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BACKGROUNDER

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Learning to Love the Bomb? Non-Strategic Nuclear Weapons and Limited Nuclear War

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KEY TAKEAWAYS

The idea that nuclear war always leads to an uncontrolled nuclear exchange is an assumption not rooted in evidence.

It is possible that nuclear-armed adversaries could engage in a protracted nuclear war that remains limited.

Tabletop exercises and computer simulations could provide new insights into how limited nuclear wars might unfold and be fought.

Defining Limited Nuclear War

> There is a tendency in our planning to confuse the unfamiliar with the improbable. The contingency we have not considered seriously looks strange; what looks strange is thought improbable; what is improbable need not be considered seriously.
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> —Thomas C. Schelling, preface to Albert Wohlstetter, *Pearl Harbor: Warning and Decision* (1962)

Limited nuclear war may be unfamiliar, but it is not improbable. For many years, there existed an assumption among the general public and even among many influential defense policymakers that the destructive power and escalatory potential of atomic weapons meant they could be useful only as a deterrent—not

for actual battlefield employment.[1] Further, many assumed that any attempt to "limit" nuclear war would ultimately prove impossible: The belligerents would eventually resort to large-scale strategic use and thereby achieve the complete annihilation of the adversary.[2] This popular assumption, therefore, was that either side in a nuclear conflict would seek to impose as much damage on its adversary as possible, as quickly as possible, in order to limit the damage to itself.

On its surface, the history of the Cold War appears to validate this thesis. Despite elaborate plans and exquisite capabilities developed for limited, theater-range nuclear warfighting, many political leaders on both sides of the Iron Curtain concluded that they should pursue military objectives by conventional means and that any use of non-strategic nuclear weapons (NSNWs) would risk triggering a catastrophic strategic exchange.[3]

However, the hypothesis that NSNWs—which are relatively lower in explosive power and yield and generally delivered on theater-range delivery systems, as opposed to strategic nuclear weapons, which are generally very high-yield and can be delivered anywhere by way of long-range missiles or strategic bombers—could never be used is a value judgment. Many strategic theorists questioned the notion of an "absolute weapon" and suggested that limited nuclear warfighting (that is, with aims short of the destruction of the adversary's nation or even the adversary's nuclear forces) could prove strategically rational—and therefore highly attractive during a high-intensity conflict.[4]

The fact that the current geostrategic context has changed radically since the Cold War is another consideration. America and its allies now face multiple simultaneous regional contingencies in which high-precision, low-yield NSNWs could be employed to achieve limited but still critical effect. In other words, limited nuclear war is not only possible; it is increasingly attractive—particularly given the newfound interests that America's enemies have in low-yield, theater-range NSNWs. It is imperative, therefore, that analysts examine how such a conflict could start, be fought, and even be won.

How a Limited Nuclear War Could Begin

Initiating a limited nuclear conflict could prove a strategically rational decision if a leader judged that the prospective benefits of NSNW employment outweighed the risks of a general nuclear exchange, as well as the costs of not pursuing other courses of action, including inaction.

As one scholar has suggested,[5] NSNW employment could degrade the adversary's ability to command and control theater forces, deploy surge

forces to the battlefield, or project air and naval power in the conflict area. Further, it could weaken an adversary's resolve both by increasing the credibility of threats of further nuclear employment or escalation and by increasing the prospects of a strategic nuclear exchange.

The current geostrategic environment offers an increasing number of scenarios for such a contingency. The United States faces three nuclear-armed adversaries that could initiate a high-intensity regional conflict with Washington and its allies. In the event that Moscow, Beijing, or Pyongyang failed to prevail through conventional means in such a conflict, they may use NSNWs due to a perceived asymmetry of stakes: the belief that Washington's reluctance to risk escalation to the nuclear—particularly in the defense of an ally—would provide them with coercive leverage.[6]

This is particularly true given that Russia fields up to 10 times the number of NSNWs as does NATO. Meanwhile, the United States removed the last of its NSNWs from the Indo–Pacific in 1991 and retired the low-yield nuclear variant of the Tomahawk cruise missile almost 15 years ago. In this sense, nuclear-armed autocrats could believe that not only would they have a *greater stake* than the United States would in a regional context but that their advantage in theater-range, low-yield NSNWs would enable them to prevail in a conflict that the United States is ill-suited to fight.[7]

