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REPORT

# Racing Towards Risk: The Hidden Costs of Nuclear Arms Build-Up

TIM CAUGHLEY

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# Abbreviations

| | |
|---|---|
| **ICBM** | intercontinental ballistic missile |
| **NATO** | North Atlantic Treaty Organization |
| **New START** | Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms |
| **NPT** | Treaty on the Non-Proliferation of Nuclear Weapons |
| **SLBM** | submarine-launched ballistic missile |
| **TPNW** | Treaty on the Prohibition of Nuclear Weapons |
| **WMD** | weapons of mass destruction |


# Executive Summary



Lessons drawn from the Cold War between the Soviet Union and the United States are pertinent in today's world given current speculation about nuclear arms races. The prospect that the stockpiles of the Russian Federation and the United States—which contracted considerably after the height of that conflict—might increase once again is disturbing. So, too, is the growth in China's nuclear arsenal.

On current evidence, nuclear arms races have not led inexorably to nuclear war. But they carry with them a range of other risks. The risk of peace is not one of them: rather arms races sustain, or intensify, the levels of enmity among protagonists. They may lead (after enormous expenditure) to an acceptance of the need for arms control, but that outcome alone does not make those risks worth running—risks that are already inherent in the very existence of nuclear weapons, let alone in the deliberate, competitive proliferation of them together with the likely exacerbation of existing tensions.

This paper outlines the key risks of nuclear arms racing among China, the Russian Federation, and the United States, including the possibility of nuclear war and its consequences, as well as the potential impact on the Nuclear Non-Proliferation Treaty and other related consequences. The impulse towards further nuclear weapon proliferation in preference to dialogue, at a time when the major powers involved are scarcely in conversation with one another and arms control is barely on the table, is devoid of responsibility let alone rationality. Following an examination of the risks of a nuclear arms race at stake, this paper suggests ways in which those risks might be managed.

# Introduction

© Reagan and Gorbachev during their First Summit Meeting in Geneva, 1985, Collection: White House Photographic Collection.

A tense international security environment, like today's, is a breeding ground for increased expenditure on arms and a competitive build-up of arsenals by antagonistic States. In the Cold War, those conditions continued for 45 years in a nuclear arms race of relentless accumulation. No direct military campaigns between the two adversaries came to pass although there were highly dangerous moments and numerous proxy wars.

At the Soviet–United States Summit Meeting between Presidents Reagan and Gorbachev on 10 December 1987 that effectively marked the end of the Cold War, the two leaders expressed their conviction that "a nuclear war cannot be won and must never be fought".[1] They had just signed the Intermediate-Range Nuclear Forces Treaty (INF), which eliminated an entire class of US and Soviet nuclear arms with verification provisions for its enforceability.[2]

The two leaders also agreed, in the interests of strategic balance, not to seek military superiority. That was then, when the nuclear arsenals of the Soviet Union and United States were unparalleled. Now the United States intelligence community is suggesting that China will try to rival the Russian Federation and the United States in the next decade[3] – something strenuously denied by China.[4] Measuring military

1 Joint Statement on the Soviet–United States Summit Meeting, 10 December 1987, https://www.reaganlibrary.gov/archives/speech/joint-statement-soviet-united-states-summit-meeting

2 Ibid.

3 U.S. Department of Defense, "Military and Security Developments Involving the People's Republic of China 2024" (2024), https://media.defense.gov/2024/Dec/18/2003615520/-1/-1/0/MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA-2024.PDF

4 Ken Moritsugu, "China Denies US Report it's Rapidly Growing its Nuclear Arms", AP, 4 January 2022, https://apnews.com/article/china-beijing-7b1cc3db0e3ea4136dc8030e177dfa7d

superiority between two States is not a precise science, let alone among three. In the event that China's objective is to achieve strategic parity with the Russian Federation and the United States—or even if it is not—the response of the latter two will determine whether a new arms race arises.

While settling for parity contributed to the ability of the Soviet Union and the United States to end a two-way arms race and agree to certain arms limitations, the emergence of a tripartite race would be more complicated. For instance, the United States might be willing to settle for parity with a number exceeding New Start limits if not an aggregation of Chinese and Russian nuclear arsenals, but China and the Russian Federation might each insist that their respective arsenals approximate that of the United States.[5]

The Cold War arms race first slowed with the advent of the Strategic Arms Limitation Talks (SALT) in 1972 once Washington and Moscow had recognized that piling more nuclear arms into one's arsenal did not increase security if the other side was doing the same. And, after a spurt by the Soviet Union in 1980, the conflict ultimately ground to a conclusion with mutual recognition that a nuclear war in its inevitable devastation could have no winners. The risk of nuclear war during the Cold War arms race was ultimately contained, but it has been observed in the case of India and Pakistan that the most dangerous time of a competitive build-up of nuclear arms is in the early stages.[6] The Cuban missile crisis proved salutary in this regard, after which Soviet and American leaders initiated steps to reduce nuclear dangers by more intensive crisis management practices including improved direct communications.[7] The Twin Peaks conflict over Kashmir shortly after India and Pakistan had developed nuclear weapons highlighted the need for those two States to do likewise.[8]

The focus of this paper is on the nuclear arsenals of China, the Russian Federation and the United States. It does not attempt to measure the current state of the nuclear arsenals of the five other nuclear armed States (the Democratic People's Republic of Korea, France, India, Pakistan, and United Kingdom) or of Israel, which does not publicly acknowledge its possession of nuclear arms. Nor does the paper discuss nuclear groupings such as NATO, or the size of arsenals of *conventional* weapons of any State.

5 Charles L. Glaser, James M. Acton, and Steve Fetter, "The U.S. Nuclear Arsenal Can Deter Both China and Russia: Why America Doesn't Need More Missiles", Foreign Affairs, 5 October 2023, https://www.foreignaffairs.com/united-States/us-nuclear-arsenal-can-deter-both-china-and-russia

6 Michael Krepon, "Prospects for Nuclear Risk Reduction in Southern Asia", Strategic Analysis 33, no. 3 (June 2009), 426–432, https://doi.org/10.1080/09700160902790118

7 Polly Nayak and Michael Krepon, "US Crisis Management in South Asia's Twin Peaks Crisis", Stimson Center, 1 September 2006, p. 12, https://www.jstor.org/stable/resrep11005.5

8 Krepon, "Prospects for Nuclear Risk Reduction in Southern Asia", 426–432.


# I. What is an Arms Race?



Arms races—the quest to build-up military capability between two or more rival States—are commonplace in history. Whether arms races, involving nuclear or conventional weapon capacity or both, contribute to the outbreak of war has long been the subject of debate. While the Cold War between the United States and the Soviet Union did not develop into direct open warfare between them, it soon involved a demonstrably intensive *nuclear* arms race. The Soviet Union tested its first atomic weapon in 1949, four years after the initial United States test. The ensuing development of their respective nuclear arsenals peaked at 31,000 weapons in 1967 (United States) and an estimated 40,000 in 1986 (Soviet Union).[9]

Bilateral arms control agreements between the United States and the Soviet Union (later the Russian Federation), as well as unilateral initiatives of the two States during the period from 1987 to 2011, saw the number of deployed and non-deployed nuclear weapons decline substantially.[10] The New START agreement of 2010[11] limited both parties to 1,550 'accountable' strategic nuclear warheads on deployed delivery systems.[12] The Russian Federation announced in February 2023 that it had suspended that treaty. The United States then introduced countermeasures effectively amounting to suspension, but both States pledged to adhere to New START limits.

