence," in William W. Kaufman (ed.), *Military Policy and National Security* (Princeton, NJ: Princeton University Press, 1956), 12–38; Henry Kissinger, "Limited War: Conventional or Nuclear? A Reappraisal," *Daedalus* 89:4 (Fall 1960), 800–817; Lawrence Freedman, *The Evolution of Nuclear Strategy*, Third Edition (New York, NY: Palgrave Macmillan, 2003), 89–113.

8. However, it often took a long time for changes in U.S. strategy and policy to drive changes in military planning. See Janne E. Nolan, *Guardians of the Arsenal: The Politics of Nuclear Strategy* (New York, NY: Basic Books, 1989); George Lee Butler and Franklin C. Miller, "Masters of the Nuclear Weapons Enterprise," in George Lee Butler, *Uncommon Cause: A Life at Odds with Convention, Volume II: The Transformative Years* (Denver, CO: Outskirts Press, Inc., 2016), 1–21.

9. Elbridge A. Colby, "The United States and Discriminate Nuclear Options in the Cold War," in Jeffrey A. Larsen and Kerry M. Kartchner (eds.), *On Limited Nuclear War in the 21st Century* (Stanford, CA: Stanford University Press, 2014), 49–79.

10. John G. Hines, Ellis M. Mishulovich, and John F. Shull, *Soviet Intentions 1965–1985: Volume I, An Analytical Comparison of U.S.-Soviet Assessments During the Cold War* (McLean, VA: BDM Federal, Inc., September 22, 1995); John A. Battilega, "Soviet Views of Nuclear Warfare: The Post–Cold War Interviews" in Henry Sokolski (ed.), *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice* (Carlisle, PA: Strategic Studies Institute, November 2004), 151–165; Notra Trulock III, "Soviet Perspectives on Limited Nuclear Warfare," in Fred S. Hoffman, Albert Wohlstetter, and David S. Yost, *Swords and Shields: NATO, the USSR, and New Choices for Long-Range Offense and Defense* (Lexington, MA: Lexington Books, 1987), 53–85; Stephen M. Meyer, "Soviet Perspectives on the Paths to Nuclear War," in Graham T. Allison, Albert Carnesale, and Joseph S. Nye, Jr. (eds.), *Hawks, Doves, and Owls: An Agenda for Avoiding Nuclear War* (New York, NY: W. W. Norton & Company, 1985), 167–205.

11. Francis J. Gavin, "The Myth of Flexible Response: United States Strategy in Europe during the 1960s," *The International History Review* 23:4 (December 2001), 847–875; Osgood, *Limited War Revisited*, 20–21.

12. Robert S. McNamara, "The Military Role of Nuclear Weapons: Perceptions and Misperceptions," *Foreign Affairs* (Fall 1983), https://www.foreignaffairs.com/articles/1983-09-01/military-role-nuclear-weapons-perceptions-and-misperceptions.

13. Central Intelligence Agency, *Warsaw Pact Tactical Forces: Capabilities and Readiness for Nuclear War* (June 1985), originally top secret, declassified July 18, 2012, https://www.cia.gov/library/readingroom/docs/1985-06-01b.pdf.

14. Hines, Mishulovich, and Shull, *Soviet Intentions 1965–1985*.

Regional War and the Threat of Adversary Nuclear Escalation

In contrast with Cold War actors, contemporary U.S. adversaries may have a stronger incentive to cross the nuclear threshold. The intense U.S.–Soviet rivalry gave way to a relatively benign period in the 1990s and 2000s, marked by preoccupation with terrorism. With less concern about conflict with nuclear-armed adversaries and improved confidence in its conventional military capabilities, the United States worked to reduce the role of nuclear weapons in its national-security strategy.[1] But the United States must now focus on the re-emergence of long-term, strategic competition with nuclear-armed, revisionist powers.[2]

Russia and China are dissatisfied with the U.S.-led international order and are pursuing strategies and capabilities to challenge U.S. influence. Russian intervention in Crimea and eastern Ukraine has revealed Moscow's willingness to use military force and threats of nuclear escalation to alter the political and territorial arrangement of Europe. China has challenged the maritime status quo without regard for international law in the East- and South China Seas.[3] Meanwhile, North Korea, having improved its nuclear-weapons capabilities, has issued explicit threats against South Korea, Japan, and the United States. As its capabilities mature, North Korea may calculate that its nuclear weapons are a shield against U.S. intervention in support of allies, especially South Korea and Japan.[4]

Scenarios for Regional Conflict and Escalation

A key concern for U.S. policymakers is that an adversary may conclude that winning a limited war with the United States and its allies is

possible. Fighting in its own backyard over interests it considers vital, the adversary may bet that its stake in the conflict outweighs U.S. resolve to defend its allies. Thus it may be willing to risk limited nuclear war on the belief that important objectives can be achieved without significant risk of large-scale escalation. To quash this line of thinking, the United States has worked to strengthen global alliances and sustain its conventional military power while upholding a firebreak between conventional and nuclear war and threatening decisive responses to any nuclear attack against the United States or its allies. The goal is to make it clear that adversaries would lose a conventional conflict with a U.S. alliance and that the likely costs and risk of escalating to nuclear war greatly outweigh the potential benefit.

Both elements of this strategy have been challenged. The United States is by far the largest and most formidable military power in the world, but is stretched by global responsibilities and enjoys less technological advantage than in the past. To defend allies in Europe and Asia, the United States must be able to flow forces across oceans and then beyond to distant conflict areas. Recognizing this liability, adversaries are investing in anti-access capabilities, such as integrated air- and missile defenses and long-range ballistic and cruise missiles for land- and sea-based targets, to hamper U.S. efforts to marshal forces and project power quickly and effectively. Like the United States, Russia, China, and North Korea would no doubt *prefer* to achieve their objectives without resorting to nuclear weapons, and they are thus pursuing cyber-weapon, counter-space, long-range precision conventional strike, and other capabilities that provide options for escalating and winning conventional wars. But to various degrees, these countries are also pursuing capabilities that will allow them to credibly threaten and employ nuclear weapons for the same purpose.[6]

There are many plausible scenarios that might pit the United States against Russia, China, or North Korea. Following its playbook of recent interventions in Ukraine, Russia may invade Estonia, Latvia, or Lithuania. Russia's goal may be conquering the Baltics, securing a land bridge to its exclave in Kaliningrad, or simply demonstrating that NATO will not or cannot defend all its members. China may attempt to deny Japan or the Philippines control of maritime territory in the East- or South China Sea (respectively) or, in a political or economic dispute, restrict maritime commerce through the first island chain. In an even more critical

scenario, China may attempt to invade and occupy Taiwan. North Korea has a long history of using military violence to coerce South Korea, Japan, and the United States and may become emboldened to once again attempt the reunification of the Korean peninsula by force. Short of that, North Korea may embark on a limited military campaign such as challenging the Northern Limit Line by occupying one of South Korea's five northwest islands.

As these scenarios illustrate, an adversary's goal might be to annex a country, seize land, control maritime territory, ensure access to resources, or simply impose political and military costs. In all likelihood, an adversary would pursue its objectives by creating a fait accompli, capitalizing on strategic surprise to quickly achieve an operational advantage, such as acquiring territory or securing control of an important waterway, and making it costly for the United States to intervene and dislodge the adversary.[7] U.S. intervention would be motivated by a desire to uphold specific alliance commitments and maintain the broader credibility of U.S. security guarantees. Therefore the goal in most cases would be a return to the status quo ante and possibly impose additional cost on the adversary to signal that attempted military aggression is costly and counterproductive.

In an ongoing conventional conflict, the United States and its allies would compete with an adversary over the terms of a cessation of hostilities.[8] Each side would have a strong interest in keeping the conflict limited to minimize costs, yet both would seek to maximally benefit from the peace that ensued. The country that perceived a higher stake in the conflict would presumably endure higher costs to achieve a preferred outcome. But in addition to the relative importance of what is being fought over, each side's resolve would be regulated by its perception of its military position and capability. The side that objectively has more at stake ultimately may have less resolve if it believes its inferior military position makes the likely costs and risk too great.

Each side's incentive to maximize postwar benefits while minimizing wartime costs means that future wars between nuclear-armed adversaries are likely to be competitions over limits on violence.[9] In an interactive process of tacit bargaining, each side will seek to establish a level of military violence below which it can achieve its political and military objectives at the lowest cost, while deterring the other side from escalating to higher levels. Either side might, for example, withhold

attacks on the other's territory or against space-based capabilities to keep a local conflict limited. Both are likely to attempt to shape other's perceptions—and the perceptions of the international community—to reinforce their preferred limitations in the conflict and discredit limitations their opponents may advance. Figure 1 depicts potential stances opponents could take in tacit conflict bargaining, from tightly controlled to very permissive.

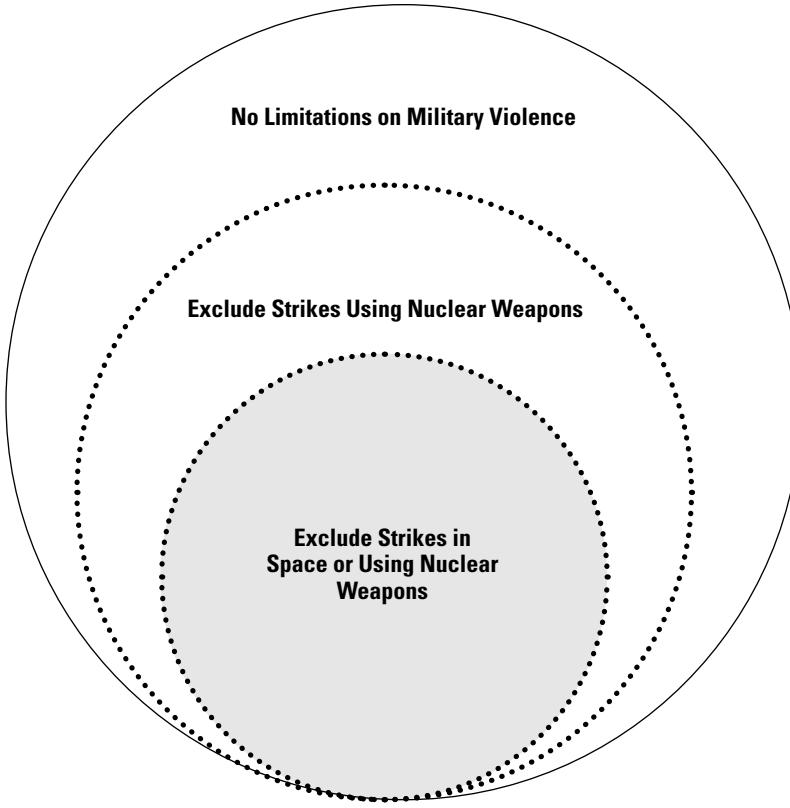

Figure 1: Tacit Bargaining over Limitations on Military Violence

Russian, Chinese, and North Korean Nuclear-Escalation Options

As long as the United States retains a joint force capable of thwarting conventional aggression, it is very likely to champion the firebreak between conventional and nuclear conflict. U.S. adversaries, however, may consider crossing the nuclear threshold and conducting limited nuclear strikes. To various degrees, Russia, China, and North Korea are developing capabilities and doctrine that would give them the *option* to employ nuclear weapons against the United States or its allies in a limited fashion while retaining the ability to inflict much higher levels of destruction. These public nuclear strategies and doctrines offer important, if not necessarily definitive, indications of a country's willingness to use nuclear weapons in certain circumstances—but capabilities, training, exercises, and situation-specific incentives are important factors as well. The more diverse the adversary's nuclear capabilities, the more options it has for threatening or conducting nuclear strikes while managing the risk of escalation.

