



Tempting Armageddon: The Likelihood of Russian Nuclear Use is Misconstrued in Western Policy

Summary

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06 February 2023

Beginning with its invasion of Ukraine, Moscow has warned of the possibility of nuclear conflict and world war should US-NATO become directly involved in the fight.¹ While US-NATO leaders have said that these threats must, as a matter-of-course, be taken seriously, they have as a *matter-of-policy* treated the prospect of Russian nuclear use as very unlikely and easily contained. On balance, Western opinion leaders have treated Moscow's talk of nuclear use more as a scare tactic than a practicable option.² *This is a serious mistake - and one likely to increase the risk of the outcome it minimizes.*

Official US and NATO estimates of the likelihood of Russian nuclear use underestimate the risk for several reasons:

- First, official assessments evince a poor understanding of Russian thinking on extended nuclear deterrence, and they fail to see how and why it is evolving.
- Second, they lack the "strategic empathy" essential to weighing Russian motivations. They discount Moscow's view of the present contingency as an instance of big power contention and how it took a decisive turn beginning in 2014. They depreciate Moscow's long-felt conviction that NATO's approach to Russia's border threatens the stability and security of the Russian state.³ And they offhandedly dismiss Moscow's view that Kyiv's ongoing success in the war is due substantially to Western support, making the war a proxy Russia-NATO conflict.

None of these Russian perceptions or assessments need be accurate to be sincere and influential, if not determinant, as Moscow contemplates its nuclear options.

- Finally, official US and NATO assessments of nuclear risk may be distorted by "motivational bias," which understates risk in light of desired gains. In the present contingency, ongoing brinkmanship - "staying the course" - could possibly result in the enfeeblement of Russia. And this would constitute a world historic victory in what recent US national security and defense strategies frame as America's global strategic "big power" competition with Russia.⁴

Crisis Instability: The Certain Danger

In general, the likelihood of nuclear use hinges on the seriousness and immediacy of the threat that the prospective user aims to deter. Perceived existential threats are especially provocative. And possession of a large nuclear arsenal (with the vast majority of weapons held in reserve) can lead potential users to calculate that retaliation for a limited strike would be similarly limited - and soon followed by cease-fire efforts. In other words, *nuclear-weapon superpowers feeling an urgency to act might be inclined to believe that intra-war deterrence would work to their advantage.*

As the Russia-Ukraine conflict stands today, however, the probability of Moscow ordering a nuclear strike, as such, *on Ukraine* remains low - even should the Russian army continue to suffer setbacks on Ukrainian soil. For a time, Moscow will continue to have the option of significant counter-value attacks using conventional means. However, *the inhibitions on nuclear use mostly apply to intentional use of nuclear weapons on Ukrainian soil. There are effective nuclear options that need not involve attacking Ukraine or incurring casualties*, for instance: a demonstration blast in remote areas of Russia. Such an action would be intended to undo the NATO consensus for war. However, it would also involve and/or provoke abruptly heightened levels of strategic force readiness on both sides of today's strategic divide, and this would be uniquely dangerous.

Realistically, *it's crisis instability that poses the most likely danger of nuclear cataclysm.* Any situation that prompts a bi- or multi-lateral resort to peak levels of nuclear readiness - a hair-trigger standoff - greatly increases the likelihood of accidental or mistaken nuclear use.⁵

A Russia-NATO Proxy War?

The view that the Ukraine conflict had become a proxy war has shaped Russia's thinking and talk about nuclear use almost from the beginning of the conflict.⁶ Although there is no consensus that the conflict fits one or another definitions of "proxy war," Kyiv's surprising success depends on the exceptional support it has received from the United States, non-US NATO countries, and non-NATO EU countries.⁷ Furthermore, some of Ukraine's patrons bring to the war their own broader contentious relationships with Moscow as well as objectives that exceed those of Kyiv, such as the decisive weakening of Russia and hopes for regime change. *What is key to Moscow's behavior is the perception that third party involvement has fundamentally altered the goals, stakes, and dynamics of the conflict*, rendering it a strategic showdown between Russia and US-NATO with global implications.