9 Hans M. Kristensen and Robert S. Norris, "Global Nuclear Weapons Inventories, 1945–2013", Bulletin of the Atomic Scientists 69, no. 5 (2013), https://doi.org/10.1177/0096340213501363

10 The INF Treaty eliminated stocks of medium-range, nuclear-capable, land-based missiles.

11 Treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms, https://2009-2017.state.gov/documents/organization/140035.pdf

12 New START also limits the number of deployed and non-deployed ICBM launchers, SLBM launchers, and heavy bombers equipped for nuclear armaments to 800. The number of deployed ICBMs, SLBMs, and heavy bombers equipped for nuclear armaments is limited to 700. The Treaty allows for satellite and remote monitoring, as well as 18 on-site inspections per year to verify limits.

Since the Russian Federation's annexation of Crimea in 2014, the levels of mutual enmity and distrust that marked the Cold War have returned, and with it the possible advent of another nuclear arms race between the United States and the Russian Federation. The timing is doubly worrying. First, unless New START is replaced by a new agreement, there will be no bilateral nuclear arms reductions treaties in place between the Russian Federation and the United States and thus no legal limits on the strategic forces of either country. Second, there is a third major player in the potential race — China (currently with some 500 nuclear weapons). Third, there is the possibility of knock-on impacts on the arsenals of the United Kingdom and France in respect of the Russian Federation and of India and by extension Pakistan in respect of China.

In the absence of a common definition, a *nuclear* arms race refers to (and is understood in this paper to be) the competitive build-up of nuclear arms among antagonistic States, as well their nuclear forces (nuclear warheads and the means and skills needed to deploy them via missiles, submarines, aircraft, and so on). In arms races, the competitors are generally adversaries, often hostile antagonists.[13] Arms races are not, of course, specific time-bound events but open-ended, with escalating behaviour aiming for military supremacy or strategic balance.[14] There are no prizes except where ascendancy (or a perception thereof) provides a degree of comfort that enemies will either be deterred from attacking or defeated if they do.

*"A nuclear arms race is understood in this paper to be the competitive build-up of nuclear arms among antagonists States—as well their nuclear forces."*

Defining an 'arms race' is perhaps a less complicated task than determining the actual existence of one. This is not simply a matter of quantifying the respective numbers of nuclear warheads (vertical proliferation). It also entails a qualitative analysis of, among other things, the sophistication of targeting, system accuracy, and related intelligence—factors that can be inherently difficult to assess (horizontal proliferation).[15] Military industrial complexes are secretive, the precise use of funds budgeted for nuclear weapons and delivery systems is often opaque, and the structure of nuclear forces and doctrines governing their actual use differ from State to State.

13 Britannica, "Arms Race", https://www.britannica.com/topic/arms-race

14 Hal Brands, "The Art of the Arms Race", Foreign Policy, 1 July 2022, https://foreignpolicy.com/2022/07/01/arms-control-race-cold-war-geopolitical-rivalry

15 Ibid.

There are other considerations about determining the parameters of a nuclear arms race or its very existence. There is the question (not discussed here) of whether day-to-day maintenance and modernization[16] of nuclear arsenals amounts to arms racing or is simply the pragmatic upgrading of safety systems and incorporation of updated technology.[17]
In the absence of arms control commitments,[18] States are not required to declare the size of their nuclear arsenals, but they may voluntarily do so, for example, to seek kudos for reductions that have been made.[19]

Or they may hint at increases if they believe that this might strengthen the aura of deterrence with which nuclear arsenals are shrouded.[20]Nuclear deterrence doctrine, broadly stated, is rooted in the belief that these weapons serve as a type of assurance against certain forms of aggression and underwrite broader security stability. Developed during the Cold War, this rationale centred on the magnitude of consequences of nuclear weapons use, with "a kind of threat which ... must be *absolutely* effective" because just one use would "be fatally too many".[21]

16 Chapter 6 of the SIPRI Yearbook 2024 reports that the nine nuclear-armed States — China, the Democratic People's Republic of Korea, France, India, Israel, Pakistan, the Russian Federation, the United States, and the United Kingdom — continued to modernize their nuclear arsenals: https://www.sipriyearbook.org/

17 Maintenance of nuclear arms by all nine nuclear-armed States is presumably ongoing; judging whether those activities are in the spirit of nuclear disarmament is beyond the scope of this paper.

18 See A.G. Arbatov's point about nuclear arms control and deterrence: that the latter "can be a guarantee of peace only when combined with the maintenance and expansion of the nuclear arms control system and regimes"; A.G. Arbatov, "Doomsday Dialectics: the Arms Race with Arms Limitations", Polis, no. 3 (2019), https://www.politstudies.ru/en/article/5518

19 France Diplomacy, "Nuclear disarmament", 26 August 2025, https://www.diplomatie.gouv.fr/en/french-foreign-policy/security-disarmament-and-non-proliferation/disarmament-and-non-proliferation/treaty-on-the-non-proliferation-of-nuclear-weapons/nuclear-disarmament/

20 SIPRI, "SIPRI Yearbook 2024", https://www.sipri.org/yearbook/2024

21 Bernard Brodie, "The Anatomy of Deterrence", The RAND Corporation, 23 July 1958, https://www.rand.org/content/dam/rand/pubs/research_memoranda/2008/RM2218.pdf; see also, Thomas Schelling, Arms and Influence (Yale University Press, 1966).

# II. What are the Risks of an Arms Race?

© Nuclear Artillery Test Grable Event – Part of Operation Upshot-Knothole, 1953, US National Nuclear Security Administration.

## 1. Risk of Nuclear War

Intuitively, nuclear arms racing increases risks of weapons use, nuclear testing, accidental detonations and, ultimately, a nuclear war. Nevertheless, considering the past, none of these outcomes is a foregone conclusion—the Cold War build-up had many side-effects but averted an actual physical conflict at least between the two adversaries with its likely catastrophic humanitarian consequences.[22] That arms race played itself out to the point where each side recognized the emergence of strategic balance and/or the race's growing risks. The current global reality, however, features three and not two potential very heavily armed nuclear adversaries.[23]

*"Intuitively, nuclear arms racing increases risks of weapons use, nuclear testing, accidental detonations and, ultimately, a nuclear war."*

22 In the agreed Final Document of the 2010 NPT Review Conference (NPT/CONF.2010/50 (Vol. I)), governments officially expressed their "deep concern at the catastrophic humanitarian consequences of any use of nuclear weapons" and reaffirmed "the need for all States at all times to comply with applicable international law, including international humanitarian law".

23 Andrew F. Krepinevich Jr., "The New Nuclear Age: How China's Growing Nuclear Arsenal Threatens Deterrence", Foreign Affairs (April 2022), https://moderndeterrence.com/the-new-nuclear-age-china-threatens-deterrence/

The risk of use of nuclear weapons stemming from a nuclear arms race could theoretically occur in a number of cases:

- In escalation from a conflict being fought inconclusively with conventional weapons.
- Through the launch of a limited nuclear strike as a means both of restoring deterrence and to end a conventional war.[24]
- In provocation, where the nuclear build-up exacerbates existing tensions to a breaking point beyond recourse to the conventional weapon capabilities of the party provoked.
- In pre-emption, where one party to a potential conflict whose arsenal is already adequate fears it might soon be surpassed by that of a rival.
- By way of unplanned nuclear detonation due to accident, inadvertence, miscalculation or unforeseen technical inadequacy or flaw of design.