Russia is the potential adversary best positioned to execute a strategy of limited nuclear escalation. Russia has a large, survivable strategic nuclear force and a diverse set of nuclear capabilities that can strike a variety of military targets. The 2018 *Nuclear Posture Review (NPR)* notes that Russia has over 2,000 nonstrategic nuclear weapons including

> …air-to-surface missiles, short-range ballistic missiles, gravity bombs, and depth charges for medium-range bombers, tactical bombers, and naval aviation, as well as anti-ship, anti-submarine, and anti-aircraft missiles and torpedoes for surface ships and submarines, a nuclear ground-launched cruise missile in violation of the 1987 INF [Intermediate-Range Nuclear Forces] Treaty, and Moscow's antiballistic missile system.[10]

There is some dispute among experts and intelligence specialists over exactly which circumstances might impel Russia to use nuclear weapons. Some argue that Russia's political leaders would use nuclear weapons only in a very narrow set of circumstances—either to respond

to nuclear use or on the belief that the existence of the Russian state is at stake.[11] Others, including the Department of Defense, argue that Russian capabilities, exercises, and publicly available strategy and doctrine point to a willingness to consider limited nuclear strikes in a broader range of circumstances, potentially early in a conflict.[12]

China's nuclear doctrine is more restrained than Russia's, but Beijing is developing improved regional nuclear-strike capabilities that might make a strategy of limited nuclear escalation more feasible and attractive. China publicly maintains a policy of no first use and has consistently argued that the sole function of its nuclear weapons is to deter nuclear attack.[13] China has demonstrated considerable restraint in its nuclear-weapons development; it has not pursued the diverse battlefield nuclear weapons that the United States and the Soviet Union fielded in the Cold War and Russia maintains today. Yet China continues to expand its understanding of the requirements of deterrence, moving from a minimal capability to strike metropolitan targets to a more robust, survivable nuclear force capable of reliably striking an increasing number of regional and global military targets.[14] Despite the no-first-use policy, many analysts believe the Chinese military plans to use forms of nuclear brinkmanship in a conflict by, for example, increasing force readiness, moving missile-launch units to demonstrate preparations for combat, conducting test launches, or publicly clarifying or amending its policy to allow limited nuclear strikes.[15]

North Korea has been most aggressive in issuing nuclear threats, but lacks the nuclear capabilities to match its rhetoric. North Korea has not stated a no-first-use policy, but rather has characterized its nuclear weapons as an instrument for terminating conventional wars.[16] At present, North Korea's nuclear arsenal is limited and unreliable, lacking the military infrastructure required to conduct discriminate strikes in wartime.[17] North Korea's nuclear forces have been rapidly improving, however. Because of the burst of diplomacy in spring 2018, which remains incomplete at this writing, there is a great deal of uncertainty about the future of North Korea's nuclear capabilities. But if North Korea's nuclear forces continue to improve, with the likely goal of threatening military bases and major cities in South Korea, Japan, and the United States, Pyongyang may come to think it can achieve an advantage by conducting limited nuclear strikes against regional targets while keeping intercontinental bal-

listic missiles (ICBMs) in reserve to threaten U.S. cities.[18]

Table 1 highlights three variables that can be used to assess the likelihood that an adversary will conduct limited nuclear strikes during a major conventional conflict, and how Russia, China, and North Korea measure based on each variable.

	Nuclear Use Doctrine	Nuclear Forces Posture	Nuclear Operations Training & Exercises
Russia	**Medium**	**High**	**Medium**
China	**Low**	**Medium**	**Low**
North Korea	**High**	**Low**	**Medium**

Table 1: Likelihood of Limited Nuclear Employment by Russia, China, and North Korea During a Major Conventional War

Once a country acquires nuclear warfighting capabilities, the circumstances under which it might conduct a strike are uncertain. U.S. analysts must piece together scattered information to paint an imperfect picture. Russia, China, and North Korea's classified nuclear plans likely differ from public pronouncements designed to influence foreign audiences. Moreover, even if a country's nuclear doctrine is transparent, its concepts for nuclear use may evolve, based, for example, on changes in the security environment, internal bureaucratic shifts, or new military capabilities.[19]

While a country's nuclear doctrine reveals its proclivity for using military forces in a certain way, it does not necessarily predict behavior in a crisis or conflict. Secretary of Defense James Mattis, a former general, was known to instruct his Marines that "doctrine is the last refuge of the unimaginative."[20] Mattis was pushing for innovation on the battlefield, but his statement also applies to evaluating the potential actions of U.S. adversaries. When a state is contemplating nuclear use, political decision makers and military planners are thrust into a position for which they can never truly prepare. Facing a limited war with the

United States, Russia, China, or North Korea may be forced to choose between the potential benefits and risk of nuclear escalation and the certain distastefulness of accommodation or protracted war. We cannot know what enemy leaders may choose; but prudent defense planning requires that escalation be made as unattractive as possible.

References

1. Office of the Secretary of Defense, *Nuclear Posture Review Report* (Washington, DC: Department of Defense, April 2010).

2. Office of the Secretary of Defense, *Summary of the 2018 National Defense Strategy of the United States of America*.

3. Office of the Secretary of Defense, *Nuclear Posture Review 2018*, 6–7, 30–32.

4. John K. Warden, "North Korea's Nuclear Posture: An Evolving Challenge for U.S. Deterrence," Proliferation Papers, *Ifri* (March 2017), https://www.ifri.org/sites/default/files/atoms/files/warden_north_korea_nuclear_posture_2017.pdf; Office of the Secretary of Defense, *Nuclear Posture Review 2018*, 32.

5. China continues a comprehensive modernization of its conventional military capabilities. See Department of Defense, *Military and Security Developments Involving the People's Republic of China 2017,* Annual Report to Congress (Arlington, VA: Office of the Secretary of Defense, 2017). North Korea's recent modernization has focused on long-range missiles and nuclear weapons, but it has also upgraded cyber- and electronic-warfare capabilities, special-operations forces, and other conventional military capabilities. See Department of Defense, *Military and Security Developments Involving the Democratic People's Republic of Korea 2017*, Annual Report to Congress (Arlington, VA: Office of the Secretary of Defense, 2017); In-Bum Chun, "North Korea's Offset Strategy," in Patrick M. Cronin (ed.), *Breakthrough on the Peninsula: Third Offset Strategies and the Future Defense of Korea* (Washington, DC: Center for a New American Security, November 2016), 39–49. Russia is modernizing its conventional strike capabilities to offset U.S. and NATO conventional military advantages in what appears to be an attempt to reduce its reliance on using nuclear weapons. See Anya Loukianova Fink, "The Evolving Russian Concept of Strategic Deterrence: Risks and Responses," *Arms Control Today*, July–August 2017, https://www.armscontrol.org/act/2017-07/features/evolving-russian-concept-strategic-deterrence-risks-responses; Kristin Ven Bruusgaard, "Russian Strategic Deterrence," *Survival* 58:4 (August–September 2016), 7–26.

6. Roberts, *The Case for Nuclear Weapons in the 21st Century*; Office of the Secretary of Defense, *Nuclear Posture Review 2018*.

7. Dan Altman, "By Fait Accompli, Not Coercion: How States Wrest Territory from Their Adversaries," *International Studies Quarterly* 61:4 (December 2017), 881–891; Ahmer Tarar, "A Strategic Logic of the Military Fait Accompli," *International Studies Quarterly* 60:4 (December 2016), 742–752; James J. Wirtz, "Deterring the Weak: Problems and Prospects," Proliferation Papers, Ifri (Fall 2012), https://www.ifri.org/sites/default/files/atoms/files/pp43wirtz.pdf.

8. Thomas C. Schelling, The Strategy of Conflict (Cambridge, MA: Harvard University Press, 1980); Dan Reiter, "Exploring the Bargaining Model of War," *Perspectives on Politics* 1:1 (March 2003), 27–43; Donald Wittman, "How a War Ends: A Rational Model Approach," *The Journal of Conflict Resolution* 23:4 (December 1979), 743–763.

9. Elbridge Colby, "Prevailing in Limited Wars" in Elbridge Colby (ed.) *Managing Escalation and Limiting War to Achieve National Objectives in a Conflict in the Western Pacific* (Washington, DC:

Center for a New American Security, August 2016); Schelling, *The Strategy of Conflict*; Herman Kahn, *On Escalation: Metaphors and Scenarios* (New York, NY: Frederick A. Praeger, 1965); Halperin, *Limited War in the Nuclear Age*.

10. Office of the Secretary of Defense, *Nuclear Posture Review 2018*, 53. See also Amy F. Woolf, *Nonstrategic Nuclear Weapons* (Washington, DC: Congressional Research Service, February 13, 2018), 26–28.

11. Olga Oliker and Andrey Baklitskiy, "The Nuclear Posture Review and Russian 'De-Escalation:' A Dangerous Solution to a Nonexistent Problem," *War on the Rocks*, February 20, 2018, https://warontherocks.com/2018/02/nuclear-posture-review-russian-de-escalation-dangerous-solution-nonexistent-problem/; Kristin Ven Bruusgaard, "The Myth of Russia's Lowered Nuclear Threshold," *War on the Rocks*, September 22, 2017, https://warontherocks.com/2017/09/the-myth-of-russias-lowered-nuclear-threshold/; Bruno Tertrais, "Russia's Nuclear Policy: Worrying for the Wrong Reasons," Survival 60:2 (April-May 2018), 33–44.

12. Office of the Secretary of Defense, *Nuclear Posture Review 2018*; Dave Johnson, "Russia's Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds," *Livermore Papers on Global Security* 3 (February 2018); Katarzyna Zysk, "Escalation and Nuclear Weapons in Russia's Military Strategy," *The RUSI Journal* 163:2 (2018), 1–12; Dmitry Adamsky, "Nuclear Incoherence: Deterrence Theory and Non-Strategic Nuclear Weapons in Russia," *Journal of Strategic Studies* 37:1 (2014), 91–134; Michael Frankel, James Scouras, and George Ullrich, *Nonstrategic Nuclear Weapons at an Inflection Point* (Laurel, MD: Johns Hopkins University Applied Physics Laboratory, 2017).

13. Sun Xiangli, "The Development of Nuclear Weapons in China" in Li Bin and Tong Zhao (eds.), *Understanding Chinese Nuclear Thinking* (Washington, DC: Carnegie Endowment for International Peace, 2016), 79–101; Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security* 40:2 (Fall 2015), 7–50.

14. Alastair Ian Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security* 20:3 (Winter 1995–1996), 5–42; Eric Heginbotham, Michael S. Chase, Jacob L. Heim, Bonny Lin, Mark R. Cozad, Lyle J. Morris, Christopher P. Twomey, Forrest E. Morgan, Michael Nixon, Cristina L. Garafola, and Samuel K. Berkowitz, *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States* (Santa Monica, CA: RAND, 2017), 28–33; Michael S. Chase and Arthur Chan, *China's Evolving Approach to "Integrated Strategic Deterrence"* (Santa Monica, CA: RAND, 2016), 40–44; James Johnson, "China's Evolving Approach to Nuclear War-Fighting," *The Diplomat*, November 22, 2017, https://thediplomat.com/2017/11/chinas-evolving-approach-to-nuclear-war-fighting/.