Russia's "escalate to de-escalate" doctrine specifically envisions employing NSNWs to achieve war termination in a conventional conflict in a regional context. In a war with NATO, this strategy could enable the Kremlin to push Article 5 to its breaking point.[8] Meanwhile, China's concept of "effective control" envisages preemptively increasing the scale and scope of violence to compel an adversary to retreat. This logic could conceivably lead to the employment of NSNWs in a conflict over Taiwan against the United States or some other regional U.S. ally or partner.[9] Pyongyang's threats of preemptive nuclear use, combined with its development of tactical nuclear capabilities, suggest that it, too, seeks the ability to fight and win in a limited nuclear war in the Korean Peninsula.[10]

Such views about the limitability of nuclear war are not completely irrational. Nor are they without precedent. As Thomas Schelling wrote:

> Will any nuclear war, no matter how it starts, or where it starts or on what scale it starts inevitably escalate to a huge intercontinental war? Certainly not inevitably. I really think it's doubtful whether even a nuclear war that began in some theatre would escalate to a large-scale intercontinental nuclear exchange.... But, you see, if you just ask the question, would anybody initiate the use of nuclear weapons on a small scale, if he expected it to escalate, the answer must

> be "no." If you expect it to escalate, you're wasting the opportunity to start the big war on your own terms. You're simply giving the enemy the chance to reciprocate in a manner of his choosing.[11]

Similarly, another Cold War–era nuclear theorist pointed out that "decision makers do not see a clear line that, once crossed, would definitely produce total war. Thus, the threat to use limited violence has at least some credibility; implementing it is not tantamount to committing national suicide."[12]

Nor are such thoughts limited to the Cold War. As Elbridge Colby, the current Under Secretary of Defense for Policy, noted in 2021, a nuclear war is unlikely to expand to an uncontrolled exchange if neither side has existential stakes in the outcome of the conflict.[13] One contemporary nuclear theorist offers that a nuclear war could stay limited if (1) both sides believe that nuclear war *can* stay limited, (2) both sides *want* it to stay limited, and (3) both sides *see evidence* that the other side wants it to be limited.[14]

The real risk of a limited nuclear war being possible is compounded by the separate but related "two-peer" problem of simultaneously deterring two adversaries with nuclear arsenals comparable to the United States.[15] The above-noted numerical decline in U.S. theater-deployed NSNW capabilities relative to the nuclear-armed autocrats may well lower the perceived risks of escalation among Washington's adversaries by creating the assumption that the United States would not threaten to use more than a portion of its nuclear force in a conflict with any one nuclear-armed adversary so as to retain at least an equally sized force to deter another nuclear-armed adversary in the aftermath of a putative nuclear exchange. Consequently, a crisis or conflict between Washington and one of its nuclear peers could create a window of opportunity for an adversary to initiate a limited nuclear war, either opportunistically or as part of a deliberately coordinated strategy.[16]

Operational and technological developments could further incentivize deliberate nuclear escalation. The dual-use nature of key American long-range precision-strike platforms, especially the B-2 bomber, could create the perception of an impending disarming first strike during a conventional conflict with America and trigger Russian or Chinese nuclear use through the "reciprocal fear of surprise attack."[17] In addition, emerging and disruptive technologies might create a "nuclear-conventional crossfade," whereby conventional systems with strategic effects—such as space-based weapons, strategic cyberattacks, and hypersonic missile barrages—could be perceived as more harmful to strategic stability than limited nuclear use.[18]

Washington's extended deterrence commitments—whereby it guarantees the sovereignty of its closest allies through its nuclear umbrella—may

well cause an American President to respond in kind to a limited nuclear attack against not only itself but also one of its treaty allies. A failure to do so could cast doubt over the integrity and the validity of the U.S. nuclear umbrella, along with America's credibility as an international security provider. Put another way, America's allies and partners would likely conclude that they had to pursue their own indigenous strategic deterrents or face reduced regional influence and an impaired ability to deter adversaries in the future.[19]

In short, limited nuclear war could begin through deliberate escalation. Nuclear use need not arise from an inadvertent miscalculation or freak accident but may instead represent a rational choice rooted in strategic logic and the political-military context.