China, the Russian Federation and the United States (as well as the other two NPT nuclear-weapon States, France the United Kingdom) have reaffirmed that "none of our nuclear weapons are targeted at each other or at any other State" and maintain that they "intend to continue seeking bilateral and multilateral diplomatic approaches to avoid military confrontations, strengthen stability and predictability, increase mutual understanding and confidence, and prevent an arms race that would benefit none and endanger all".[25] It is an intention, too, that assumes rational leadership and an awareness that any military confrontation may degenerate into nuclear war leading to 'mutual assured destruction'.[26]

The current trust of these States in the ability of their nuclear arsenals to deter nuclear conflict rests on the avoidance of use for any reason, with the possible exception of extreme circumstances of self-defence in which the very survival of a State would be at stake[27] circumstances that would arise not from an arms race per se, but only in the direst moments of actual conflict.

Incidentally, despite the good intentions just mentioned, there is no uniform commitment to a doctrine of 'no first use' of nuclear weapons or of confining retaliation by nuclear forces only to situations of attack by weapons of mass destruction. But it is to be hoped that at the very least there is awareness of the 'taboo'[28] on nuclear weapon use in conflict that marks 80 years of non-use since Hiroshima and Nagasaki in 1945.

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24 S. Karaganov, D.V. Trenin, and S.I. Avakyants, "From Restraining to Deterring", 5 November 2024, https://karaganov.ru/en/from-restraining-to-deterring/

25 Joint Statement of the Leaders of the Five Nuclear-Weapon States, "Preventing Nuclear War and Avoiding Arms Races", 3 January 2022, https://www.diplomatie.gouv.fr/en/french-foreign-policy/security-disarmament-and-non-proliferation/news/2022/article/joint-statement-of-the-leaders-of-the-five-nuclear-weapon-states-on-preventing

26 Mutual assured destruction (MAD) is "principle of deterrence founded on the notion that a nuclear attack by one superpower would be met with an overwhelming nuclear counterattack such that both the attacker and the defender would be annihilated."; see Britannica, "Mutual Assured Destruction", https://www.britannica.com/topic/mutual-assured-destruction#ref345158

27 The ICJ in its 1996 Advisory Opinion on the Legality of Nuclear Weapons observed that "it cannot reach a definitive conclusion as to the legality or illegality of the use of nuclear weapons by a State in an extreme circumstance of self-defence, in which its very survival would be at stake", paragraph 97, https://iilj.org/wp-content/uploads/2016/08/Legality-of-the-Threat-or-Use-of-Nuclear-Weapons-1996.pdf

28 See Nina Tannenwald at "International Norms, Nuclear Taboo, and the Risk of Use of Nuclear Weapons", Vienna Centre for Disarmament and Non-Proliferation, 23 March 2023, https://vcdnp.org/international-norms-nuclear-taboo-and-the-risk-of-use-of-nuclear-weapons/

The abovementioned risk of accidents inadvertence, miscalculation or unforeseen technical inadequacy or flaw of design will be discussed separately.

Averting the risk of nuclear war—which an arms race might precipitate—will likely depend on the strategic calculations made by the three potential adversaries. For instance, as maintained by Glaser, Acton and Fetter, even if China and the Russian Federation "launched simultaneous large-scale nuclear strikes on U.S. nuclear forces, the United States would be able to use its surviving nuclear weapons to inflict massive damage on both countries; each would suffer essentially as much damage as if it had been the United States' only adversary".[29] Moreover, augmenting the size of the US nuclear arsenal "would almost certainly lead to a three-way arms race that would divert resources away from other defense needs and exacerbate tensions with China and [the Russian Federation], increasing the risk of a crisis or conflict that might turn nuclear".[30]

More explicitly, strategic calculations may weigh 'counterforce' targeting of an adversary's nuclear forces and their command and control infrastructure (a comparatively exacting pursuit) versus 'countervalue' targeting of non-military targets as well—the ability to inflict damage against an adversary's society. Under the latter approach, as long as the United States maintains, as now, a survivable nuclear force that is large enough to inflict catastrophic damage against both China and the Russian Federation, it will not need in practical terms to engage in arms racing. In other words, a countervalue approach renders the relative size of the protagonist's nuclear forces irrelevant.[31]

The downsides of countervalue targeting are nonetheless gross violation of the laws of armed conflict including international humanitarian law and might trigger nuclear attack on one's own cities. Conscious of the international law implications of such a strategy, Glaser, Acton and Fetter argue nonetheless that the "most ethical and moral policy is not a counterforce strategy but one that minimizes the probability of nuclear war, as well as the probability and extent of escalation if war occurs".[32] They also caution against overreacting to China's build-up and "generating an unnecessary and futile arms race, and increasing the probability of nuclear war".[33]

Yet the nuclear war risk equation arising from an arms race is more complex. While the United States may approach the build-up question from a political rather than a military perspective, impetus towards a nuclear arms race is likely influenced by reactions and perceptions of potential adversaries. Jerome D. Frank wrote in 1986 that: *"(t)he accumulation of nuclear weapons, beyond the level where each nuclear opponent can destroy ... the other's nuclear arsenal (a level long since exceeded by the United States and the Soviet Union), conveys only the appearance of security and power. As a result, the main function of nuclear weapons has become to demonstrate determination to prevail".*[34]

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29 Glaser, Acton and Fetter, "The U.S. Nuclear Arsenal Can Deter Both China and Russia", Foreign Affairs, 5 October 2023, https://www.foreignaffairs.com/united-states/us-nuclear-arsenal-can-deter-both-china-and-russia

30 Ibid.

31 Ibid.

32 Ibid.

33 Ibid.

34 Jerome D. Frank, "The Nuclear Arms Race and the Psychology of Power: The Medical Implications of Nuclear War", (The Johns Hopkins University School of Medicine Baltimore, 1986), 475, https://www.ncbi.nlm.nih.gov/books/NBK219176/

The *ability* to prevail, however, assumes confidence that the enemy's every nuclear weapon, every missile silo, is destroyed before launch—otherwise the appearance of security, given the potential scale of nuclear devastation, is empty.

If space allowed, a strategy of 'damage limitation' would warrant discussion here—that is, measures to reduce losses to civilians, civilian infrastructure and the economy in the event of nuclear conflict. These precautions would likely be in place in nuclear-armed States whether or not an arms race was underway, but the greater the size of nuclear arsenals the greater the difficulty in limiting damage from any resulting nuclear war. In this regard, it is worth noting the view of a military commentator that the: *"most dangerous fallacy of all in strategic nuclear planning [is] that there is a difference between 'limited' and 'all-out' nuclear war, between 'counterforce' strikes aimed at military and war-related targets, and 'countervalue' strikes against population centres and civilian infrastructure".*[35]

*"While the United States may approach the build-up question from a political rather than a military perspective, impetus towards a nuclear arms race is likely influenced by reactions and perceptions of potential adversaries."*

In the fog of war, time and again, civilians are caught in the cross-fire—an inevitability in nuclear war with its dangerous radioactive fallout.

Perceptions by leaders of China, the Russian Federation and the United States may, however, be formed or informed by what has been known since the early days of the Cold War as the stability-instability paradox. A study by Robert Rauchhaus published in the *Journal of Conflict Resolution* in 2009[36] applying that paradox concluded that:

- nuclear weapons promote strategic stability through preventing large scale wars (that is, 'World Wars') but simultaneously allow for more lower intensity (non-nuclear/conventional) conflicts; and
- when one State has nuclear weapons but their opponent does not, there is a greater chance of war, (for example, in the case of the Russian Federation and Ukraine); but
- in contrast, when both sides possess nuclear arms, the odds of war drop precipitously[37] (for example, in the case of India and Pakistan). The emergence of China as a nuclear power comparable to the Russian Federation and the United States post-dated the 2009 evaluation.