15. Timothy R. Heath, Kristen Gunness, and Cortez A. Cooper, *The PLA and China's Rejuvenation: National Security and Military Strategies, Deterrence Concepts, and Combat Capabilities* (Santa Monica, CA: RAND, 2016), 47.

16. Department of Defense, *Military and Security Developments Involving the Democratic People's Republic of Korea 2017*; Warden, "North Korea's Nuclear Posture"; "NDC Spokesman Warns U.S. of Nuclear Counter-Action," *Korean Central News Agency*, June 19, 2016; "Preemptive Nuclear Strike Is Not Monopoly of U.S.: KCNA Commentary," *Korean Central News Agency*, August 13, 2016.

17. Joseph S. Bermudez Jr., North Korea's Development of a Nuclear Weapons Strategy (Washington DC: US–Korea Institute at SAIS, 2015), 14–15.

18. Department of Defense, *Military and Security Developments Involving the Democratic People's Republic of Korea 2017*; Warden, "North Korea's Nuclear Posture"; Office of the Secretary of Defense, *Nuclear Posture Review 2018*; Defense Intelligence Agency, *Global Nuclear Landscape 2018* (Washington, DC: Defense Intelligence Agency, February 2018), 19–24.

19. James Schlesinger, Hearings before the Subcommittee on U.S. Security Agreements and Commitments Abroad and the Subcommittee on Arms Control, International Law and Organizations of the Committed on Foreign Relations of the United States, Ninety-Third Congress, Second Session, on U.S. Nuclear Weapons in Europe and U.S.–U.S.S.R. Strategic Doctrines and Policies, March 7, March

14, and April 4, 1974, *Nuclear Weapons and Foreign Policy* (Washington, DC: U.S. Government Printing Office, 1974), 160, https://babel.hathitrust.org/cgi/pt?id=mdp.39015078615740;view=1up;seq=1.

20. Evan Wright, *Generation Kill: Devil Dogs, Iceman, Captain America, and the New Face of American War* (New York, NY: The Berkley Publishing Group, 2004), 10.

Adversary Calculations at the Brink of Limited Nuclear Employment

Before crossing the nuclear threshold, adversary political and military decision makers would weigh costs and benefits, according to their biases, imperfect decision-making mechanisms, and incomplete or incorrect information.[1] It is thus difficult to predict the decisions that various states would make in a range of wartime circumstances. Nonetheless, it is important to review the situational factors that would frame decisions at the nuclear brink. This section describes key issues that will loom as an adversary considers its alternatives.

The Relative Attractiveness of the Alternative Path

Assessments of the likely costs and benefits of conciliation, accommodation, or protracted conflict—the alternates to nuclear escalation—will affect an adversary's judgment about the *relative* attractiveness of introducing nuclear weapons in a conflict.[2] The likely outcomes of continuing to fight below the nuclear threshold must be contemplated by political and military decision makers. If they are in a position of strength and achieving important objectives—and are confident this will continue—they will likely continue the conventional campaign, attempt to consolidate gains, and eventually seek a favorable negotiated outcome. But even with a clear advantage, an adversary might consider employing nuclear weapons if an opportunity for a quick end or more favorable accord seems to present itself.

If, by contrast, the adversary is in a weak position, losing on the battlefield or feeling a shift in the military balance, it has a much stronger incentive to pursue escalation. Critically, the adversary would not need a theory for achieving a decisive win or even for securing a more

favorable peace than the pre-war status quo; it only need decide that the chance of improving its prospects relative to the non-nuclear path are worth the risk. As an alternative to accepting certain loss, whether minor or major, the adversary might attempt to create a better bargaining positioning for a more favorable accord. For example, if regime leaders perceived threats to their power, either because the United States and its allies were pursuing regime change or because even limited defeat would stir internal revolt, they would have very strong incentive to gamble to improve their situation by employing nuclear weapons, even if the probability of success were low.[3]

The Potential Benefits of Nuclear Escalation

A value-maximizing adversary might envision two rationales by which to improve its position through limited nuclear strikes.[4]

First, taking nuclear action *suggests* the potential for yet further escalation: if gradually increasing nuclear threats fail to arrest the United States and its allies, a nuclear strike might increase the credibility of escalation threats. Potentially suggestive nuclear attacks could range from a single strike against a remote military target to strikes that inflict significant collateral damage against a number of military targets. Further escalation might be threatened by signaling a willingness to impose higher costs on the United States and its allies until they back down or by warning that further escalation could not be meaningfully restrained should the United States and its allies counter-escalate. With either approach, the goal is to terrorize U.S. and allied political and military decision makers and populations.

Limited nuclear strikes might augur further escalation for three audiences: the United States, the targeted country, and other U.S. allies and partners. An adversary would likely target the party it sees as most threatening or vulnerable and may focus on deterring U.S. intervention or compelling Washington to limit its war aims. This may lead either to the direct nuclear targeting of U.S. forces to maximize the U.S. fear of escalation or to indirect targeting of Washington by striking U.S. allies, with the suggestion that the United States will be next. Alternatively, an adversary might decide that the country invaded or another ally is the weak link and target them to splinter the U.S-led alliance.

A second rationale for using nuclear weapons is to achieve *instru-*

mental benefits in the conflict. Rather than coercing decision makers and populations via the specter of an escalating nuclear war, instrumental escalation coerces by decisively improving the aggressor's military position. Instrumental use might seem particularly attractive, insofar as the tactical benefits of limited nuclear strikes would translate to operational or strategic effects. If an adversary can use nuclear weapons to degrade the American and allied ability to command and control theater forces, flow surge forces to the battlefield, or project air- and naval power in the conflict area, the cost to the United States and its allies of restoring the status quo ante would significantly increase.

For advanced militaries, nuclear weapons have less military utility than they did at the height of the Cold War. The United States and the Soviet Union developed megaton-class, city-busting weapons but also a diverse set of nonstrategic regional strike and tactical, battlefield nuclear forces in the form of short- and medium-range ballistic and cruise missiles, artillery shells, anti-ship rockets, torpedoes, missile-defense interceptors, and more. Adding nuclear warheads to these systems greatly increased their lethal radius. But over the years, technological advances have made conventional weapons more deadly and accurate. Missiles and bombs carrying powerful conventional munitions can be redirected in flight and guided precisely to their target by satellite positioning data, laser spotters, and terminal seekers. With such accuracy, less explosive power is required to destroy many targets, reducing the military imperative for nuclear weapons.

Yet while the general trend has been to conventional weapons substituting for nuclear, U.S. adversaries have nonetheless developed and deployed diverse nuclear forces and may find that certain capabilities would provide a significant advantage over conventional alternatives in some circumstances.

First, some military targets, such as hardened, deep targets, will resist all but nuclear weapons.

Second, nuclear weapons compensate for inaccuracy, delivering greater explosive yield and farther lethality. In ideal conditions, high-tech conventional munitions can destroy targets with conventional ordnances delivered accurately. In wartime, however, an adversary may have sparse intelligence, surveillance, and reconnaissance information on U.S. and allied forces, possibly because of disruptions caused by space and cyberspace attacks, or may discover that terminal seekers

are less effective than expected. Nuclear weapons can disable many forces over a wide area by delivering significant blast, overpressure, and radiation; the affected area may be wider still if the adversary optimizes strikes to emit a strong electromagnetic pulse (EMP).

Third, nuclear forces can compensate for lack of available firepower. As a conflict develops, the adversary may be short of conventional-strike options, either because munitions stocks have been depleted or the location and disposition of its conventional forces are disadvantageous.

An adversary may consider the benefits of nuclear employment before or during a conflict. A particularly risk-prone adversary may set about prepared to conduct nuclear strikes to overcome conventional shortfalls, hoping that the combined instrumental and suggestive effect of nuclear use will force the United States to back down. Alternatively, an adversary might enter a conflict expecting to win via conventional means, but discover that its non-nuclear military capabilities are insufficient. In these circumstances, the pressure of war may push political and military leaders to explore military operations that incorporate nuclear weapons.

The Likely Costs and Risk of Crossing the Nuclear Threshold

An adversary contemplating nuclear escalation will try to project probable reactions and likely consequences, considering both the likely costs of the political and military reaction and the risk that escalation will get out of control. If either is too high as compared to likely gains, crossing the nuclear threshold will probably be viewed as an unattractive gamble.

In limited-war scenarios, the adversary's foremost concern will likely be large-scale nuclear retaliation by the United States,[5] and it may therefore restrict variables such as the number and types of weapons used, the geographic area or countries involved, the interval between strikes, or the types of targets chosen.[6] While the adversary may hope that going nuclear will convince the United States and its allies to cease hostilities and adjure retaliation, more likely it will anticipate that, at the very least, the United States will follow precedent by responding in kind with similar weapons against a similar target set. If this response would arrest the adversary's military advantage (as compared to its

chances under conventional war) or impose economic losses that dwarf potential gains, nuclear employment will be unattractive.

The adversary also needs to weigh the risk of setting off a widening spiral that culminates in a large exchange of nuclear weapons against major cities and centers of power. Few, if any, stakes would be worth such a price; the probability of unlimited escalation would have to be low indeed for the nuclear foray to proceed. In addition, the adversary would have to calculate the likelihood and probable results of U.S. escalation, beyond the precedent set by the initial nuclear use. In the pre-nuclear phase, the United States will have withheld its nuclear capabilities and possibly some non-nuclear operations as well. The adversary must assess the consequences if the United States brought these capabilities into play. Thus the risk of escalation involves both the likelihood that the United States will escalate further and the consequences if so.

Finally, an adversary contemplating nuclear use must gauge the political fallout. Significant backlash must be expected for any state that violates the international norm against nuclear employment—the question would be how much and whether the adversary would be swayed by such considerations.[7] While the coercive goal of a limited nuclear attack is accommodation, the adversary must beware inadvertently reinforcing the resolve of its opponents. Adversary nuclear strikes that cause significant, unnecessary, and disproportionate loss of life may very well rally U.S. leadership and popular support for an in-kind or escalatory response, whether from rational calculation about the dangers of a reckless regime, a visceral desire for retribution, or increased stakes related to the global norm against nuclear use. Besides expanding the military means used to prosecute the war, the United States may expand its war aims, potentially shifting from a strategy content with the status quo ante to an ambitious program of regime change.

Backlash from at least two additional sources is important. First, if the domestic audience considers nuclear employment reckless or immoral, it may oppose the war.[8] Second, countries that are uninvolved or only partly engaged might respond by aligning with the United States or supporting stronger sanctions and containment after the conflict ends. Either reaction might offset the possible advantages of escalation.

References

1. Keith Payne, "Understanding Deterrence," *Comparative Strategy* 30:5 (2011), 393–427.

2. This is sometimes referred to as the "consequences of restraint." See U.S. Strategic Command, *Deterrence Operations Joint Operating Concept,* Version 2.0 (Offutt AFB, NE: U.S. Strategic Command, December 2006).

3. Kier A. Lieber and Daryl G. Press, *Coercive Nuclear Campaigns in the 21st Century: Understanding Adversary Incentives and Options for Nuclear Escalation* (Monterey, CA: Naval Postgraduate School Center on Contemporary Conflict, January 2013); Kerry M. Kartchner and Michael S. Gerson, "Escalation to Limited Nuclear War in the 21st Century," in Jeffrey A. Larsen and Kerry M. Kartchner (eds.), *On Limited Nuclear War in the 21st Century* (Stanford, CA: Stanford University Press, 2014), 163–164.