How a Limited Nuclear War Could Unfold

Once initiated, a nuclear war could remain limited if all sides convinced each other that they would observe concrete, practical restraints, contingent upon their adversaries doing likewise.[20] Such constraints could include refraining from targeting each other's political leadership, population centers, or internal regime control organizations. Though some have supposed that belligerents' mutual uncertainty about the others' intentions would render such an outcome infeasible, such an assumption paints an impossibly simple picture of various actors' escalation calculi.[21] It suggests that after crossing the nuclear threshold, national leaders would cease any consideration of the risks of triggering a strategic exchange and would instead focus exclusively on eliminating their adversaries' regimes or societies. It is more plausible that all sides would share the same imperative of avoiding mutual holocaust and therefore seek to conduct nuclear strikes that maximized their chances of ending the war on favorable terms while minimizing the risks of catastrophic retaliation or a high-intensity strategic attack on each other's homelands.[22] This could be accomplished by a combination of high-accuracy, low-yield NSNWs and a selective targeting policy that restricted their use to non-existential but still critical targets, such as command-and-control nodes, military headquarters, militarily relevant forces, or key warfighting enablers.

As some scholars have demonstrated, a five-kiloton warhead with a circular error probability of 50 meters could destroy a hardened mobile missile shelter without creating significant fallout effects. Indeed, most nuclear-armed countries have deployed short- and medium-range ballistic missiles with this level of accuracy.[23] Consequently, a small

number of NSNWs would prove effective against a range of hardened or dispersed targets. One or two warheads would suffice for an electromagnetic pulse or demonstration strike, and a few dozen NSNWs could eliminate a range of conventional military targets. In fact, the use of 50 U.S. nuclear weapons against larger countries such as China or Russia would place less than 1 percent of their territories within the lethal radii of blast effects.[24]

Non-strategic nuclear warfighting would also require targeting policies that avoid triggering a strategic exchange. U.S., Russian, and Chinese nuclear doctrines all prioritize escalation control and indicate that they would employ their nuclear arsenals selectively.

Since the 1960s, American nuclear doctrine has generally eschewed massive retaliation in favor of flexible response.[25] The most recent report on U.S. nuclear employment strategy stated that "all plans for responding to limited nuclear attack...include an associated concept of favorably managing escalation, including reducing the likelihood of a large-scale nuclear attack against the United States or its allies and partners," and it explicitly ruled out countervalue targeting.[26] Similarly, Russian (and to a lesser extent, Soviet) targeting doctrine has traditionally aimed to inflict "unacceptable damage" on an adversary using the lowest numbers and damage levels possible.[27] Moreover, as one Russian strategist points out, there is increasing interest in "tailored damage"—a predetermined, calibrated level of damage designed to be unacceptable to an adversary.[28] Chinese thinking describes a "key-point counter-attack": a highly selective retaliation aimed at a handful of "vital site targets" (command centers, ports, major cities) to "control the war situation."[29] Furthermore, as the 2023 U.S. Department of Defense report to Congress noted, Chinese military writings in 2021 suggested that new precise small-yield nuclear weapons could possibly allow for the controlled use of nuclear weapons for warning and deterrence.[30]

In sum, the technological capabilities and the declaratory policies of America and its prospective adversaries could provide the basis for fighting a limited nuclear war. At the most basic level, nuclear strikes could be restricted to military targets, thereby avoiding the indiscriminate destruction of population centers. Moreover, these strikes could themselves exclude strategic delivery systems and nuclear command, control, and communications and be limited to specific categories of theater targets, such as naval platforms, troop formations, or logistical hubs.[31]