Michael Krepon writes that the stability-instability paradox assumes that rational actors will wish to avoid nuclear wars as untenable, and will neither initiate major conflicts nor allow minor conflicts to escalate

35 Thomas Nichols, "No Use: Nuclear Weapons and U.S. National Security", (University of Pennsylvania Press, 2014), 103.

36 Robert Rauchhaus, "Evaluating the Nuclear Peace Hypothesis: A Quantitative Approach", Journal of Conflict Resolution 53, no. 2 (April 2009) https://doi.org/10.1177/0022002708330387

37 Ibid.

into major conflicts—"thus making it safe to engage in minor conflicts".[38] During the Cold War, the Soviet Union and the United States avoided coming to blows themselves, but as noted already fought a number of proxy wars[39] aimed at gaining relative influence with States that remained non-aligned with either NATO (US aligned) or the Warsaw Pact (Soviet aligned).

Referring to Robert Jervis' 1984 publication *The Illogic of Nuclear Strategy*, Krepon endorses the validity of Jervis' point that, such is the destructive power of nuclear weapons, adversaries possessing nuclear weapons would exercise caution to avoid major wars and any crossing of the nuclear threshold.[40] At the same time, the 'insurance policy' of their ability to inflict nuclear retaliation gave them scope to engage in crisis-provoking behaviour, proxy wars, and mischief-making to the extent that their adversary was prepared to tolerate.

Importantly, Krepon observes that the stability-instability paradox is at its most "harrowing" at the onset of a nuclear competition. With specific reference to arms racing, he notes that relations between adversaries can deteriorate "when nuclear weapons are added to their disagreements".[41] The risks of such deterioration in current circumstances, though difficult to gauge precisely, are not negligible particularly given the fluidity of the Russian Federation–Ukraine conflict (and wider tensions between the Russian Federation and NATO), anxiety about China's expanding nuclear arsenal (China v. United States) and its Taiwan policy, and the apparent warming in relations between China and the Russian Federation (China/Russian Federation v. United States). In short, current strategic calculations are especially complex and fraught.

## 2. Risks for the NPT

The Nuclear Non-Proliferation Treaty (NPT) is the cornerstone of the global nuclear order. All States, whether party to it (191) or not (5), are affected by the well-being of that order.[42] Even without the emergence of a nuclear arms race, the NPT is under stress.

The NPT's two most recent Review Conferences (in 2015 and 2022) failed to achieve consensus outcomes. Under the nuclear disarmament pillar of the Treaty, strong disagreement exists which can be broadly characterized as a fundamental difference of opinion between those States that eschew nuclear weapons for their security and those States that rely for their security on nuclear arms either as actual possessors of nuclear arms or as allies of those possessors. The Treaty is primarily kept together by ongoing support for its nuclear non-proliferation pillar (and to a lesser extent for its pillar on peaceful use).

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38 Michael Krepon, "The Stability-Instability Paradox", Arms Control Wonk, 2 November 2010, https://www.armscontrolwonk.com/archive/402911/the-stability-instability-paradox/; see also Krepon's and Nayak's comment: "The stability-instability paradox is by no means a sure thing. Like other corollaries of deterrence theory, the stability-instability paradox 'works' only until it fails. And one failure could be catastrophic"; Nayak and Krepon, "US Crisis Management in South Asia's Twin Peaks Crisis", Stimson Center, 9.

39 For example in Afghanistan, Angola, the Korean Peninsula, Nicaragua, Viet Nam.

40 Krepon, op cit. "The Stability-Instability Paradox".

41 Krepon, op cit.

42 The Democratic People's Republic of Korea, India, Israel, Pakistan, and South Sudan; see more at https://treaties.unoda.org/t/npt/participants


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An arms race, if it served to increase insecurity among non-nuclear-armed neighbours of the arms racers, could conceivably precipitate a proliferation of nuclear weapons, thus dealing a serious blow to a key tenet of the NPT and to global security.

Any build-up of nuclear arms would also contradict the NPT obligation to "pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament".[43] Further proliferation of nuclear arms in an arms race would not be welcomed by non-nuclear-weapon States which have foresworn nuclear arsenals in the belief—for most of them—that the world would be a safer place without nuclear weapons. In the absence of a no-first-use treaty or a 'sole purpose' policy,[44] the task of reducing the risks of nuclear arms races and nuclear conflict would leave humanity dependent on (a) the five NPT nuclear weapon States' Joint Statement in 2022 affirming the 'non-use' premise that nuclear weapons serve defensive purposes, deter aggression and prevent war; (b) the normative force of the Treaty on the Prohibition of Nuclear Weapons (TPNW) and (c) on the 'social force' inherent in the long-standing nuclear taboo.

In any event, nuclear arms racing would likely complicate arms control negotiations let alone general disarmament, while further devaluing commitments made under the 2000 and 2010 NPT Final Documents at a time when the level of trust and accountability in NPT Review cycles is approaching unsustainability.

A further comment on the risks for the NPT of a nuclear arms race is that in the Treaty, risk reduction has only in recent years secured a firm place in its implementation. Yet given the potential of devastation with cross-boundary effects, any nuclear weapon detonation, whatever its cause, is a matter of concern for the entire NPT membership, not solely the five nuclear-weapon States. As a matter of universal concern, it

43 NPT, art. VI, https://treaties.unoda.org/t/npt

44 See Steve Andreason, "Declaratory Policy: Advancing Sole Purpose", Nuclear Threat Initiative, https://media.nti.org/documents/Declaratory_Policy_Advancing_Sole_Purpose_-_Andreasen_Excerpt.pdf

should thus lend itself to the development of *mutual* points of agreement among all NPT interest groups.[45] This scope for bridging the chasm of disagreement among nuclear-weapon States, their nuclear umbrella allies, and the bulk of non-aligned and other members bears further nurturing—hardly possible in today's global security climate, let alone in one involving an arms race, but all the more pertinent nonetheless.

## 3. Nuclear Deterrence Risks

Deterrence calculations will determine the question whether the United States and the Russian Federation decide in a post-New START era to strengthen their nuclear arsenals which in turn may influence the level at which China sets its current expansion. The point at which the three powers individually assess that a strategic balance will be attained and that no further build-up is required is just that—an individual calculation. There is no magic figure, whether in warheads counted or in delivery systems developed or strategies devised, at a chequered flag can be waved for an arms race. 'Parity' of strategic armoury in the secretive world of the nuclear industrial complex and without agreed arms control measures is necessarily a rough and ready measure. At most it amounts to a perception of balance—as noted earlier, the Cold War arsenals, though enormous, were far from identical. Arms control treaties, however, can in effect establish parity. The deterrent potential of a nuclear force is comprised of more elements than just those of weapons numbers, but as between the Russian Federation and the United States can be assumed from the terms of New START to be currently 1,550 deployed 'accountable' weapons each, the levels agreed bilaterally in 2011.[46]

If the growth of China's nuclear arsenal discomforts and disturbs that level of agreed parity and New START falls by the wayside, all bets are off in an already tense global environment. With recently increased international focus[47] on the risks inherent in relying on the doctrine of nuclear deterrence, a tripartite build-up of nuclear weapons would scarcely be reassuring. It can be argued that a build-up might, as in the Cold War, create an impulse for arms control,[48] but why wait—there is no shortage of calls for arms reduction diplomacy in place of powerplays.[49] Relying on nuclear deterrence to avoid recourse to war in an arms race is a gamble with the highest stakes, not least for the efficacy of the doctrine of nuclear deterrence in which nuclear powers and their allies place such faith—the failure of nuclear deterrence being tantamount to nuclear war.