4. Forrest E. Morgan, Karl P. Mueller, Evan S. Medeiros, Kevin L. Pollpeter, and Roger Cliff, *Dangerous Thresholds: Managing Escalation in the 21st Century* (Santa Monica, CA: RAND Corporation, 2008), 30–31; Kartchner and Gerson, "Escalation to Limited Nuclear War in the 21st Century," 150–151; Robert Powell, *Nuclear Deterrence Theory: The Search for Credibility* (New York, NY: Cambridge University Press, 1990); Thomas C. Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 2008).

5. In Europe, Russia would also assess the potential for an independent nuclear retaliation by the United Kingdom, France, or NATO. But the United Kingdom and France, with far less capable conventional and nuclear capabilities, would be unlikely to escalate beyond the United States unless they were directly attacked, and NATO would only be able to respond with nuclear weapons if the United States consented.

6. Jeffrey A. Larsen, "Limited War and the Advent of Nuclear Weapons," in Jeffrey A. Larsen and Kerry M. Kartchner (eds.), *On Limited Nuclear War in the 21st Century* (Stanford, CA: Stanford University Press, 2014), 5–6.

7. For discussions of the norm against the use of nuclear weapons, see Nina Tannenwald, "Stigmatizing the Bomb: Origins of the Nuclear Taboo," *International Security* 29:4 (Spring 2005), 5–49; T.V. Paul, "Taboo or Tradition? The Non-Use of Nuclear Weapons in World Politics," *Review of International Studies* 36:4 (October 2010), 853–863; Scott D. Sagan and Benjamin A. Valentino, "Revisiting Hiroshima in Iran: What Americans Really Think about Using Nuclear Weapons and Killing Noncombatants," *International Security* 42:1 (Summer 2017), 41–79.

8. This may be less of a concern for authoritarian countries like Russia, China, and North Korea that have a greater ability to manipulate the story promulgated to their populations. See, for example, Christopher Walker and Robert W. Orttung, "Breaking the News: The Role of State-Run Media," *Journal of Democracy* 25:1 (January 2014), 71–85.

Adversary Strategies for Prevailing in Limited Nuclear War

For an adversary to take the nuclear route, political and military decision makers would require an executable strategy with an acceptable probability of improving postwar prospects that presents limited risk.[1] This section explores nuclear-escalation management strategies that Russia, China, or North Korea might adopt if the alternatives to nuclear employment are extremely grim.

Threaten Uncontrollable Nuclear Escalation

An adversary might attempt to truncate a conflict by conducting a limited nuclear strike and threatening uncontrollable nuclear escalation if the United States advances its campaign. Consider the classic example of a game of "chicken," with two cars driving toward each other and daring the other to swerve first. One strategy might be to throw the steering wheel out the window, signaling a lack of control that forces the other car to swerve to avoid disaster. Similarly, in "nuclear chicken," an adversary might explicitly threaten uncontrollable escalation should the United States retaliate in kind or continued its conventional campaign. In an extreme version, the adversary could set up a system to automatically launch all its nuclear weapons under certain conditions; but a more realistic scenario would be a warning that escalation will not be controlled if the conflict continues.[2] To amplify this threat, the adversary might make a public commitment to escalation, thus increasing the reputational costs of backing down, or may pre-delegate launch authority to tactical commanders.

The potential payoff of a successful threat is obvious: namely, that accommodation will be chosen as the only rational move. But there

are risks. The United States and its allies might be skeptical of the adversary's resolve, guided by their assessment of the stakes in the conflict or intelligence about planned actions. Moreover, taking steps that increase the credibility of the threat would weaken the regime leadership's control, decreasing its ability to manage escalation deliberately if the threat is probed. Particularly in states like Russia and China, with mature nuclear weapons programs and many options between initial nuclear use and large-scale nuclear war, leaders are likely to find the downside risk of pre-delegation unacceptable.

These factors suggest that an adversary would threaten uncontrolled escalation only in the direst circumstances. For a state like North Korea, with a limited nuclear arsenal, immature command and control of its nuclear forces, and a significant risk of suffering total defeat in a prolonged conventional conflict with the United States, threats of uncontrolled escalation may be an attractive option in the early stages of a conflict. If the Kim Jong-un regime were on the verge of being overrun, it would have a clear, near-maximal stake in terminating the conflict, making its threat of uncontrollable escalation far more credible. The United States and its allies would also anticipate that the North Korean leadership might lash out even without the prospect of survival. But in the vast majority of situations, the leaders in Pyongyang would still hold out some hope of improving their prospects. They might, for example, offer to relinquish power in exchange for a comfortable exile. In these circumstances, North Korea's leaders would retain a strong interest in reserving a portion of their survivable nuclear forces for bargaining leverage, and thus have incentive to maintain centralized control and deliberate management of nuclear escalation.[3]

Figure 2 depicts an adversary strategy designed to threaten uncontrollable escalation following its initial limited nuclear strike.

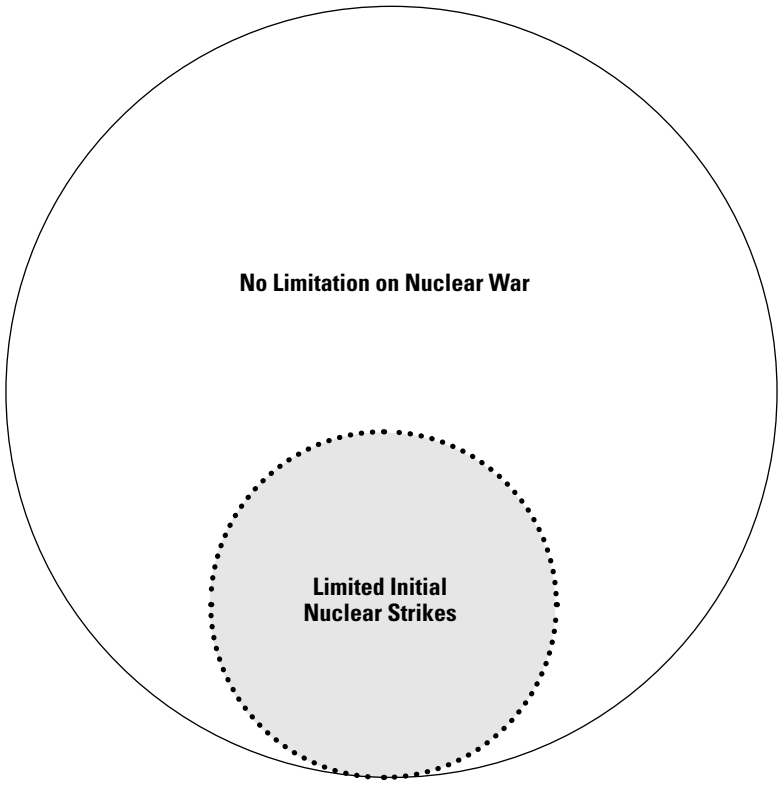

Figure 2: Adversary Strategy to Threaten Uncontrollable Nuclear Escalation

Limited-Nuclear-War Control

Because of the inherent limitations of a strategy premised on threatening uncontrollable escalation, adversaries are more likely to consider escalation management based on limited-nuclear-war control. The strategies most attractive to an adversary would be those that maximized the instrumental and suggestive value of crossing the nuclear threshold while minimizing the risk of retaliation, counter-escalation, and backlash. The goal would be to set the conditions for favorable negotiations without harming one's military, population, and economy, thereby negating one's gains. Depending on the circumstances, the adversary may seek implicit rules for nuclear conflict that allow only a

narrow set of nuclear strikes or less restrictive rules that allow operations against a variety of targets. Leaders may begin by establishing one tacit boundary, then move beyond, either to counteract U.S. escalation or improve their political and military position. For example, if a limited nuclear strike designed to compel capitulation were met in kind, the adversary may move to a higher level of limited nuclear war, hoping to achieve a military advantage.

The confidence of U.S. adversaries in their theories of nuclear-war termination stems from a number of factors. For example, Russia, China, and North Korea are likely to perceive U.S. interests in regional conflicts involving allies as critical to American interests, but not so vital as was the global, existential Cold War battle between capitalism and communism. An adversary, therefore, may apprehend an asymmetry of stakes and derive greater resolve in any contest of escalation.[4] The adversary is also likely to see the risks of uncontrolled nuclear escalation as having declined since the Cold War. With fewer nuclear options available in the U.S. arsenals and control of nuclear employment concentrated at high levels, adversaries will likely expect any U.S. decision to use nuclear weapons as highly deliberate act under the control of political leaders rather than a routine military operation. As a result, the adversary may think it has a better chance of controlling nuclear escalation at a desirable level.

After crossing the nuclear threshold, adversaries are likely to seek limits on nuclear warfare that meet three requirements.

First, the adversary will attempt to tacitly negotiate a limitation that provides a net advantage. In other words, the adversary will seek nuclear operations that have an important tactical impact as compared to non-nuclear alternatives, that transform tactical gains into an improved operational situation, and whose benefits outweigh the likely costs of countervailing nuclear operations.

Second, the adversary will likely pursue limitations that clearly distinguish between the type of nuclear strikes it plans to conduct and other nuclear operations.[5] A sharp boundary will allow the adversary to limit the likelihood of unintended escalation, making it clear that the nuclear costs to the United States and its allies will remain limited as long as they avoid escalation. This discrimination would also shape U.S. and allied perceptions and international public opinion to justify the adversary's nuclear use as restrained and proportionate and U.S.

escalation as reckless and disproportionate.

Third, the adversary will likely have some basis for hope that the United States would be unwilling or unable to escalate to a higher level of nuclear violence where the United States would have the advantage. The adversary's strategy requires a plausible way of preventing nuclear escalation from rising such that the costs are incommensurate with likely gains.

Decoupling Theater and Strategic Nuclear War

One distinction that adversaries might draw is between a limited nuclear war within the region of conflict and a large-scale nuclear war involving the continental United States. Russia has the most capability in this regard and could execute a range of nuclear strikes, including tactical strikes on the battlefield and medium-range strikes throughout Europe. China and North Korea are expanding their capacity for nuclear strikes against U.S. forces and bases in the Western Pacific, using medium-range nuclear missiles. All three have, or are developing, the ability to hold long-range ballistic missiles in reserve to threaten U.S. cities and thus deter counter-escalation. Russian military writings distinguish between "regional" war and "strategic" or "global" nuclear war, concluding that the latter cannot be rationally fought because of the costs, but that regional strikes with nonstrategic nuclear forces would enable Russia to destroy U.S. and NATO strike formations and wreak significant economic damage in Europe.[6] China and North Korea have been less explicit in drawing this distinction, but the capabilities they are developing for nuclear strikes against U.S. bases in the Western Pacific will give them the ability to do so.[7]

Any of these three nuclear-armed states might calculate that incorporating theater nuclear strikes into its military operations would yield an instrumental advantage. A key aspect of envisioned future conflicts between the United States and Russia, China, or North Korea is that the United States will be forced to flow forces forward to the battlefield, whether it be the Baltics, the Korean Peninsula, or China's maritime periphery. Attractive nuclear targets for the adversary, therefore, would include key ports and air bases that are transit- and power-projection hubs and aircraft carriers, surface ships, and submarines that are moving to the region to augment U.S. striking power. If the adver-

sary were to determine that its conventional forces were insufficient to hold these targets at risk—whether because of too few munitions or doubts as to the accuracy of its conventional means of delivery—then nuclear weapons might appear attractive as a military solution toward operational objectives.