Also relevant to Russian thinking, the war is embedded in decades-long Russia-West contention over Ukraine's development and orientation. The war itself began in 2014, not early 2022, and it flowed directly from the deposition of Russia-friendly President Yanukovich by the Maidan revolution, which had been ostentatiously supported by the United States. Of course, Moscow also has had its hands in Ukraine's internal affairs for decades. But this hardly subtracts from the view of Ukraine as a long-standing site of east-west contention. So, it should not be hard to appreciate why Moscow might see itself virtually at war with US-NATO in Ukraine now. From here, there are only a few steps to activation of Russian nuclear threats, which are our principal concern:

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- First, in Moscow's view, the war centrally involves a critical Russian security concern: the eastward expansion of NATO, an adversarial military alliance. Indeed, the prospect that NATO will soon roll up to a long Russian border represents the apogee of concern about expansion.
- Second, NATO's conventional military power and potential greatly exceeds Russia's; Nuclear weapons alone serve as levelers. Although Ukraine has no indigenous capability remotely comparable to NATO's, the alliance has acted to greatly bolster Ukrainian forces.
- Finally, Washington has made clear that America's objective in the conflict goes beyond the restoration of the *status quo ante bellum*, raising concerns about challenges to the integrity of the state.⁸

What has been clear throughout the first year of the war is that Moscow's threats of nuclear use and/or world war were meant to dissuade direct US-NATO intervention and limit Western material support for the Ukrainian war effort. However, the fact that nuclear threats have so far had a dissuasive function targeting US-NATO while Russia has relied on conventional weapons to attack Ukraine does not mean that careful management of US-NATO involvement will preclude nuclear use. Nuclear weapons are in the picture only because Moscow anticipates a critical (if not existential) challenge in the future - "check" if not "checkmate" - by Ukrainian forces already substantially enabled by US-NATO. And this will substantially alter Moscow's status regionally, among the other post-Soviet republics, and worldwide.

Can We Discount Moscow's Nuclear Threats?

Various reasons to discount the possibility of Russian nuclear use have been advanced, although none are (or should be) truly reassuring.⁹ To review them:

- First, Moscow's doctrine on nuclear use specifies that nuclear weapons will be employed against conventional threats only if the latter put at risk the survival of the Russian state. However, Russian leaders (and Russian nuclear doctrine) have also said that nuclear weapons might be used to blunt imminent threats to the "territorial integrity" of Russia. *What then is the threshold for considering a threat to the State to be existential?* Clearly something less than a march on Moscow in progress. Speculation about Putin's political survival in the aftermath of a costly catastrophic failure - and about Russia's political stability generally - may pertain to this question. At any rate, it is already known that the prospect of nuclear use is under discussion within the Russian military.

Moscow has drawn various so-called "red lines" during the course of the war, and several of these have already been crossed - for instance, cross-border attacks on Russia and attacks on strategic assets (nuclear-capable bombers). So is talk of "red lines" merely bluff? It would be unwise to think so. "Red lines" are not "trip wires" but boundary markers (in US practice as well as Russian). They delineate danger zones, like a sign marking a minefield. How many steps earn a decisive response is unclear. State leaders fail to recognize this at the peril of us all.

- Second, Moscow is supposedly unwilling to risk a negative reaction from those nations and regions that have so far refused to condemn and/or sanction it - notably China, India, Turkey, and much of the Global South. But there's no reason to believe that all degrees, forms, and circumstances of nuclear use would earn daunting levels of disapprobation from Russia-friendly governments. This is especially true if Russia otherwise faces profound and humiliating defeat, and if it offers "good terms" for a cease-fire that are refused.

Also figuring into the response calculus of non-aligned nations would be the fact that many value Russian power as a counterbalance to US power; They do not want to see it decimated. Thus, it should not be surprising that sentiment in the Global South strongly favors a diplomatic resolution of the crisis. Polls in Mexico, Egypt, Saudi Arabia, India, Indonesia, Thailand, Kenya, Nigeria, and South Africa [show public opinion to be supportive of compromise](#). Related to this, Russia's international influence is based partly on the belief that it cannot and will not be cowed. In other words, simply accepting a humiliating defeat would also impose substantial reputational costs. And it would as well diminish what ever extended deterrence power derives from Russia's nuclear arsenal - the nation's surest claim to superpower status. As analyst [Stephen Schwartz points out](#): "nuclear deterrence isn't just about possessing nuclear weapons but also being perceived by one's adversaries as being both ready and willing to use them under extreme circumstances."