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45 Peter Maurer, (then) President of the ICRC, "The humanitarian impact of nuclear weapons: key findings on the consequences and risks of, and the response capabilities regarding, nuclear weapon explosions"— 32nd International Conference of the ICRC and IFRC, 8 December 2015, https://www.icrc.org/en/document/international-conference-opening-address-icrc-president. See Understanding Nuclear Weapon Risks, "greater policy exploration of nuclear weapon risks would allow issues around these weapons to be considered in a different way, and so be especially helpful for constructive engagement with nuclear-armed States", 8 https://unidir.org/files/publication/pdfs/understanding-nuclear-weapon-risks-en-676.pdf

46 New START Treaty (entry into force 5 February 2011), US Department of State, https://www.state.gov/new-start/

47 Alexander Kmentt, "Time to Engage Seriously with the TPNW's Security Concerns", European Leadership Network, 4 June 2024, https://europeanleadershipnetwork.org/commentary/time-to-engage-seriously-with-the-tpnws-security-concerns/

48 Council on Foreign Relations, "1949 – 2021 U.S.-Russia Nuclear Arms Control", https://www.cfr.org/timeline/us-russia-nuclear-arms-control

49 For example, The Elders, "Nuclear Weapons. The Impact We Seek: Current and Future Generations Are Free from the Threat of Nuclear Destruction", https://theelders.org/programmes/nuclear-weapons

China may believe that, consistently with the Rauchhaus 2009 study mentioned earlier,[50] its own security will be enhanced by establishing a nuclear arsenal of greater size to deter aggression whether from its nuclear rivals or those whose arsenals consist solely of conventional weapons. But an unrestrained arms race especially in its early stages will almost certainly stoke existing tensions and, as the Cuban missile and Two Peaks crises showed, heighten the risks of devastating consequences.

The extent to which other nuclear-weapon States will recalibrate their deterrence calculations on developments in China, the Russian Federation and the United States remains to be seen but since the conflict between the Russian Federation and Ukraine has given rise in France and the United Kingdom to consideration of such need.[51]

The three nuclear-armed States that are the focus of this paper all possess powerful conventional forces in addition to their nuclear arsenals, adequate alone to deter each other from attack without the need to fall back on their nuclear arms. In any event, nuclear deterrence depends for its effectiveness on a nuclear-armed enemy believing not so much that there is a risk that nuclear weapons will be used to repulse its attack, but that such a risk is a reasonably high one. As that situation has never arisen, the odds against it happening are low but cannot be said to be zero.[52] While the nuclear-use taboo has lasted eight decades, securing the commitment of nuclear-armed States to commit legally to non-use of nuclear weapons, to concerted, phased nuclear disarmament, and to time-bound elimination of nuclear warheads remains elusive.

*"Nuclear deterrence depends for its effectiveness on a nuclear-armed enemy believing not so much that there is a risk that nuclear weapons will be used to repulse its attack, but that such a risk is a reasonably high one."*

Another deterrence risk from a nuclear arms race is that deterrence as already noted is not only about the numbers. If, for example, one State is increasing its warheads in size and volume, as well as the capability of its delivery systems, another State can try to bridge the deterrence gap through other means—deployments closer to the adversary, changes to doctrine, more rhetoric, more pointed exercise manoeuvres, all of which may exacerbate nuclear risks. Similarly, States' leaders can perceive increases in nuclear arsenals of adversaries as an attempt to destabilize an existing deterrence balance—potentially to attack first—and might feel compelled to arms-race in order to reestablish deterrence. In practical terms, perceptions of deterrence instability and plans to develop missile defence shields may exacerbate relations between states, or at least complicate rapprochement.

50 Rauchhaus, "Evaluating the Nuclear Peace Hypothesis".

51 See for example Hans M. Kristensen et al, "French Nuclear Weapons, 2025", Bulletin of the Atomic Scientists, 15 July 2025, https://thebulletin.org/premium/2025-07/french-nuclear-weapons-2025/, and Lee Willet, "Feature: UK Considering Second Nuclear System to Bolster European Deterrence", Janes, 19 August 2025, https://www.janes.com/osint-insights/defence-news/defence/feature-uk-considering-second-nuclear-system-to-bolster-european-deterrence

52 John Borrie, Tim Caughley and Wilfred Wan, "Understanding Nuclear Weapon Risks", (UNIDIR, 2017), 24, https://unidir.org/publication/understanding-nuclear-weapon-risks/

## 4. Humanitarian Risks

The risk that an arms race could pose as a consequence of the production of more nuclear weapons and a consequential heightening of international tensions leading directly to nuclear war is not readily quantified. But given current levels of global insecurity, it is difficult not to conclude that fewer nuclear weapons and a significant lowering of tensions would serve humanity better than the reverse.

Significantly, the General Assembly recently tasked an independent scientific panel to examine the *"physical effects and societal consequences of a nuclear war on a local, regional and planetary scale, including, inter alia, the climatic, environmental and radiological effects, and their impacts on public health, global socioeconomic systems, agriculture and ecosystems, in the days, weeks and decades following a nuclear war".*[53]

Depending on its size and where and how it was detonated, a single nuclear warhead, used perhaps simply as a demonstration of intent (that is, an incentive for de-escalation), could replicate or surpass the casualties and damage suffered by Hiroshima and Nagasaki in 1945.[54] In an exchange of nuclear weapons, losses and suffering would be exponentially worse, making all-out use of nuclear arsenals unthinkable.

A 'surgical strike' using a nuclear weapon is a misnomer. Situations requiring pinpoint, constrained detonations are the realm of conventional weapons, not nuclear weapons with their legacy of radiation. If an arms race culminated in warfare confined to the use only of conventional arms (without recourse to prohibited weapons of mass destruction[55]), the consequences might be small scale (as in a single demonstration of intent) but they might escalate for whatever reason (for example, desperation in self-defence) to the point where nuclear weapons are used.

Nuclear war has the potential to cause humanitarian consequences beyond all previous examples of recourse to arms. The point is, whatever possible strategic advantage might be achieved would come with a cost the risk of which is untenable. Moreover, it is unlikely that the United Nations would to be able to offer much humanitarian assistance in the immediate aftermath of a nuclear weapon detonation (accidental or deliberate) let alone the State or States affected. The radioactive fallout of such an explosion would immediately complicate the task of the United Nations humanitarian system to deploy both in time and scale.[56]

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53 See Austria et al, "Nuclear War Effects and Scientific Research", A/C.1/79/L.39, para. 3, 15 October 2024, https://docs.un.org/en/A/C.1/79/L.39. This resolution seeks to establish an independent scientific panel on the effects of nuclear war. It was approved by a recorded vote of 144 in favour to 3 against (France, Russian Federation, United Kingdom), with 30 abstentions. The panel will consist of 21 members to be appointed by the Secretary-General and will report to the General Assembly in 2027. See more at https://press.un.org/en/2024/gadis3754.doc.htm

54 Alex Wellerstein, "Counting the Dead at Hiroshima and Nagasaki", Bulletin of the Atomic Scientists, 4 August 2020, https://thebulletin.org/2020/08/counting-the-dead-at-hiroshima-and-nagasaki/