The adversary's goal would be to lock in territorial gain or prevent territorial loss by keeping U.S. power-projection forces at a distance while fortifying its position in and around the disputed territory. Russia, for example, might successfully invade and conquer one or more Baltic states then use nuclear weapons on a limited scale to compel the United States and NATO to accept the outcome.[8] Russia likely understands that it cannot match a fully-mobilized NATO, so a limited use of nuclear weapons to discourage mobilization might be seen as an attractive means to coerce the United States and its allies to stand down and relinquish lost territory. In another scenario, a North Korean invasion of South Korea is repelled, but North Korea then unleashes nuclear strikes to persuade the United States and South Korea to accept the pre-war status quo rather than pursue regime change.[9] North Korea's leaders likely know—far more so than Russia—that they must cease conflict with the United States quickly if they wish to survive.

An adversary strategy designed to draw a distinction between theater and global nuclear conflict would also attempt to divide the United States from its allies. Russia, for example, may attempt to separate Europe from North America to focus coercive pressure on NATO countries while avoiding nuclear strikes on the continental United States that would all but guarantee retribution.[10] Against countries without their own nuclear weapons, Russia might increase pressure through significant military and economic damage. Against the United States, France, and the United Kingdom, which have the means to retaliate in kind, Russia may *suggest* the potential of escalating its nuclear strikes in a bid for conciliation. It is also plausible that Russia would sow division within NATO by limiting its initial nuclear strikes to the country under invasion or countries within the former Soviet sphere of influence, meanwhile suggesting escalation against the rest of NATO. In Asia, China and North Korea might act on similar logic, executing nuclear strikes against allied targets while threatening strikes against the United States. In a war on the Korean Peninsula, North Korea may conduct limited nuclear strikes against Japan or South Korea to explode

the trilateral U.S.–Japan–South Korea relationship. In a conflict over the Senkaku/Diaoyu Islands, China might conduct direct nuclear strikes against Japan to sap its will.

In weighing whether the benefits of escalation would outweigh the costs of retaliation, Russia in particular might assess theater war to be advantageous because of its diverse nuclear capabilities, optimized for a variety of military missions. If Russia were able to leverage its theater-range ballistic and cruise missiles and tactical nuclear weapons and the United States were limited to nuclear gravity bombs and air-launched cruise missiles (ALCMs), Moscow might realize a significant advantage, particularly as compared to a conventional war, in which U.S. precision-strike capabilities are far superior.[11] In addition to its robust nuclear-strike forces in this category, Russia is improving its integrated air and missile defenses, which may build confidence that it has a shield against U.S. retaliation via air-delivered weapons. China and North Korea have fewer theater-range nuclear-armed ballistic missiles than the United States has nuclear-armed cruise missiles and gravity bombs and therefore enjoys less advantage, if any. But an adversary without a clear nuclear-capability advantage might, nonetheless, determine that a kind-for-kind exchange would be favorable. If nuclear weapons enabled the destruction of key U.S. facilities or platforms (e.g., operations centers and aircraft carriers), China, North Korea, or Russia might be willing to endure similar numbers and types of U.S. nuclear strikes in retaliation, calculating that these strikes would be comparatively less damaging to their campaign.

Going further, an adversary might also attempt to manipulate the "rules" of theater nuclear warfare to its advantage. An adversary might, for example, attempt to exclude strategic delivery systems—ICBMs, submarine-launched ballistic missiles (SLBMs), and bombers traditionally covered by strategic arms-control agreements—from theater nuclear war, or dissuade the United States from conducting nuclear strikes against targets in its territory. In both cases, the adversary would warn that U.S. strikes against its homeland or using a "strategic" asset would trigger a nuclear strike against targets in the United States. The adversary's goal would be to manipulate U.S. perception of the risk of escalation to set the conditions for operational success. Figure 3 depicts potential limitations that an adversary might advance to favorably manage a theater nuclear war.

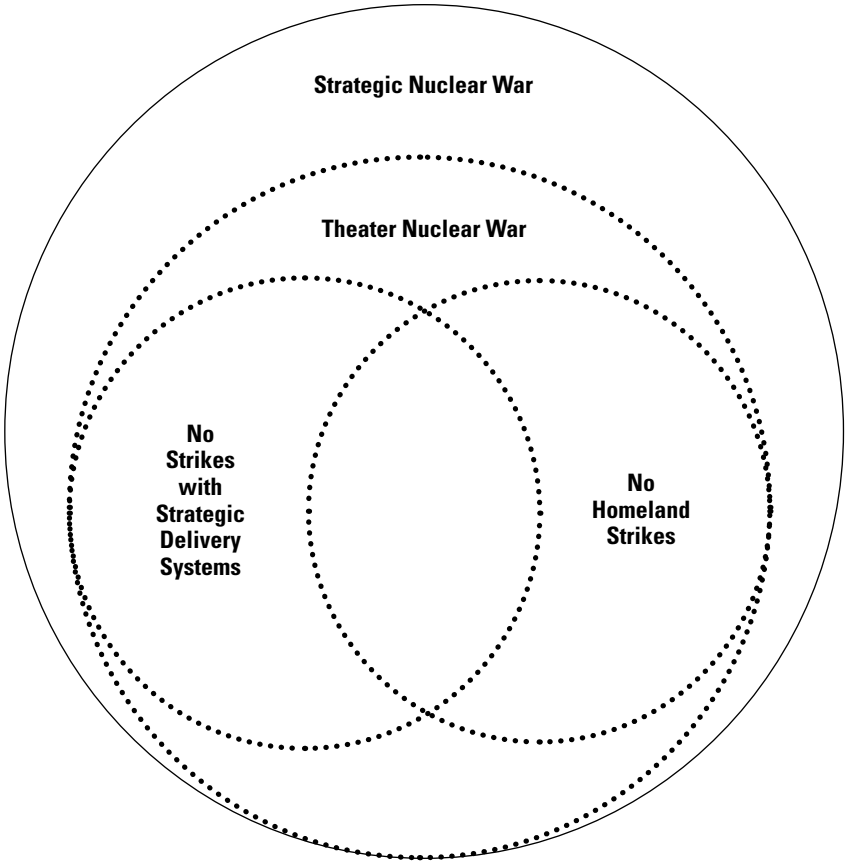

Figure 3: Adversary Strategy to Manage Theater Nuclear War

Distinguishing Types of Nuclear Strikes

U.S. adversaries might also distinguish between nuclear use consistent with Law of Armed Conflict traditions and strikes that are far less discriminating. In popular depictions, any use of nuclear weapons causes catastrophic, indiscriminate loss of life. But in fact, nuclear weapons come in many shapes and sizes, and their destructive effects vary widely.[12] While weapon type and yield is important, it is only one factor in determining whether nuclear strikes are perceived as discrimi-

nate and proportionate; the method and location of nuclear detonations, targets struck (type and location), and number of noncombatant casualties are at least as important. A surface-burst with a low-yield nuclear weapon in the middle of a metropolis, for example, would not be perceived as discriminate under most standards.

There are a number of ways adversaries might think about using nuclear weapons in line with Law of Armed Conflict principles of discrimination and proportionality. Uses that *could* result in low noncombatant casualties include an intercept of an incoming ballistic missile; a detonation in outer space targeting U.S. command, control, intelligence, surveillance, and reconnaissance; a strike in the upper atmosphere designed to generate EMP effects at the surface; a strike at sea targeting U.S. surface ships or submarines; or a strike with a low-yield weapon against a relatively isolated military target on the ground. Some U.S. adversaries might also deploy "clean," low-yield nuclear weapons with higher fusion-fraction reactions to achieve significant military effects with far less residual radiation.[13] All three potential U.S. adversaries discussed here have some capacity to conduct nuclear strikes with low collateral damage—but Russia has more options and would therefore be most likely to pursue this distinction.

An adversary may seek military advantage by conducting limited tactical nuclear strikes while arguing that nuclear operations compliant with these standards are categorically different from other nuclear operations. For each of the nuclear strikes described above, it is easy to imagine plausible circumstances in which an adversary could substantially improve its position in a continuing conflict. If the adversary could do so in a way that caused few, if any, civilian casualties, it might have found a way—or assume it has found a way—to avoid some of the backlash associated with transgressing the nuclear threshold.[14] Assessing the potential international reaction in this type of contingency, Mark Fitzpatrick argues that

> The immediate moral stigma attached to nuclear use might be less if the nuclear weapon(s) used were very small, accurate bombs with minimal collateral damage and civilian casualties for which the "just war" criteria of necessity, proportionality and discrimination could be said to apply.[15]

The adversary might argue that U.S. counter-escalation with nuclear operations would cause far more noncombatant casualties than would be morally justified.

If the United States lacked nuclear-strike options that were clearly justifiable in these terms while still offering a significant military impact, the adversary will have created a new firebreak below which it will enjoy an advantage. Indeed, the concern that Russia may have a doctrine for limited nuclear war that distinguishes between high- and low-yield nuclear weapons is an important theme of the 2018 *NPR*. Referring to Russia, General Paul Selva, vice chairman of the Joint Chiefs of Staff, states "There is compelling evidence that at least one of our potential competitors in this space believes they can get away with striking us with a low-yield weapon."[16] If Russia used low-yield weaponry in a regional conflict, the United States might hesitate to use high-yield weapons in response, because these options would appear disproportionate and, therefore, too escalatory.[17] In a similar vein, North Korea, China, or Russia might calculate that they can conduct nuclear strikes in space, EMP strikes, or nuclear strikes at sea while deterring the United States from responding with strikes that would cause far more civilian casualties. To the degree that an adversary perceives the United States lacks effective options for proportionate and discriminate response, it may believe it can wage limited nuclear war with acceptable risk.

An adversary might tacitly attempt to establish even stricter limitations on nuclear use in certain circumstances. It might, for example, distinguish between uses of nuclear weapons at sea and on land. The U.S. Navy plays a critical role in U.S. power projection, making aircraft carriers, destroyers, and attack submarines lucrative targets.[18] If an adversary could better target these platforms with nuclear weapons, it might alter the military balance with few, if any, civilian casualties and this action could be clearly differentiated from other types of nuclear operations. Conducting the strikes from the adversary's own naval platforms would provide an even sharper and more credible distinction between land and sea deployment.

During the Cold War, the Soviet Union recognized the comparative advantage of U.S. naval power and planned to use nuclear weapons at sea to offset U.S. conventional superiority.[19] Contemporary Russia retains similar ideas about the potential benefits of nuclear war at sea: its 2017 naval doctrine emphasizes that "in conditions of escalation of a

military conflict, demonstration of readiness and determination to use force by employment of a non-strategic nuclear weapon is an efficient deterrence factor." This requires the Russian navy to, according to the doctrine, retain "the capability… to inflict not less than critical damage on the enemy fleet by use of non-strategic nuclear weapons."[20] China and North Korea have not publicly distinguished between nuclear strikes at sea and on land, but will have reason to do so during war as long as the United States retains a significant naval advantage. Figure 4 depicts potential limitations that an adversary might advance to favorably manage the types of nuclear strikes deemed acceptable in war. The complex interrelationship among different potential categories of limitation is apparent.