- Third, Moscow will be confidently deterred from using nuclear weapons by fear of US retaliation and the risk of escalation to a general Russia-NATO war. This proposition holds that Moscow will realize that no matter how bad the impending outcome of the current conflict may seem, the resort to nuclear weapons in any way or degree will only and surely make matters worse for Russia. But the truth of this proposition is far from self-evident. Indeed, it departs from basic tenets of nuclear strategy and extended deterrence as extolled by both Russian and US military leaders and thinkers. (Of course, beliefs about extended deterrence and escalation control need not be sensible in order to be generally influential; Here the issue is what Russian strategic leaders believe.) Of course, the prospect of retaliation and escalation is a sobering concern regardless - but it cuts both ways: Would the USA be willing to risk Washington in a larger war in order to shield Bakhmut? At any rate, Moscow may seek options for nuclear use that it feels fall below the threshold for sparking general war between NATO and Russia.
- A fourth argument is that nuclear weapons would not be sufficiently effective on Ukrainian battlefields unless used in quantities that would also put Russian troops at risk, cause very substantial civilian casualties, and have lasting radiological effects on Russian occupied areas.¹⁰ These are true limitations that pertain generally to the use of tactical nuclear weapons. Nonetheless, both Russia and the United States maintain stockpiles of these munitions as well as operational concepts to guide their use. Whether held for warfighting or deterrence, *no one who stockpiles these weapons sufficiently believes that all who possess them are convinced of their non-utility.*¹¹ At any rate, the drawbacks mentioned here don't address the most likely ways that Russia could put nuclear weapons to use.

Moscow can try to achieve a strategic effect through the use of nuclear weapons in ways that incur minimal, if any casualties or collateral damage. A warning blast would suffice - as suggested by Anya

Fink, a research scientist at the Center for Naval Analysis.¹² This might involve a single tactical weapon in a deserted area or an underground test of a larger weapon (perhaps at the old Novaya Zemlya test site in the Arctic Ocean). Ulrich Kühn of the Carnegie Endowment for International Peace sketched a similar scenario in 2018 involving a no-casualty demonstration blast over the North Sea meant to deter NATO action with regard to a hypothetical Baltic conflict.¹³ In any such case, the point would be to signal that the prospect of a qualitative leap in the character of the war was at hand.

Although demonstration blasts are consonant with Russian doctrine and thinking,¹⁴ this prospective use of nuclear weapons to influence the Russia-Ukraine conflict is also discounted by some:

“A showcase detonation of a nuclear warhead...will not scare off Kyiv. What it will do is destroy any remnants of Russia’s reputation as a signatory of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and deprive Moscow of Turkey, India, and China’s amicable neutrality.”¹⁵

It may be true that, on balance, *leadership in Kyiv* will not be daunted by a distant demonstration blast. But Ukrainian leaders are also painfully aware that their nation’s present and future are heavily dependent on the USA, NATO, and the EU. A likely and achievable aim of Moscow’s atomic demonstration would be to collapse the European NATO consensus for war and impel a process of negotiation. And it is questionable that Moscow would worry more about its loss of reputation as a member of the CTBT than about the ongoing decimation of its military power, the sure advance of NATO to its borders, and its loss of reputation as a great power. (Notably, the CTBT is not yet in force, awaiting ratification by the USA, China, India, Pakistan, Iran, and Israel. Also, multiple arms control agreements have been tossed aside during the past two decades. And North Korea has conducted six nuclear tests between 2006 and 2017 resulting in an array of sanctions comparable in some respects to those *already* imposed on Russia.)¹⁶

Moscow might alternatively collapse the NATO consensus for staying the course by using a half-dozen tactical nuclear weapons on the battlefield (with more held in ready reserve.) In this case, it would not be the limited tactical effect that would matter; Instead, what would register is the strategic shock accompanying any use of nuclear weapons. But this alternative would come at much higher cost and risk for Moscow; By contrast, a demonstration blast would *seem to signal a modicum of restraint*.