War Termination: Theories of Victory in a Limited Nuclear War

If escalation were controlled sufficiently to avert a strategic exchange, war termination would be possible. The limited but still critical nature of the political objectives that caused non-strategic nuclear war to break out in the first place suggests that belligerents may be satisfied with coercing their adversaries into abandoning their initial war aims or accepting defeat in a conflict rather than demanding unconditional surrender or societal destruction. As Henry Kissinger recognized in 1958: "[S]uccess in limited war requires...that the opponent be persuaded that national survival is not at stake and that a settlement is possible on reasonable terms."[32] Hostilities could therefore reach a point at which the side that judged the costs and risks of continued conflict to be unacceptably high would capitulate on the terms set by its adversary.[33]

Achieving this outcome would require a theory of victory—a coherent set of principles for overcoming an adversary.[34] Escalation dominance and counter-escalation represent two plausible paradigms. The former aims to shift the burden of responsibility for escalating to unacceptably higher levels of violence onto an opponent.[35] Demonstrating the capability and the will to escalate toward the strategic level—including by fielding high-yield, low-precision systems and conducting indiscriminate countervalue strikes—could convince an adversary that the risks of continued nuclear warfighting are intolerably high. The alternative, counter-escalatory approach attempts to minimize the perceived benefits of further non-strategic nuclear use in the mind of an adversary.[36] This could be accomplished through damage limitation policies that reduce the operational effectiveness of nuclear strikes, such as missile defense, along with offsetting capabilities in conventional, space, and electronic warfare. Neither strategy would be mutually exclusive: Belligerents could pursue both simultaneously to maximize their respective asymmetric advantages.

In the Euro-Atlantic, the overwhelming size of Russia's non-strategic nuclear arsenal (~1,800 warheads in 2023 compared to NATO's ~150) would make escalation dominance the obvious choice for Moscow.[37] The Kremlin has already shown an inclination toward this approach by deploying Iskander systems to Belarus and using conventionally armed intercontinental ballistic missiles against Ukraine. In contrast, NATO's Aegis and Patriot ballistic missile defense systems would provide the Alliance with a strong capacity for counter-escalation. Indeed, the latter's efficacy against Russian missiles has been repeatedly demonstrated during the war in Ukraine. It is

unlikely that the 150 or so B61-12 gravity bombs—now paired with F-35A squadrons, along with a handful of submarine strategic missiles on U.S. and U.K. ballistic missile submarines—would suffice to establish escalation dominance: This would require an extremely aggressive targeting strategy involving preemptive nuclear use and would thus likely trigger the limited nuclear war that NATO would otherwise be trying to avoid due to Russian theater NSNW dominance.

In the Indo–Pacific, the picture is more complex. While China's traditional reliance on long-range conventional precision-strike (and potentially space) capabilities would make counter-escalation a plausible theory of victory, this could be changing.[38] The rapid expansion of China's stockpile of nuclear-capable DF-26 intermediate-range ballistic missiles could incline Beijing more toward escalation dominance, especially as Washington steps up cooperation with regional allies to strengthen its conventional deterrence posture.[39] In contrast, the two-peer nuclear challenge is undermining Washington's ability to credibly threaten to escalate toward the strategic level. Until the new nuclear-armed sea-launched cruise missile enters service in the early 2030s, America will lack a clear edge in non-strategic systems over China. Consequently, the United States must either rely on the low-yield variant of the W76 warhead (the W76-2) on the Trident II D5 missile and potentially arm some of its nuclear-capable aircraft deployed to the region with nuclear gravity bombs or pivot toward a counter-escalation posture sustained chiefly by its missile defense capabilities.

In short, Washington faces two nuclear rivals whose qualitative advantage in NSNWs could incline them to initiate a limited nuclear war in the belief that they could prevail through escalation dominance. Such a conflict would not inevitably lead to Armageddon. Rather, the belligerents would exploit the risk of such an outcome to create intra-war deterrence.[40] As Schelling perceived in 1961, prevailing in sub-strategic brinkmanship would mean convincing an adversary that "that the risk of a strategic exchange is great enough to outweigh their original objectives, but not so great as to make it prudent to initiate it preemptively."[41] This could result in an extended war of attrition lasting weeks or even months. If neither side proved willing to negotiate or escalate, belligerents would find themselves locked in a stalemate. Alternatively, one side could eventually generate and exploit a decisive strategic advantage, potentially by exploiting synergies between nuclear and non-nuclear warfighting. This would produce an asymmetry of costs, which could eventually compel an adversary to yield: Even beyond the nuclear threshold, conditional capitulation would still prove preferable to national suicide.