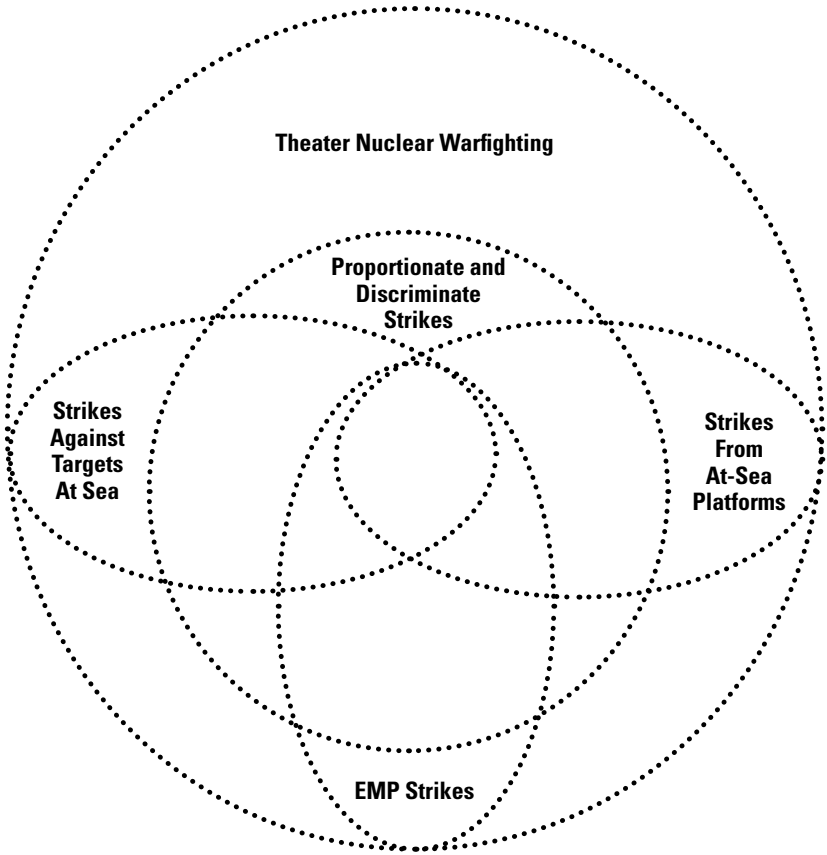

Figure 4: Adversary Strategy to Manage Types of Nuclear Strikes

References

1. Victor A. Utgoff and Michael O. Wheeler, *On Deterring and Defeating Attempts to Exploit a Nuclear Theory of Victory* (Alexandria, VA: Institute for Defense Analyses, April 2013); Roberts, *The Case for Nuclear Weapons in the 21st Century*.

2. Schelling, *Arms and Influence*, 92–125; Schelling, *The Strategy of Conflict*, 187–203.

3. Matthew Kroenig, *The Logic of America Nuclear Strategy: Why Strategic Superiority Matters* (New York, NY: Oxford University Press, 2018), 137–141.

4. Roberts, *The Case for Nuclear Weapons in the 21st Century*; U.S. Strategic Command, Deterrence Operations Joint Operating Concept, 17; Kroenig, *The Logic of America Nuclear Strategy*, 4.

5. Schelling, *The Strategy of Conflict*, 261–263; Schelling, *Arms and Influence*, 126–189.

6. Johnson, "Russia's Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds," 16, 25, 71–72; Zysk, "Escalation and Nuclear Weapons in Russia's Military Strategy," 1–4.

7. Jeffrey Lewis, "North Korea Is Practicing for Nuclear War," *Foreign Policy*, March 9, 2017, http://foreignpolicy.com/2017/03/09/north-korea-is-practicing-for-nuclear-war/; Warden, "North Korea's Nuclear Posture"; Lee Fuell, "Broad Trends in Chinese Air Force and Missile Modernization," Department of the Air Force Presentation to the U.S.–China Economic and Security Review Commission, January 30, 2014, http://www.dtic.mil/dtic/tr/fulltext/u2/a593473.pdf; Johnson, "China's Evolving Approach to Nuclear War-Fighting."

8. Johnson, "Russia's Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds," 67.

9. Warden, "North Korea's Nuclear Posture."

10. Johnson, "Russia's Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds," 86–87.

11. Office of the Secretary of Defense, *Nuclear Posture Review 2018*, 53–54.

12. Michael Frankel, James Scouras, and George Ullrich, *The Uncertain Consequences of Nuclear Weapons Use* (Laurel, MD: Johns Hopkins University Applied Physics Lab, 2015); Samuel Glasstone and Philip J. Dolan, *The Effects of Nuclear Weapons* (Washington, DC: U.S. Government Printing Office, 1977).

13. James L. Denton, *The Third Nuclear Age: How I Learned to Start Worrying about the Clean Bomb* (Montgomery, AL: Air War College, February 14, 2013), http://www.dtic.mil/dtic/tr/fulltext/u2/1018896.pdf; Frankel, Scouras, and Ullrich, *Nonstrategic Nuclear Weapons at an Inflection Point*.

14. Mark Fitzpatrick, "The World After: Proliferation, Deterrence and Disarmament if the Nuclear Taboo is Broken," Proliferation Papers, *Ifri* (Spring 2009), 17–18; George H. Quester, "The End of the Nuclear Taboo?" in Jeffrey A. Larsen and Kerry M. Kartchner (eds.), *On Limited Nuclear War in the 21st Century* (Stanford, CA: Stanford University Press, 2014), 181.

15. Fitzpatrick, "The World After," 18.

16. Quoted in Lisa Ferdinando, "Vice Chairman Highlights Importance of Nuclear Deterrence," *DoD News*, March 6, 2018, https://www.defense.gov/News/Article/Article/1459640/vice-chairman-highlights-importance-of-nuclear-deterrence/.

17. Keir A. Lieber and Daryl G. Press, "The Nukes We Need: Preserving the American Deterrent," *Foreign Affairs* 88:6 (November/December 2009), 40–42.

18. Michael Gerson and Daniel Whiteneck, *Deterrence and Influence: The Navy's Role in Preventing War* (Alexandria, VA: Center for Naval Analyses, March 2009); Desmond Ball, "Nuclear War at Sea," *International Security* 10:3 (Winter 1985–1986), 8.

19. Ball, "Nuclear War at Sea," 26–28.

20. As translated in Johnson, "Russia's Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds," 83. See also Zysk, "Escalation and Nuclear Weapons in Russia's Military Strategy," 1–12.

U.S. and Allied Strategies for Deterring Limited Nuclear War

To counter potential adversary strategies for limited nuclear war, the United States and its allies need escalation-management strategies of their own. For Russia, China, and North Korea, the United States requires tailored deterrence strategies that make crossing the nuclear threshold as distasteful as possible. These individualized strategies must be based on careful assessment of the adversary's interests, capabilities, strategic culture, doctrine, and decision-making proclivities, among other factors. Such an exercise is beyond the scope of this monograph. I close, however, with some guidance for effective strategies.

Focus on the Goal

Because we do not know the precise circumstances adversaries will face at the nuclear brink or how they will calculate costs and benefits, the U.S. goal should be to promote "nuclear-use stability" during potential limited conventional conflicts. Nuclear-use stability resides on a spectrum. In the most stable situation, neither combatant has an incentive to conduct nuclear strikes. This indicates that two conditions have been met. First, both combatants believe they can achieve an *acceptable* outcome in the conflict without crossing the nuclear threshold. Second, neither combatant believes it has a reasonable chance of markedly improving its political and military position—at a bearable cost—by crossing the nuclear threshold. In the most unstable scenario, a combatant is unwilling to accept the opponent's settlement terms and is confident that it can coerce a better offer by conducting limited nuclear strikes.

Present an Acceptable Alternative to Crossing the Nuclear Threshold

A key aspect of nuclear-use stability is that both parties must be confident they can achieve an acceptable outcome without resorting to nuclear use. The United States and its allies, therefore, need first to give adversary leaders an acceptable offramp to end a limited war. Second, the offer they extend the adversary must be perceived as credible. Third, for each potential conflict, the United States and its allies need to comprehend the settlement values in play—what the adversary would fight hardest to keep and what might be negotiated away.[1]

In the conflicts discussed, the United States would lead an allied effort to resist and, if necessary, roll back conventional aggression. If the United States and its allies are winning, they may be tempted to press their advantage to punish the adversary for initiating the conflict. In some circumstances, this may send an appropriate message to the adversary and other potential antagonists. The less favorable the outcome forced upon the adversary's leaders, however, the stronger their incentive to reach for improved prospects by crossing the nuclear threshold. As long as nuclear deterrence remains the goal, the United States and its allies must, at the very least, demonstrate that they will limit their ambitions so long as the adversary respects the nuclear firebreak. Potential limitations on U.S. and allied goals may include restoring the status quo ante and stopping short of regime change, or forgoing occupation so long as those responsible for instigating the conflict accept exile.

Equally important, the United States and its allies should ensure that their conventional war plans, and how they are discussed publicly, are consistent with the message they wish to send.[2] If the alliance has a limited objective of retrieving the status quo ante, its members must ensure that military operations are consistent with that objective and so perceived by the adversary. If the adversary interprets U.S. and allied conventional operations as the prelude to a more ambitious campaign—possibly with the objective of regime change—it will be more likely to cross the nuclear threshold.[3]

Finally, the United States and its allies must think through the details of potential settlements, including the tradeoffs and concessions required. What are the minimal demands of the United States and its

allies in plausible war-termination accords? Are there ways a territory or resources in dispute might be split? Are there postwar political and security arrangements that both sides would find acceptable? To answer these and other questions, U.S. and allied political and military leaders should prepare to end wars in the same way they prepare to fight them: by developing options, simulating scenarios, red teaming, etc.

Reduce the Benefits of Nuclear Escalation

The United States can also increase nuclear-use stability by reducing the suggestive and instrumental benefits of crossing the nuclear threshold. An adversary would be far less likely to employ nuclear weapons if it were convinced that doing so would significantly increase U.S. and allied resolve. Adversaries must perceive the nuclear threshold as something the United States and its allies not only prefer, but are willing to enforce at great cost. Toward this end, the United States frequently signals to adversaries that any nuclear use would fundamentally transform its interests in a conflict. The United States should continue to repeat this message, particularly in times of crisis, and encourage allies to express similar sentiments. To bolster allied support and resolve in the face of nuclear coercion, the United States should ensure that alliance members maintain a shared understanding of their common interests and political–military strategies.

The United States and its allies should increase the difficulty of seizing the initiative by crossing the nuclear threshold. The most worrisome concepts of limited nuclear escalation rely on the adversary's ability to significantly degrade the effectiveness of U.S. conventional operations while appearing somewhat reasonable and restrained. Unfortunately, U.S. general-purpose forces, according to the Defense Science Board, are not adequately prepared or equipped to operate effectively in a nuclear environment, which makes tank formations, headquarters, and everything in between attractive targets.[4] During the Cold War, the United States maintained hardening standards that required that most important conventional forces be able to operate under radiation and EMP effects. These standards have loosened with the perceived decline in the nuclear threat. Even worse, trends in the development of American military capabilities, such as the use of commercially-supplied technology in weapons systems and reliance on networked

capabilities and operations, are likely to increase the vulnerability of conventional operations to nuclear effects. These vulnerabilities might encourage adversary nuclear use, on the belief that they provide an opportunity for significant disruption of U.S. and allied operations.