Not all observers who discount Putin's threats necessarily believe that the probability of Russian nuclear use is near zero, however. Some - a “fear itself” cohort - seem principally focused on how the fear of possible nuclear outcomes may unnecessarily handicap very desirable military support and action.¹⁷ This attests to the fact that other considerations can weigh into thinking about tradeoffs. These other factors include the expected degree of damage should use occur, response options, the prospects of escalation control, and the expected payoff for holding firm. One enduring strain of strategic thought East and West contends that nuclear conflicts can be meaningful won and that escalation can be controlled and limited.¹⁸ Putative payoffs for holding firm in Ukraine could include the recovery of all stolen territory, the discouragement of future instances of nuclear threat, and even the decimation of Russian power. Each of these would be weighed against prospective risks and costs.

One prospective causal chain leading to nuclear use begins with NATO-empowered Ukrainian forces resuming their successful advance:

As the ASU/ZSU approaches the Russian border, increasingly strikes Russian territory with missiles and drones, and challenges Russian possession of Crimea, it is very likely that Moscow will perceive a critical challenge to its national security, political stability, and status as a world power. Unless US-NATO leaders decide to advance negotiations at this juncture (or before), Moscow may signal dramatic escalation. This is especially true if its battlefield forces seem to be in disarray.

Russian escalation could involve putting their strategic forces on high alert and possibly beginning to deploy some tactical nuclear units in an ostentatious fashion.¹⁹ This would prompt a sense of nuclear emergency or crisis. A dramatic additional step might be a nuclear warning blast over or under Russian territory. With or without this dramatic additional step, Washington will similarly raise the alert level of nuclear and conventional forces. These developments would represent a crisis more severe than the 1962 Cuban missile standoff; This, because a nuclear standoff today would occur in the context of a very deadly ongoing war occurring directly on the border of a nuclear weapon superpower.

A more destructive intentional use of a tactical nuclear weapon or weapons - involving mass casualties and material damage - is also possible. The drawbacks summarized earlier (in section on discounting nuclear threats) weigh against this type of attack (ie. intentional fatal use), but cannot preclude it. Also possible is mistaken, accidental, or rogue use of nuclear weapons. Experience (and common sense) suggest that this last category of use is more likely when tensions are greatly elevated.²⁰

How to weigh these various dangers of nuclear use? Consistent with our review of current dynamics, past practice, and doctrine, we conclude that,

- It is likely that in response to a comprehensive Ukrainian breakthrough Moscow will move its strategic forces to "threat of war" alert level and begin to deploy elements of battlefield nuclear units.
- Regarding the additional or complimentary step of a nuclear warning blast in Russian territory: It is fair to say that it is unlikely, but it would be unwise to bet high odds against this eventuality in the context of a collapsing Russian effort.
- The use of even a limited number of tactical nuclear weapons near or against the leading edge of Ukrainian units would remain very unlikely in any context. Still, it would be irresponsible to simply ignore this possibility. Protection of Ukrainian units against radiological effects is essential and should begin immediately.
- Regarding mistaken, accidental, or rogue use of nuclear weapons under hair-trigger conditions in the course of high-intensity conventional war: Although no analytically rigorous calculation of probability is possible, it is judicious to *postulate* (or assume) a likelihood of unintentional or rogue use; This, in order to guide policy and defensive preparations. A probability in the range of 1/30 is (i) not implausible in light of past experience in hair-trigger nuclear standoffs [see ft. 20] and (ii) minimally restrained in light of downside risk. This is not meant as a hard and fast estimate, but rather an injunction to "act as if" in light of downside risk.

- The probability of escalation to a direct Russia-NATO conflict will remain low, although the eventuality cannot be reliably excluded given current war objectives on all sides and the trajectory of Russia-US threats and counter-threats. Russian nuclear use in Ukraine, either intentional or unintentional, may invite direct US intervention; Washington has pledged as much. And a US-NATO attack of any sort on Russia or Russian forces would substantially increase the likelihood of a nuclear response.