55 That is, all three classes of WMD — biological and toxin weapons (BWC 1972), chemical weapons (CWC 1992), and nuclear weapons (TPNW 2017); for more information see https://disarmament.unoda.org/wmd/

56 John Borrie and Tim Caughley, "An Illusion of Safety, Challenges of Nuclear Weapon Detonations for United Nations Humanitarian Coordination and Response", (UNIDIR, 2014), 77, https://unidir.org/publication/an-illusion-of-safety-challenges-of-nuclear-weapon-detonations-for-united-nations-humanitarian-coordination-and-response/

## 5. Financial Risks

Anecdotally, the superior size of the Soviet nuclear arsenal came at a cost—a financial one: the Cold War arms race eventually "put an economically and technologically declining Soviet Union at such a steep competitive deficit that its leaders… opted to sue for peace".[57] On the other hand, while that arms race was a "reminder of how the search for security could cause existential insecurity instead", some experts attribute the bilateral arms control treaties that followed as "in part, an effort to reduce this insecurity by capping the superpowers' nuclear arsenals and constraining … capabilities that were considered destabilizing".[58] In other words, aggressive arms-racing actually enabled historic arms control. Mutual assured destruction—the notion that no one could win a nuclear arms race and that it was dangerous to try—was born.

Nonetheless, if the United States is to preserve a *conventional* edge vis-à-vis China and the Russian Federation simultaneously, let alone increasing the size of its nuclear arsenal, greater defence spending may be needed.[59] As already noted, arms races are not just matters of quantity—some experts point out that maintaining a favourable balance of power will "equally require exploiting U.S. advantages in missile accuracy, … the intelligence, surveillance, and reconnaissance capabilities that provide unparalleled global awareness … and other qualitative factors".[60] Costly investments in new technologies as well as additional nuclear warheads would be needed. Conceivably, such development would raise the risk of a resumption of nuclear testing. Even the modernization of existing nuclear weapons consumes enormous amounts of public funding (for example, the current projected costs of US nuclear forces for 2025–2034 amount to almost 1 trillion dollars,[61] that is, 100 billion dollars per annum) that might be better put to civil uses.

57 Brands, "The Art of the Arms Race", Foreign Policy. See also a remark to Mikael Gorbachev by Ronald Reagan (according to the latter's assistant, Jim Kuhn): "Mr General Secretary, you can never win an all out arms race with the United States because we will always have the ability to outspend you"; David Smith, "Gorbachev and Reagan: The Capitalist and Communist Who Helped End the Cold War", The Guardian, 21 August 2022, https://www.theguardian.com/world/2022/aug/31/gorbachev-and-reagan-the-capitalist-and-communist-who-helped-end-the-cold-war

58 Brands, ibid.

59 See Daryl G. Kimball, "Nuclear Challenges facing the Next U.S. President", Arms Control Today, December 2024, https://www.armscontrol.org/act/2024-12/focus/nuclear-challenges-facing-next-us-president; Kimball notes that "in response, congressional Republicans and the authors of the Project 2025 plan want Washington to spend even more than the current $756 billion for nuclear modernization to increase the number and diversity of the arsenal. Such a buildup would reverse 35 years of Russian-U.S. reductions, is not necessary to deter nuclear attack… and would prompt China and Russia to match any U.S. increase".

60 Brands, "The Art of the Arms Race", Foreign Policy.

61 Congressional Budget Office, "Projected Costs of U.S. Nuclear Forces, 2025 to 2034", April 2025, https://www.cbo.gov/publication/61224

## 6. Risk of Inadvertent Use

There have been numerous close calls involving nuclear weapons.[62] Evidence from declassified documents and interviews suggests that the world has "been lucky, given the number of instances in which nuclear weapons were nearly used inadvertently as a result of miscalculation or error".[63]

On the supposition that the more weapons the greater the chances of accident, inadvertence, miscalculation or error, a nuclear arms race would exacerbate risks currently present—perhaps via new types of weapons, different testing conditions, less experienced or inadequately resourced personnel, or misunderstandings about a rival's intentions.

Of relevance to current concern about the role of artificial intelligence in weapons systems,[64] historical cases of nuclear near-use demonstrate the importance of the human judgment factor in nuclear decision-making. Recent incidents, such as the 2009 collision of French and UK submarines,[65] suggest cause for concern over safety and security measures and command and control. To minimize misunderstandings, Lewis and Unal[66] have emphasized the vital need of open lines of communication between adversaries during crises. As a Chatham House study by Patricia Lewis, Benoît Pelopidas and Heather Williams stated, "those who possess nuclear weapons will continue to be distrustful of one another and remain reliant on data transmitted by systems that are vulnerable to error or misjudgment, particularly when leaders have to respond too quickly to be able to make fully informed decisions".[67]

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62 See for example Sico van der Meer, "Reducing Nuclear Weapons Risks", Clingendael (June 2018), https://www.clingendael.org/sites/default/files/2018-06/PB_Reducing_nuclear_weapons_risks.pdf; Scott D. Sagan, "The Limits of Safety, Organizations, Accidents, and Nuclear Weapons", (Princeton University Press, 1993); Eric Schlosser, "Command and Control: Nuclear Weapons, the Damascus Accident, and the Illusion of Safety", (Penguin Books, 2013); Patricia Lewis, Heather Williams, Benoît Pelopidas and Sasan Aghlani, "Too Close for Comfort: Cases of Near Nuclear Use and Options for Policy", Chatham House (2014), https://www.chathamhouse.org/2014/04/too-close-comfort-cases-near-nuclear-use-and-options-policy; and Wilfred Wan, "Nuclear Risk Reduction: A Framework for Analysis", (UNIDIR, 2019), https://unidir.org/nuclear-risk-reduction-a-framework-for-analysis/

63 Lewis, Williams, Pelopidas and Aghlani, "Too Close for Comfort".

64 See, for example, Tshilidzi Marwala, "Militarization of AI has Severe Implications for Global Security and Warfare", United Nations University, 24 July 2023, https://unu.edu/article/militarization-ai-has-severe-implications-global-security-and-warfare; and Matthias Klaus, "Transcending Weapon Systems: The Ethical Challenges of AI in Military Decision Support Systems", Humanitarian Law & Policy, 24 September 2024, https://blogs.icrc.org/law-and-policy/2024/09/24/transcending-weapon-systems-the-ethical-challenges-of-ai-in-military-decision-support-systems/

65 John F. Burns, "French and British Submarines Collide", New York Times, 16 February 2009, https://www.nytimes.acom/2009/02/17/world/europe/17submarine.html

66 Patricia Lewis and Beyza Unal, "Nuclear Risks: Humanitarian Consequences, Probabilities and Mitigation", in Civil Society and Disarmament (UNODA, 2017), 8–15, https://doi.org/10.18356/4148738f-en

67 Patricia Lewis and Beniot Pelopides, "Too Close for Comfort: Cases of Near Nuclear Use and Options for Policy", Chatham House Report (May 2023), vi, https://www.chathamhouse.org/2014/04/too-close-comfort-cases-near-nuclear-use-and-options-policy

> *"Historical cases of nuclear near-use demonstrate the importance of the human judgment factor in nuclear decision-making. Recent incidents, such as the 2009 collision of French and UK submarines, suggest cause for concern over safety and security measures and command and control."*

The Chatham House study—which applied a risk lens based on factoring probability and consequence—concluded that, since the probability of inadvertent nuclear use is "not zero and is higher than had been widely considered", and because the consequences of detonation are so serious, the risk of an inadvertent, accidental or deliberate detonation of a nuclear weapon must be considered high. Until the elimination of nuclear arms, "vigilance and prudent decision-making in nuclear policies are therefore of the utmost priority".[68] In managing this risk, policy-makers and militaries should particularly:

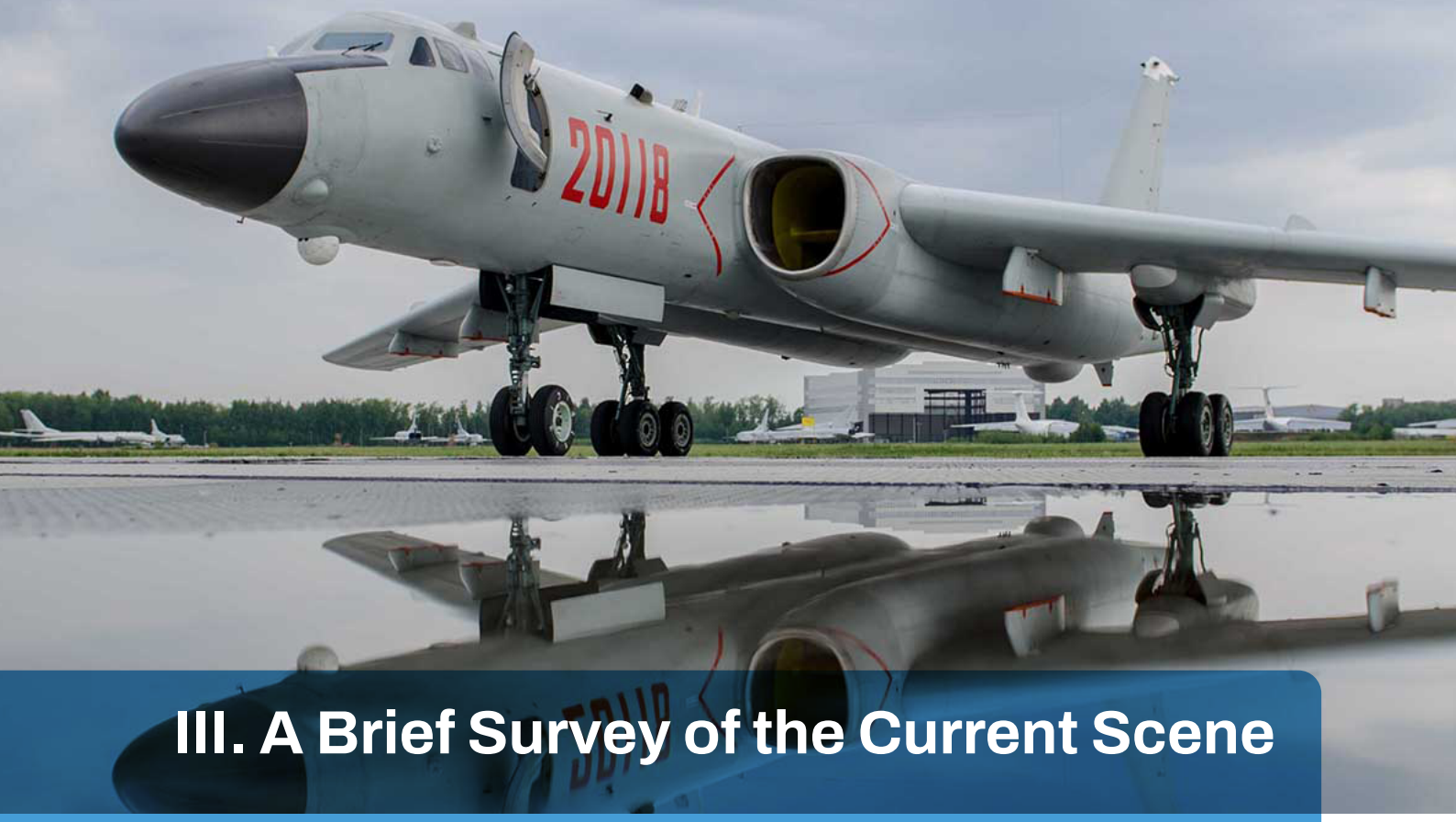
- buy time for decision-making, particularly in crises;
- develop trust and confidence-building measures;
- refrain from large-scale military exercises during times of heightened tension (such as during arms racing);
- involve a wider set of decision makers in times of crisis;
- establish 'hotline' channels of communications between adversaries; and
- improve awareness and training on the effects of nuclear weapons.

Under this heading, the risks arising from false alarms also need mention, including the potential impact of artificial intelligence on early warning systems, an aspect beyond the scope of this paper. In essence, this is the as-yet unresolved issue of need for human involvement in decision-making in automated weapon systems.

Current and future technological developments may be one source of risk, but may conceivably help reduce risks. If and until that point is reached, Frank has noted that nuclear weapons allow "virtually no margin for error" and refers to the observation of historian Henry Steele Commager that "(t)echnologically for the first time we've reached the stage of the irretrievable mistake".[69] An arms race that increases the number of nuclear weapons will increase the risk of accidental detonation.

68 Ibid.

69 Jerome D Frank, "The Nuclear Arms Race and the Psychology of Power", The Medical Implications of Nuclear War, Preface. 479, https://doi.org/10.17226/940



# III. A Brief Survey of the Current Scene



Arms race definitional issues aside, there is a broader context in which to assess the existence today of a nuclear arms race. In the deteriorating global security environment during the past decade, the narrative surrounding nuclear weapons has had several strands—on the one hand delegitimizing nuclear arms by prohibiting them[70] and accelerating nuclear disarmament,[71] and on the other hand the possibility of actual use of a nuclear weapon[72] and the expansion of nuclear arsenals[73] foreshadowing an arms race either already underway or in contemplation.

As to whether an arms race is happening now or imminent, this paper assumes that while there may be an element of competition in China's reported efforts to expand its nuclear arsenal,[74] there is little sign yet of the concerted competition—emergence of an 'action-reaction cycle'[75]—such as occurred between

70 See Treaty on the Prohibition of Nuclear Weapons, A/CONF.229/2017/8, 7 July 2017, https://docs.un.org/en/A/CONF.229/2017/8

71 See, for example, General Assembly, "Towards a Nuclear-Weapon-Free World: Accelerating the Implementation of Nuclear Disarmament Commitments", A/RES/78/42, 6 December 2023, https://documents.un.org/doc/undoc/gen/n23/389/54/pdf/n2338954.pdf

72 See, for example, PBS News, "Putin Formally Lowers Threshold for Using Nuclear Weapons", 19 November 2024, https://www.pbs.org/newshour/world/putin-formally-lowers-threshold-for-using-nuclear-weapons

73 Hans M. Kristensen, Matt Korda, and Eliana Reynolds, "Chinese Nuclear Weapons", Bulletin of the Atomic Scientists 79, no. 2, (March 2023), https://doi.org/10.1080/00963402.2023.2178713

74 See Andrew F. Krepinevich Jr., "The New Nuclear Age: How China's Growing Nuclear Arsenal Threatens Deterrence", Foreign Affairs (April 2022), https://www.foreignaffairs.com/articles/china/2022-04-19/new-nuclear-age

75 Matthew Kroenig, "Arms Racing Under Nuclear Tripolarity: Evidence for an Action-Reaction Cycle?", Atlantic Council (20 December 2022), https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/arms-racing-under-nuclear-tripolarity-evidence-for-an-action-reaction-cycle/

the Soviet Union and the United States during the Cold War. That may change, though, if the Russian Federation and the United States ultimately move beyond New START limits. In arms race parlance, the theory of 'action-reaction'[76] as in the Cold War is that a nuclear-weapon State must have nuclear arms parity with its adversary or adversaries to successfully deter them. In the case of the United States, this has been described by experts as being driven more by domestic political expediency than military necessity.[77]