Removing U.S. vulnerabilities will make crossing the nuclear threshold less attractive. The United States and its allies should ensure that critical military platforms, weapons, and equipment meet hardening standards, consider how to increase operational resilience (for instance, by maintaining geographically diverse and hardened air bases, ports, and headquarters), and train key conventional units to operate effectively in a nuclear environment. At the very least, these preparations would signal that the United States and its allies are prepared to keep fighting after the nuclear threshold is breached. In the event of a nuclear strike, the ability to sustain conventional operations and pursue campaign objectives on a nuclear battlefield will likely help the United States achieve its political and military objectives.

The United States and its allies should additionally pursue proven, cost-effective air- and missile defenses. Adversaries will be most tempted by nuclear strikes with important operational impacts that nevertheless appear very limited.[5] Deploying layered air- and missile defenses to protect key forces and military facilities would add significant uncertainty to the adversary's calculus by requiring a far larger strike to achieve the same probability of success. This execution of expansive nuclear strikes would make the attack appear less restrained, exacerbating fears of a forceful U.S. response.[6] Russian military documents show precisely this calculation as part of the reason the Kremlin objects to U.S. and NATO missile defense in Europe; missile defense inhibits the potential execution of calibrated nuclear strikes intended to pressure the United States and its allies to negotiate a cessation of hostilities.[7]

Increase the Likely Costs of Retaliation and Risk of Nuclear Escalation

The United States and its allies can strengthen nuclear-use stability by increasing both the costs the adversary would expect in crossing the nuclear threshold and the risk of further escalation. Adversary conflict-termination strategies depend on using nuclear weapons in a limited

way to improve a political and military position while preventing the conflict from escalating to a large-scale nuclear exchange. The United States must continuously assess each adversary's nuclear doctrine, capabilities, and exercises to determine the likeliest and most dangerous courses of action that might be pursued. Tailored deterrence strategies should be developed to offset those concepts for limited nuclear use that are most threatening to U.S. and allied war objectives. For many potential adversary concepts of limited nuclear use, the United States will not require a specific capability offset; signaling resolve to "fight through" with conventional forces to achieve campaign objectives will be sufficient. For extremely dangerous concepts that could alter the military balance of a conflict, the United States may need to threaten in-kind retaliation or escalation to change the calculus.

In some instances, the best response to adversary limited nuclear use would be to threaten significant non-nuclear retaliation. The United States and its allies might threaten to expand the military means they are using in a conventional campaign, or the types of operations. This would require keeping certain conventional operations in reserve, to be executed only if the adversary crosses the nuclear threshold. The conventional threat would have to be meaningful to the adversary and clearly conveyed. The United States might, for example, threaten to conduct counter-space operations or broaden the terrestrial battlefield if the adversary crossed the nuclear threshold. The efficacy of these threats would depend on the adversary's perception of its vulnerability, as compared to the expected benefits of limited nuclear strikes. The main strategic risk for the United States is that military operations that would otherwise make an important contribution to the conventional campaign might have to be held in abeyance. Depending on the adversary and conflict, the United States might not be able to afford this luxury.

The United States could also signal an intent to expand its war aims should the adversary cross the nuclear threshold. If the initial U.S. objective was to restore the pre-conflict territorial arrangement, for example, it could threaten to seek additional territory or even regime change to punish the adversary for employing nuclear weapons. The United States stated this explicitly in the 2018 *NPR*, warning that "any North Korean nuclear attack against the United States or its allies and partners is unacceptable and will result in the end of that regime."[8] By

making a public commitment, the United States put its reputation on the line, which makes crossing the nuclear threshold riskier for Pyongyang. On the other hand, publicly issuing such a threat constrains U.S. response options if North Korea is not deterred and proceeds with nuclear use. If the United States decided that its best approach was to continue prosecuting a limited war after North Korea crossed the nuclear threshold, it would be difficult to signal to the Kim regime that the United States was not pursuing regime change. For this reason, the United States would be foolish to threaten regime change were Russia or China to cross the nuclear threshold. More limited ways to threaten expanded war aims should be considered in cases where additional leverage is needed to deter nuclear use.

If non-nuclear threats would be impracticable or insufficient to change the escalatory calculus, threatening nuclear retaliation may play a central role in U.S. and allied deterrence. The United States has consistently communicated to potential adversaries that "unacceptable consequences" will redound on any adversary that uses nuclear weapons.[9] To back up the warning, the United States maintains a large, diverse arsenal of nuclear-armed ICBMs, SLBMs, ALCMs, and gravity bombs to inflict massive destruction on potential adversaries. But if these adversaries maintain robust, survivable nuclear capabilities of their own, they can threaten levels of damage against the United States that would exceed U.S. stakes in any potential regional conflict.[10] Thus the side likely to enjoy an advantage is not that which has the ability to deliver the most destruction at the highest level of nuclear escalation, but that which can manipulate nuclear risk at lower levels.

U.S. options for deterring adversaries by threatening nuclear escalation are discussed in next section.

References

1. Andrew J. Coe and Victor A. Utgoff, *Restraining Nuclear War* (Alexandria, VA: Institute for Defense Analyses, June 2011).

2. Vincent A. Manzo, "After the First Shots: Managing Escalation in Northeast Asia," *Joint Forces Quarterly 77* (April 2015), http://ndupress.ndu.edu/Media/News/Article/581877/after-the-first-shots-managing-escalation-in-northeast-asia/; Elbridge Colby, "America Must Prepare for 'Limited War'," *The National Interest* (November/December 2015), http://nationalinterest.org/feature/america-must-prepare-limited-war-14104.

3. Lieber and Press, *Coercive Nuclear Campaigns in the 21st Century*.

4. Defense Science Board, *Seven Defense Priorities for the New Administration* (Arlington, VA: Department of Defense, December 2016), 26–27.

5. Brad Roberts, "On the Strategic Value of Ballistic Missile Defense," Proliferation Papers, *Ifri* (June 2014), https://www.ifri.org/sites/default/files/atoms/files/pp50roberts.pdf.

6. On the other hand, U.S. and allied air and missile defense, from a strictly military perspective, may incentivize an adversary to conduct nuclear strikes. If defenses make it far more difficult for an adversary to successfully strike a high-value target, it may calculate that it needs the few missiles that do get through to cause significant damage.

7. Johnson, "Russia's Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds," 74.

8. Office of the Secretary of Defense, *Nuclear Posture Review 2018*, 33.

9. Office of the Secretary of Defense, *Nuclear Posture Review 2018*, 21.

10. Against smaller nuclear powers like North Korea, the United States may be able to maintain counterforce capabilities that would allow it to challenge the survivability of the adversary's nuclear forces. See Vince A. Manzo and John K. Warden, "The Least Bad Option: Damage Limitation and U.S. Deterrence Strategy toward North Korea," in "Policy Roundtable: Are There any Good Choices When it Comes to North Korea?" *Texas National Security Review,* February 7, 2018, https://tnsr.org/roundtable/policy-roundtable-good-choices-comes-north-korea/#essay6. Doing so against larger, technologically sophisticated nuclear powers like Russia and China is far more difficult. See Charles L. Glaser and Steve Fetter, "Should the United States Reject MAD? Damage Limitation and U.S. Nuclear Strategy toward China," *International Security* 41:1 (Summer 2016), 49–98.

U.S. Options to Deter by Threatening Nuclear Escalation

The United States can challenge an adversary strategy by altering the perception of the costs and risks of nuclear retaliation and escalation. The approaches below are by no means mutually exclusive and may be mutually reinforcing. If the adversary is uncertain how the United States will respond to a nuclear strike but sees great potential for arriving at a worse position, it will be less likely to cross the nuclear threshold.

Increase the Risk of Escalation Beyond the Adversary's Preferred Limitation

In most instances, the United States would prefer a strategy that deters nuclear escalation by shaking the adversary's confidence that it can maintain its preferred limitations in nuclear war. If an adversary doubts this ability, and its ability to align expected costs with the value of the issues at stake, it will be less likely to cross the nuclear threshold. The United States cannot credibly threaten *unlimited* retaliation in response to a limited use of nuclear weapons. It may, however, attempt to convince the adversary that it would *risk* escalation to large-scale nuclear war.[1]

One approach is for the United States to signal through declaratory policy and posture that it will not respect the adversary's preferred distinctions among levels of nuclear conflict. Attempts to differentiate tactical or theater nuclear war and strategic nuclear war depend on creating distinctions between the types and locations of the targets selected and perhaps the weapons and delivery systems used. Challenging these distinctions, Secretary Mattis recently stated that there

is no such thing as a "tactical" nuclear weapon and that any nuclear use would be a "strategic game-changer"—suggesting that a tactical use might invite a response from U.S. ICBMs, SLBMs, or bombers.[2]

To reinforce this message, the United States can develop capabilities and doctrine that link, rather than disaggregate, different levels of nuclear conflict. If the United States can convince an adversary that nuclear use at one level will very likely lead to retaliation at a higher level, the adversary will have far less confidence in its ability to control escalation. For example, the United States could warn of a prompt response to limited nuclear use against theater or battlefield targets by threatening strikes via a strategic delivery system against targets significant to the adversary.[3] Adversary decision makers may be rendered less confident that they can prevent a theater nuclear conflict from blowing up into strategic nuclear war.

A somewhat similar logic informed the U.S. decision to deploy intermediate-range nuclear forces in Europe during the Cold War. By deploying theater systems that could strike deep within the Soviet Union, the United States and NATO enhanced the perception that a nuclear war that began on a European battlefield would quickly expand into the Soviet homeland and risk nuclear war involving strategic forces.[4] As a result—the argument went—the Soviet Union would perceive a seamless path connecting conventional war in Europe, limited battlefield exchanges of nuclear weapons, and massive escalation. It would therefore be disabused of any illusion that nuclear war in Europe could be controlled on favorable terms.

But the limitations of this strategy were also understood during the Cold War. In an escalating conflict in Europe, would the United States really have conducted nuclear strikes deep in Soviet territory, knowing the risk of nuclear retaliation against the continental United States? And more critical, would the Soviets believe it? From the historical record, it seems that the Soviets found the U.S. threat credible enough; but there is no way of knowing whether the Kremlin would have made the same calculation in the midst of conflict.[5]

Today, Russia or another potential U.S. adversary would be less concerned about the possibility of uncontrolled escalation. The United States has reduced the role of nuclear weapons in its national-security strategy and retired the vast majority of its theater nuclear-weapons capabilities. Moreover, a U.S. decision to strike deep within adversary

territory would require a presidential decision, making it difficult for a U.S. leader to credibly threaten that a nuclear conflict would get out of control owing to pre-delegation or factors outside executive control. Would a U.S. leader risk responding to regional nuclear strikes with a homeland attack that might set off substantial nuclear escalation? The possibility would doubtless give an adversary pause. But if a regime is skeptical of U.S. resolve in the issues at stake, it might posit it can favorably manage nuclear escalation.

Threaten Controlled Counter-Escalation

A separate but related approach to challenging an adversary's concept of limited nuclear war is to threaten deliberate, controlled escalation. Rather than discredit an adversary's concept of limitation or threaten autonomous escalation, this approach threatens to raise nuclear warfare to a level where (1) the United States would have an advantage and (2) the United States could deter escalation to a large-scale nuclear war. If, for example, the adversary attempted to limit nuclear war by insisting on a distinction between nuclear strikes at sea and on land, the United States might threaten to raise nuclear war at sea to a broader, "theater" nuclear war, for which the United States is equipped with various nuclear-armed cruise missiles and gravity bombs for striking military targets on land.[6] At the same time, the United States would keep ICBMs and SLBMs in reserve to deter the adversary from escalating to strategic strikes on the American homeland. The goal is to threaten to shift the conflict to an area of advantage where the costs of adversary retaliation are tolerable while reserving significant forces to deter counter-escalation. This puts the decision to negotiate or escalate back on the adversary.