The experience of the Cuban Missile Crisis remains relevant to wisely managing the current confrontation. Reflecting on the crisis 26 years after the fact, US President Kennedy's national security advisor McGeorge Bundy estimated that the standoff had involved a 1/100 risk of nuclear war; Kennedy had thought the chances of general war were much higher - between 1/3 and 1/2.²¹ The gap between these two would seem irresolvable, but Bundy finessed it by taking consequences into account, writing that "In this apocalyptic matter the risk can be very small indeed and still much too large for comfort."

Although the probability of a big power nuclear clash of any magnitude over Ukraine remains low, it would be irrational and irresponsible to act as though we can roll the nuclear dice and never come up "snake eyes."²² Foremost in today's policy planning should be Bundy's observation that even a very limited nuclear exchange "would be a disaster beyond history."²³

ENDNOTES

1. < Anna Clara Arndt and Dr Liviu Horovitz, [Nuclear rhetoric and escalation management in Russia's war against Ukraine: A Chronology](#) (Berlin: German Institute for International and Security Affairs, 03 Sep 2022); ["Putin loyalist dials up nuclear rhetoric as NATO partners push for more weapons for Ukraine,"](#) *CNN*, 19 Jan 2023; ["Russian State Duma Head Joins Officials Warning Of Nuclear Retaliation In Ukraine,"](#) *RFE/RL*, 22 Jan 2023.

2. < Gustav Gressel, ["Signal and noise: What Russia's nuclear threat means for Europe,"](#) European Council on Foreign Relations, 2 Mar 2022.

3. < Moscow's perception of NATO as threatening should not be surprising much less incomprehensible. NATO was created in opposition to Moscow and served as the military counter-balance to the Soviet alliance for 40+ years. NATO expansion was both an instance and cause of the shared failure to integrate Russia with the post-Cold War European order. Regarding the structural character of NATO, as analyst Edward Luttwak has pointed out:

"NATO is not a security-talking shop but a veritable military force, complete with a hierarchy of operational war headquarters, intelligence and planning staffs, a joint surveillance force of AWACS aircraft, an air defense network with radar from Norway to Turkey and elaborate logistic facilities... In other words, NATO is a fighting force, temporarily at peace." Edward N. Luttwak, oped, ["A Look at Expanding NATO,"](#) *Washington Post*, 06 Jul 1997.

Since the end of the Cold War, NATO or its leading members have conducted multiple regime-change efforts using both non-military and military, covert and open means. For Russia (or any nation), the close proximity of a powerful strategic competitor would constitute a potential "threat in being." At minimum, close proximity would give the alliance greater leverage over Moscow. To compensate for NATO's eventual spread to Ukraine, Russia would have to substantially increase surveillance and defenses along a ~2300-km border. It would still be vulnerable to increased cross-border surveillance, espionage, and covert action. And, of course, there's no easy way to compensate for the loss of 1,000-km of defensive depth.

Recognizing these realities in no way justifies Moscow's recent actions or its behavior in general. Recognition only serves to illuminate the predictable paths of Russian policy.

4.◁ [National Security Strategy of the United States](#) (Washington DC: The White House, Oct 2022).

5.◁ Such was the case during the Cuban crisis when the commander of submarine C-19 had to be dissuaded from firing a nuclear torpedo when possibly under attack. (Out of touch with Moscow and being signaled to surface by US depth charges, the captain reportedly believed that nuclear war might have already commenced. Luckily, the fleet commander was on-board to weigh against that option.)⁶ And this was only one of three nuclear "close calls" during the crisis (as reviewed below). National Security Archive, [The Underwater Cuban Missile Crisis at 60](#), George Washington University, accessed 01 Jan 2023.

6.◁ "Is the US now officially engaged in a proxy war with Russia in Ukraine? It depends who you ask; Part of problem is lack of agreed definition," Independent, 09 May 2022. Also: Lt Colonel Amos C. Fox, [Ukraine and Proxy War: Improving Ontological Shortcomings in Military Thinking](#), Association of the United States Army, 16 Aug 2022.