The Delicate Balance of Terror

Limited nuclear war is a possibility grounded in strategic logic and a probability accentuated by the current geopolitical and military context. Such a conflict could be started, fought, and won—and the nuclear-armed autocrats may well be planning for just such a war. Planning for limited nuclear war is necessary not only to buttress the credibility of non-strategic nuclear deterrence but also to ensure adequate preparation for a real contingency. This conclusion is neither deterministic nor fatalistic—it simply recognizes that deterrence is not automatic and that America's adversaries may consider limited nuclear war a "rational act of aggression."[42] The balance of terror is delicate indeed.

Strategic theory and political-military analysis will take us only so far, however. The fact that a limited nuclear war has never been fought renders any conclusions about it inevitably provisional and difficult to test empirically. It should not be dismissed out of hand as implausible and therefore unlikely.

Analytic wargaming and artificial intelligence offer new possibilities for plugging this methodological gap. Tabletop exercises (TTXs) recording the behavior of an elite population can illuminate decision-making dynamics in a hypothetical limited nuclear war. Moreover, computer-enabled large language models (LLMs) using data from TTXs could rerun scenarios hundreds of times and adjust the variables to explore alternative outcomes. This hybrid approach would create new and complementary datasets: The TTX would capture the creativity and unpredictability of human strategic interactions, while the LLMs would provide the scale and detail necessary for understanding large and complex geopolitical phenomena. As Kissinger predicted in his final book, *Genesis*: "Our strongest creations, acting as countervailing forces, could be better equipped than humans to exert and maintain an equilibrium in global affairs inspired (but not constrained) by human precedent."[43]

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Endnotes

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6. See B. Roberts, *The Case for U.S. Nuclear Weapons in the 21st Century* (Stanford: Stanford University Press, 2015); B. Roberts, "On Theories of Victory, Red and Blue," Center for Global Security Research, June 2020, and B. Roberts, "Limited Nuclear War, Extended Deterrence, and Counterforce," in B. Roberts, ed., *Counterforce in Contemporary U.S. Nuclear Strategy* (Livermore, CA: Lawrence Livermore National Laboratory, 2025), pp. 144–151.
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10. See T. Watanabe, "North Korea's Doctrine of Nuclear Preemption," National Institute for Defense Studies, August 2024.
11. T. C. Schelling, as quoted in "War and Peace in the Nuclear Age: Interview with Thomas Schelling, 1986," American Archive of Public Broadcasting, March 4, 1986, https://openvault.wgbh.org/catalog/V_5293F77426B84C68A360BD6283ACF4FC (accessed July 14, 2025).
12. R. Jervis, *The Meaning of the Nuclear Revolution* (Ithaca, NY: Cornell University Press, 1989).
13. E. A. Colby, *The Strategy of Denial* (New Haven, CT: Yale University Press, 2021).
14. See M. Costlow, "Restraints at the Nuclear Brink: Factors in Keeping War Limited," *NucleCast*, September 14, 2023, https://rss.com/podcasts/nuclecast-podcast/1119446/ (accessed July 14, 2025).
15. China's arsenal has rapidly expanded from about 300 deployed warheads in 2020 to 600 currently and is due to reach 1,500 by 2035. For more, see A. Péczeli, "Managing Escalation: America's Two-Peer Nuclear Problem," *Survival*, Vol. 67, No. 3 (2025), pp. 25–48, https://doi.org/10.1080/00396338.2025.2508079 (accessed July 14, 2025).
16. G. Weaver, "If Deterrence Fails: Analyzing U.S. Options for Responding to Adversary Limited Nuclear Use," in *Project Atom 2024: Intra-War Deterrence in a Two-Peer Environment* (Center for Strategic and International Studies, 2024), and V. Narang and P. Vaddi, "How to Survive the New Nuclear Age: National Security in a World of Proliferating Risks and Eroding Constraints," *Foreign Affairs* (July/August 2025).
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20. See Osgood, *Limited War*, p. 255.
21. See Freedman, *The Evolution of Nuclear Strategy*, pp. 100–110.
22. See Gray, "Nuclear Strategy," p. 62. See also Kissinger, *Nuclear Weapons and Foreign Policy*, p. 144.
23. K. A. Lieber and D. G. Press, *The Myth of the Nuclear Revolution: Power Politics in the Atomic Age* (Ithaca, NY: Cornell University Press, 2020), p. 77.