Calibrated escalation of this kind has two potential downsides. First, even if the United States succeeded in establishing a cap on nuclear escalation—in the example above, on "theater nuclear war"—it would still be inviting retaliation. At levels of nuclear warfare where the United States perceives it holds an advantage, an adversary may believe the opposite. Or the adversary may share the U.S. view of the balance but seek to test whether the U.S. alliance has the resolve to continue absorbing nuclear blows within the boundary established. In either case, the resulting limited nuclear war would likely have significant conse-

quences, potentially exceeding the value of any gains the United States might achieve through limited nuclear strikes. In addition, by clearly signaling restraint, the United States would validate the adversary's belief that nuclear escalation can be controlled. If the adversary thinks there is a still higher level of nuclear escalation where it will enjoy the advantage, it will have incentive to take the conflict there.

The United States should therefore be judicious as to when and how it threatens calibrated escalation. U.S. threats to raise the level of nuclear conflict will be most credible when the adversary perceives that the United States has a substantial stake in the conflict, the United States has a clear advantage under its preferred rules for nuclear operations, and the adversary has no attractive option for counter-escalation.

Counter the Adversary's Perceived Nuclear-Capability Advantage

A final U.S. approach is to deny the adversary the advantage under the conditions of limited nuclear conflict that it is most likely to seek. This could be accomplished by deploying additional U.S. capabilities, limiting adversary capabilities through arms control, or both. In certain instances, the United States will identify a particularly threatening adversary concept of limited nuclear conflict—an area of nuclear warfare where the adversary might achieve a significant operational impact, where the United States lacks military capabilities to respond effectively, and where U.S. counter-escalation would be costly or risky. In such cases, the United States would nonetheless *not* need to match every adversary capability. Rather, it would need a credible posture that would enable it to counter the adversary's military strategy or impose costs that would outweigh potential battlefield gains below the limit on nuclear warfare that the adversary might establish.

The United States will need to continuously revisit the nuclear limitations that each potential adversary could employ to determine where adjustments to the U.S. nuclear posture are required.[7] An adversary's potential advantages might derive from asymmetries in the number, capability, or posture of nuclear forces under certain conditions of warfare. If the United States and an adversary wielded equivalent nonstrategic nuclear-weapons capabilities, but those of the United States were vulnerable to preemption, then the adversary might calculate that by

striking first it can set the conditions for a favorable limited nuclear war. Alternatively, the adversary's advantage might derive from an asymmetry in the relationship between the potential effects of nuclear use in a specific conflict. If the capabilities of both combatants are comparable, but the adversary can use certain nuclear weapons to greater operational effect, it may perceive an exploitable advantage.

To counter important areas of adversary capability advantage, the United States could augment its own nuclear forces or limit adversary capabilities by means of arms control. In pursuing additional capabilities, the objective is to demonstrate that even within the adversary's preferred bounds for limited nuclear warfare—whether at sea, tactical, theater, or something else—the United States has effective options for leaving it worse off than before, either by offsetting the military advantages anticipated through limited nuclear strikes or by destroying assets. Concerning arms control, the U.S. objective would be to negotiate agreements that restrict or eliminate capabilities that may potentially provide the adversary an advantage under important tacit conditions for limited nuclear warfare. Because an adversary is unlikely to voluntarily cede an important advantage, it will likely only agree to and continue to enforce reciprocal agreements that restrict similar U.S. capabilities as well. As a result, in areas where the adversary has an advantage, the United States will likely need to pursue additional nuclear capabilities to generate leverage.

Before pursuing supplemental nuclear capabilities, the United States must consider potential downsides.

First, new capabilities are beneficial only if they create an enduring improvement in the U.S. position relative to potential adversaries. If the United States triggers an adversary buildup that it cannot match, resources will have been wasted and tensions increased without improvement to the deterrence posture.

Second, the pursuit of additional nuclear capabilities must not entail significant tradeoffs with conventional warfighting capabilities, whether because of finite resources for procurement, burdensome training requirements for nuclear missions, a forced choice between conventional and nuclear load-outs, or disadvantageous changes in how critical platforms would need to operate in wartime. Shoring up nuclear deterrence while weakening conventional deterrence would make war more likely.

Third, additional nuclear capabilities will contribute to deterrence only if they are supported by U.S. allies. If allies balk at the deployment of new capabilities and believe that the United States, rather than an adversary, is setting off a nuclear-arms race, political relationships will become strained. In the worst case, lack of cohesion from infighting over nuclear developments would make an alliance appear vulnerable. In this way, strengthening capabilities may ultimately weaken deterrence.

For these reasons, the United States must be discerning in selecting which supplemental nuclear capabilities to pursue, keeping in mind internal tradeoffs and external reactions. Efforts to counter an adversary's perceived capability advantage will be most effective when (1) new capabilities significantly enhance the U.S. deterrent posture in a way difficult for the adversary to offset, (2) there is limited opportunity cost for U.S. conventional deterrence, and (3) the United States and its allies are in agreement.

References

1. Schelling, *Arms and Influence*, 92–125; Schelling, *The Strategy of Conflict*, 187–203.

2. Aaron Mehta, "Mattis: No Such Thing as a 'Tactical' Nuclear Weapon, But New Cruise Missile Needed," *Defense News,* February 6, 2018, https://www.defensenews.com/space/2018/02/06/mattis-no-such-thing-as-a-tactical-nuclear-weapon-but-new-cruise-missile-needed/.

3. Frank Miller, "Addressing Fears About the Nuclear Posture Review and Limited Nuclear Use," *War on the Rocks,* February 28, 2018, https://warontherocks.com/2018/02/addressing-fears-nuclear-posture-review-limited-nuclear-use/.

4. McNamara, "The Military Role of Nuclear Weapons."

5. Hines, Mishulovich, and Shull, *Soviet Intentions 1965–1985*.

6. During the Cold War, the United States attempted to disabuse the Soviet Union of the idea that a nuclear war would remain at sea by threatening retaliatory strikes on land. See Ball, "Nuclear War at Sea," 8–10.

7. In the 2018 *NPR*, the Department of Defense assesses that the distinction Russia might draw between low-yield, theater nuclear warfare and high-yield, strategic nuclear warfare requires supplemental U.S. nuclear capabilities. *NPR* recommends that the United States continue with its plans to recapitalize its nuclear-capable bombers, dual-capable fighter-bombers, air-launched cruise missiles, and nuclear gravity bombs; add a low-yield weapon on select SLBMs; and explore a sea-launched cruise missile (SLCM). See Office of the Secretary of Defense, *Nuclear Posture Review 2018*.

Conclusion

Limited nuclear war is a terrifying possibility that most Americans prefer to ignore. But as the United States shifts its focus back to great-power competition, it must account for the important role that nuclear weapons play in adversary strategies for war against the United States and its allies. Through various security guarantees, the United States seeks to protect its allies from armed aggression; meanwhile Russia, China, and North Korea aspire to forcefully revise regional realities to further their interests. Post-World War II history demonstrates that the existence of nuclear weapons does not prevent these competitions and will not eliminate the eruption of conflicts that might escalate to nuclear war.

From the American perspective, there is little benefit to introducing nuclear weapons into a conflict, but enormous downside risk. The United States is likely to have the advantage when fighting below the nuclear threshold, and there is significant risk that escalating nuclear conflict would result in costs that overbalance U.S. stakes.

Russia, China, and North Korea face an entirely different strategic situation. In a regional conflict, these states are likely to face the United States as an opponent that is conventionally superior but fighting far from home over less-than-vital interests. In certain circumstances, U.S. adversaries may calculate that nuclear escalation is a worthwhile gamble.

Just how likely any U.S. adversary is to cross the nuclear threshold in a regional conflict is difficult to ascertain. But we do know that Russia, China, and North Korea are developing capabilities and concepts that, to various degrees, will allow them to employ nuclear weapons while also damping escalation. As these countries continue to upgrade and diversify their nuclear arsenals, they gain more options for conducting limited nuclear strikes while managing escalatory risk. And the

more confident adversaries are in their ability to use nuclear strikes to maximize postwar benefits while limiting wartime costs, the more likely they are to cross the threshold.

Against this threat, the United States and its allies need deterrence strategies tailored to each potential adversary. If limited nuclear war is never to be fought, then the United States and its allies must prevent their adversaries from thinking it can be won. There is no universal blueprint for deterring nuclear use, but there are principles that can be profitably adapted to narrow circumstances. The concepts presented here are a starting point, to be rounded out by deep analysis of specific adversaries and scenarios, vigorous efforts to develop strategies and acquire needed capabilities, and continuous evaluation of the adequacy of the U.S. deterrence posture toward each potential adversary.

The United States and its allies will have fully achieved the goal of mitigating the risk of limited nuclear war when our adversaries are no longer (1) investing in tactical or theater nuclear capabilities optimized for limited nuclear warfare, (2) conducting training and exercises focused on theater nuclear strikes, or (3) issuing public statements and strategy documents that highlight nuclear escalation as a path to victory in regional conflict. Partial success will be achieved if, though the United States and its allies fail to dissuade adversaries from developing limited nuclear options, we succeed in deterring the exercise of those options in war.

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government or Lawrence Livermore National Security, Inc. LLNL-TR-753807

“How to favorably manage escalation against nuclear-armed opponents is one of the truly central and also most difficult challenges for U.S. security strategy. In this sophisticated, lucid monograph, John Warden makes an important contribution to advancing our understanding of how we might go about addressing this crucial problem. Warden's deep understanding and his useful proposed framework offer strategists and analysts a valuable construct for approaching how the United States can deter and, if necessary, prevail in a limited nuclear war.”

Elbridge Colby
Director of the Defense Program, Center for a New American Security
Former Deputy Assistant Secretary of Defense for Strategy and Force Development

“In 2018, both the National Defense Strategy and Nuclear Posture Review highlighted the problem of coercive nuclear strategies being adopted by rivals to the United States and the need for effective counters to such strategies. The task of developing such counters will be immensely aided by the work John Warden presents here. Warden helps us move beyond admiring the problem of regional nuclear escalation and toward a coherent response by articulating a carefully considered analytic framework. This framework deconstructs the dynamics of regional conflict under a nuclear shadow, the calculations particular adversaries are likely to make as they contemplate escalation, and the ways in which these actors will seek to contain the risks and maximize the benefits of the limited use of nuclear weapons. Just as important, Warden outlines the options U.S. leaders will have to deter and frustrate these strategies, providing the foundations of a policy and planning blueprint whose further development should be considered an urgent task. This monograph will certainly not be the last word on this topic, but it greatly advances our thinking on an urgent and complex challenge and offers an excellent example of how rigorous analysis can clarify and shape the choices before us.”

Paul Bernstein
Senior Research Fellow, Center for the Study of WMD, National Defense University

---

The mission of the Center for Global Security Research is to catalyze broader national and international thinking about the requirements of effective deterrence, assurance, and strategic stability in a changed and changing security environment.

To learn more please visit our website: **cgsr.llnl.gov**

CGSR
Center for Global Security Research

Lawrence Livermore National Laboratory