7.◁ For example, leading up to Russia's retreat across the Dnieper, its standing on the west bank had been deteriorating for weeks. Why? "The arrival of Western weapons - US-made HIMARS artillery systems and M777 howitzers, French-made Caesar howitzers, German-made Panzerhaubitze self-propelled artillery, among others - gave Ukraine the ability to hit Russian targets further behind the front lines from a safer distance." "[Bad News Politically, Shrewd Move Militarily? What Russia's Kherson Retreat Means - And What It Doesn't](#)," RFE/RL, 10 Nov 2022.

Representative of arms transfers through mid-December, Ukraine had received more than 500 tanks, more than 90 multiple launch rocket systems (of which 20 are HIMARS and 10 are the tracked M270 MLRS), approximately 900 howitzers (of which about 400 are self-propelled), and ~60,000 anti-armor systems.

- ["Arms Transfers to Ukraine,"](#) Forum on the Arms Trade, Jan 2023.
- ["List of foreign aid to Ukraine during the Russo-Ukrainian War,"](#) Wikipedia, Jan 2023.
- ["US, NATO countries announce massive weapons package for Ukraine,"](#) NPR, 20 Jan 2023.
- ["Putin Has A Problem: NATO Is Sending Artillery and Tanks to Ukraine,"](#) 1945, 16 April 2022.

More recently, the USA, Germany, the UK, Poland, and Canada haven agreed to send modern main battle tanks: M1A2 Abrams, Leopard II, and Challenger. Additionally, the USA will be sending Bradley Infantry Fighting Vehicles (IFV), Germany will send the Marder IFV, and France will dispatch the AMX-10RC.¹¹¹ (The AMX-10RC is a more lightly armored wheeled vehicle but it brings a 105-mm gun to the fight - a tank-killer.)

- ["Factbox: Tanks for Ukraine: who is lining up to send them?"](#) Reuters, 25 Jan 2023.
- ["The Ukrainian Army Could Form Three New Heavy Brigades With All These Tanks And Fighting Vehicles It's Getting,"](#) Forbes, 17 Jan 2023.
- ["Ukraine Gets 'Tank Killers',"](#) New York Times, 06 Jan 2023.

8.◁ ["The US has a big new goal in Ukraine: Weaken Russia,"](#) Washington Post, 26 Apr 2022. Also: ["US war aims shift in Ukraine — and bring additional risks,"](#) NPR, 27 Apr 2022.

9.◁ **Viewpoint: Russia Will Not Use Nuclear Weapons**

- George Mitrovich, ["Why Hasn't Putin Gone Nuclear in Ukraine?"](#) *The National Interest*, 17 Nov 2022.
- ["Russia's Nuclear Weapons Rhetoric. US officials say they do not believe that Russia has decided to detonate a tactical device, but concerns are rising,"](#) NYT, 2 Nov 2022.
- ["Nuclear war in Ukraine not likely,"](#) *The Well*, 27 Oct 2022.
- ["Putin 'Very Unlikely' to Use Nuclear Weapons: Retired US General,"](#) *Newsweek*, 26 Oct 2022.
- ["Russia's nuclear arsenal is huge, but will Putin use it?"](#) NPR, 17 Oct 2022.

- [“Will Putin Use Nuclear Weapons in Ukraine? Local Experts Explain,”](#) *NBC Boston*, 12 Oct 2022.
- [“Interview with Paul Bracken: Could Russia Really Go Nuclear?”](#) *Yale Insights*, 11 Oct 2022.
- William Alberque, [“Russia is unlikely to use nuclear weapons in Ukraine,”](#) *IISS Analysis*, 10 Oct 2022.
- [“In Ukraine Conflict, Nuclear Escalation Is Possible, But Not Likely, Expert Says,”](#) *Texas A&M Today*, 13 April 2022.
- Olga Oliker, [“Putin's Nuclear Bluff,”](#) *Foreign Affairs*, 11 Mar 2022.
- J. Andrés Gannon, [“If Russia Goes Nuclear: Three Scenarios for the Ukraine War,”](#) Council on Foreign Relations, 9 Nov 2022.
- *The War Zone*, [“Nuclear Experts On Chances Of Russia Using Atomic Weapons In Ukraine,”](#) 30 Sep 2022.

10. < Hans M. Kristensen & Matt Korda, [“Tactical nuclear weapons,”](#) *Bulletin of the Atomic Scientists*, 30 Aug 2019.