24. Fallout effects could be substantially mitigated by airburst rather than groundburst strikes, though this would not be feasible for NSNWs launched from air platforms or against hardened ground targets. For more, see B. W. Bennett, "On US Preparedness for Limited Nuclear War," in Larsen and Kartchner, *On Limited Nuclear War in the 21st Century*, pp. 211–244.
25. The main exception is Robert McNamara's pursuit of assured destruction, which considerably reduced the flexibility in strategic attack options, even though a range of limited options did remain part of official U.S. operational doctrine in the Single Integrated Operational Plan. For more, see D. A. Rosenberg, "Constraining Overkill: Contending Approaches to Nuclear Strategy, 1955–1965," paper presented at the Colloquium on Contemporary History No. 9, "More Bang for the Buck: U.S. Nuclear Strategy and Missile Development, 1945–1965," Naval Historical Center, U.S. Navy, January 12, 1994, http://www.history.navy.mil/colloquia/cch9b.html (accessed July 14, 2025).
26. U.S. Department of Defense, *Report on the Nuclear Employment Strategy of the United States*, p. 3.
27. M. Albertson, "Counterforce and Countervalue Targeting in Soviet and Russian Nuclear Strategies," in Roberts, ed., *Counterforce in Contemporary U.S. Nuclear Strategy*. The Soviets did theorize about limiting "dosage" in the mid-1970s and may have incorporated theater nuclear strikes in their doctrine but never to the same extent as their American counterparts. For more, see D. Adamsky, *The Russian Way of Deterrence: Strategic Culture, Coercion, and War* (Stanford: Stanford University Press, 2023).
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29. Academy of Military Science (China), "Science of Military Strategy," in *In Their Own Words: Foreign Military Thought* (China Aerospace Studies Institute, 2021), and Beauchamp-Mustafaga et al., "Denial Without Disaster."
30. U.S. Department of Defense, *Military and Security Developments Involving the People's Republic of China: A Report to Congress*, October 19, 2023, p. 112.
31. See Warden, "Limited Nuclear War," pp. 30–37 for an extensive discussion of this.
32. Kissinger, *Nuclear Weapons and Foreign Policy*, pp. 140–142.
33. Roberts, "On Theories of Victory, Red and Blue," p. 26.
34. Ibid., p. 4.
35. See Kahn, *On Thermonuclear War*, pp. 196–213.
36. Roberts, "On Theories of Victory, Red and Blue," pp. 64–66, and Kissinger, *Nuclear Weapons and Foreign Policy*, pp. 140–142.
37. H. M. Kristensen et al., "Russian Nuclear Weapons, 2023," *Bulletin of the Atomic Scientists*, Vol. 79, No. 3, pp. 174–199, https://doi.org/10.1080/00963402.2023.2202542 (accessed July 14, 2025).
38. See F. S. Cunningham, *Under the Nuclear Shadow: China's Information-Age Weapons in International Security* (Princeton: Princeton University Press, 2025).
39. U.S. Department of Defense, *Military and Security Developments Involving the People's Republic of China 2024: Annual Report to Congress*, December 18, 2024, pp. 77–78 and 123.
40. Kahn, *On Escalation*, pp. 200–211.
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42. See Wohlstetter, "The Delicate Balance of Terror," pp. 211–234.
43. H. A. Kissinger et al., *Genesis: Artificial Intelligence, Hope, and the Human Spirit* (Little, Brown and Company, 2024), p. 120.