11. < Amy F. Woolf, [Nonstrategic Nuclear Weapons](#), US Congressional Research Service, Washington DC, 07 March 2022. Also: William A. Chambers, John K. Warden, Caroline R. Milne, and James A. Blackwell, [An Assessment of the U.S.-Russia Nonstrategic Nuclear Weapons Balance](#), Institute for Defense Analysis, Jan 2021.

12. < [“Russia's nuclear arsenal is huge, but will Putin use it?”](#) *NPR*, 17 Oct 2022.

13. < Ulrich Kühn, [Preventing Escalation in the Baltics: A NATO Playbook](#) (Washington DC: Carnegie Endowment for International Peace, 28 March 2018).

14. < Kofman and Fink, [“Escalation Management and Nuclear Employment in Russian Military Strategy,”](#) *War on the Rocks*, 19 Sep 2022. Also: Kofman, Fink, Edmonds, [Russian Strategy for Escalation Management: Evolution of Key Concepts](#) (Arlington Virginia: CNA, Apr 2020).

15. < [“Strategic Procrastination: What’s Russia’s Game With Nuclear Signaling?”](#) *Carnegie Politika*, 10 Nov 2022.

16. < [“Comprehensive Nuclear Test Ban Treaty \(CTBT\),”](#) *Nuclear Threat Initiative*, accessed 18 Dec 2022.

17. < Anne Applebaum, [“Fear of Nuclear War Has Warped the West’s Ukraine Strategy,”](#) *The Atlantic*, (07 Nov 2022). Also:

- Daniel Bilak, [“The West must urgently overcome its fear of provoking Putin,”](#) *Atlantic Council* blog, 25 Nov 2022.
- Dan Reiter, [“Don’t Panic About Putin,”](#) *Foreign Affairs* (7 Nov 2022)

18. < John K. Warden, [Limited Nuclear War: The 21st Century Challenge for the United States](#), Livermore Papers on Global Security No. 4, Lawrence Livermore National Laboratory, Center for Global Security Research, July 2018.

19. < To indicate a higher state of Russian strategic force readiness “land- and rail-based mobile missile systems can be dispersed, missile-armed submarines in port can be sent out to sea, and bombers can be loaded with nuclear weapons. Measures to enhance the stability of command and control systems may include the activation of reserve command centers and reserve communication channels and the deployment of mobile relay stations for the transmission of commands to submarines and bombers.” Of course, half-steps along these paths would also be obvious and would understandable stir great concern. Pavel Podvig ed, [Russian Strategic Nuclear Forces](#) (Cambridge MA: MIT Press, 01 Nov 2001); Chapter 2, “The Structure and Operations of Strategic Nuclear Forces Russian Strategic Nuclear Forces”.

20. < There have been dozens of nuclear weapon-related accidents since the 1945 as well as a handful of publicly-known incidents of mistaken near-use due to faulty perception of attack. A high percentage of these false

warnings occurred during conflict crises - in 1956 during the Suez Crisis, 1973 during the Arab-Israeli October War, and most critically during the Cuban Missile Crisis when a Soviet submarine nearly launched a nuclear torpedo, US radar operators separately mistakenly reported to the US air defense command that a missile attack was underway, and a US F-102 fighter armed only with nuclear air-to-air missiles rushed to protect a U-2 that had wandered into Soviet air space. It should not be surprising that mistaken perceptions or rash action cluster around crisis periods.

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- ["Broken Arrows: Nuclear Weapons Accidents,"](#) Atomic Archive, accessed, 30 Dec 2022.

[21.](#)◁ McGeorge Bundy, [*Danger and Survival: Choices About the Bomb in the First Fifty Years*](#) (New York: Random House, 1988); Graham Allison, ["The Cuban Missile Crisis at 60: Six Timeless Lessons for Arms Control,"](#) *Arms Control Today*, October 2022.

[22.](#)◁ A roll of two dice in which both turn up only one pip is "snake eyes" - a losing roll. Its probability of occurrence is 1/36.

[23.](#)◁ McGeorge Bundy, ["To Cap the Volcano,"](#) *Foreign Affairs* 48, no. 1 (October 1969).