> *"While they may be an element of competition in China's current efforts to expand its nuclear arsenal, there is little sign yet of the concerted competition—the emergence of an "action-reaction cycle"— that occurred between Russia and the United States during the Cold War"*

According to SIPRI, China's nuclear arsenal increased from 410 warheads in January 2023 to 500 in January 2024, and is expected to keep growing. Depending on how it decides to structure its forces, China could potentially have at least as many intercontinental ballistic missiles (ICBMs) as both the Russian Federation and the United States by the turn of the decade, although its stockpile of nuclear warheads is still expected to remain much smaller than the stockpiles of either of those two States. The Office of the US Secretary of Defense's 2022 'Military and Security Developments Involving the People's Republic of China' reported that "If China continues the pace of its nuclear expansion, it will likely field a stockpile of about 1500 warheads by its 2035 timeline".[78] Whether that is so, China's official position is that it does not seek to pursue a nuclear arms race.[79] Concern, however, about China's build-up and possible cooperation with the Russian Federation has led some observers to consider whether the United States should increase its arsenal in response.[80]

Worryingly, if New START expires in February 2026, limits on the nuclear arsenals of United States and the Russian Federation will cease. Bilateral discussions on negotiating a replacement of New START are seemingly suspended although both parties maintain that they continue to abide by those ceilings. There exists, however, the possibility of increases by the Russian Federation of non-strategic nuclear weapons

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76 We do not want a nuclear arms race with the Soviet Union — primarily because the action-reaction phenomenon makes it foolish and futile." McNamara Speech on U.S. Nuclear Strategy. 18 September 1967. CQ Almanac. https://library.cqpress.com/cqalmanac/document.php?id=cqal67-1313223#_=_

77 Tom Z. Collina, "How many nuclear warheads does the United States need? Bulletin of the Atomic Scientists", 19 September 2024, https://thebulletin.org/2024/09/how-many-nuclear-warheads-does-the-united-states-need-2/, and William J. Perry and Tom Z. Collina, "The New Nuclear Arms Race and Presidential Power from Truman to Trump", Simon and Schuster, https://www.simonandschuster.com/books/The-Button/William-J-Perry/9781948836999

78 US Department of Defense, "Military and Security Developments Involving the People's Republic of China", (2022), ix, https://media.defense.gov/2022/Nov/29/2003122279/-1/-1/1/2022-MILITARY-AND-SECURITY-DEVELOPMENTSINVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF

79 Statement by Ambassador Shen Jian, thematic debate on nuclear weapons, seventy-ninth session of the General Assembly, 22 October 2024, http://un.china-mission.gov.cn/eng/chinaandun/disarmament_armscontrol/202412/t20241220_11507590.htm

80 See for example Congressional Research Service's Report, "Great Power Competition: Implications for Defense—Issues for Congress", 28 August 2024, https://sgp.fas.org/crs/natsec/R43838.pdf

and development by the United States of submarine-launched cruise missiles.[81] Of concern also is the suspension by the Russian Federation in 2023 of the monitoring measures laid down in New START, in reaction to which the United States followed suit.

Drawing on the SIPRI Yearbook of 2024,[82] the current status of the nuclear arsenals of China, the Russian Federation and the United States can be summarized briefly as follows: of the total global inventory of an estimated 12,121 warheads in January 2024, about 9,585 were in military stockpiles for potential use. An estimated 3,904 of those warheads were deployed with missiles and aircraft—60 more than in January 2023—and the rest were in central storage. Around 2,100 of the deployed warheads were kept in a state of high operational alert on ballistic missiles. Nearly all of these warheads belonged to the Russian Federation or the United States, but for the first time China is believed to have some warheads on high operational alert. The Russian Federation and the United States together possess almost 90 per cent of all nuclear weapons (deployed, stockpiled, or awaiting decommissioning). The sizes of US and Russian military stockpiles (that is, useable warheads) appear to have remained relatively stable in 2023.

In any event, for the purposes of this paper, determining the existence or not today of an arms race and speculating on what will amount to parity or even approximate parity among three already highly armed nuclear States is secondary to the generic question: in an already tense global security climate, what risks might the emergence of a palpable, competitive build-up among the three leading nuclear-weapon powers hold? How can they be managed?

81 Xiaodon Liang, "U.S. Starts Work on Nuclear-Capable Missile", Arms Control Today, July/August 2024, https://www.armscontrol.org/act/2024-07/news/us-starts-work-nuclear-capable-missile

82 Hans M. Kristensen and Matt Korda, "World Nuclear Force". In SIPRI Yearbook 2024 (SIPRI, 2024).

# IV. Managing the Risks of an Arms Race

© Security Council Considers Non-Proliferation of Weapons of Mass Destruction, UN Photo/Mark Garten, New York, 2018.

The recipe for managing six areas of arms race risks identified in this paper has many ingredients. As the paper focuses on the three major powers, what follows relates to their actions alone, individually or collectively in no strict order.

**Relations between the Nuclear Powers:** A negotiated end to the war in Ukraine might overcome barriers to constructive engagement between the Russian Federation and the United States.[83] Likewise, finding a common ground around key economic and political disagreements could dampen rivalry between Washington and Beijing. In the United Nations Security Council, reduced tensions between/among the Permanent Members would help the dynamics in the Council, lowering tensions to a level that eases incentives to arms race.

**Arms control:** Arms control measures can play an important role in managing the risks of an arms race. This could entail:

- renewal of New START, or agreement by the Russian Federation and the United States to observe in full the current agreement until renewal negotiations are completed;

83 According to Jessica T. Mathews, distinguished fellow at the Carnegie Endowment for International Peace who served as Carnegie's president for 18 years; see Jessica T. Mathews, "A New Nuclear Arms Race is Beginning: It Will be Far more Dangerous than the Last One", The Guardian, 14 November 2024, https://www.theguardian.com/world/2024/nov/14/nuclear-weapons-war-new-arms-race-russia-china-us

- renewal of US efforts to engage China on arms control issues including missiles. According to Mathews, the leaders of the Russian Federation and China have reportedly discussed parallel moratoriums on intermediate-range nuclear missiles in Europe and Asia.[84]

**Diplomacy and communication:** The higher the stakes in a crisis the greater the need for bi- and tri-lateral channels for finding solutions or at least for discussing the possible consequences of failure to find solutions. These channels, whatever their levels and whether political or military, should be established in times of comparative peace between potential arms race competitors and carefully sustained through crises. Glaser, Acton and Fetter note that the "important point is that the key approach for reducing these [arms race] dangers will be diplomacy, including communication in times of both peace and crisis".[85] When diplomacy has proved unavailing, if not before, the actual means of communication—a 'hotline' between leaders—is essential. Washington and Moscow need to rebuild lines of communication that enabled the United States and the Soviet Union to survive the Cold War.[86] As Schlosser has written "The glaring problem of how the President of the United States and the President of [the Russian Federation] might reliably communicate and negotiate during a limited nuclear war has never been resolved".[87] Channels with China should also be enhanced.

*"The higher the stakes in a crisis the greater the need for bi- and tri-lateral channels for finding solutions or at least for discussing the possible consequences of failure to find solutions."*

**Multilateral:** In addition to improving Security Council functionality as just noted, greater resolve and leadership is required in forums such as (a) the Conference on Disarmament (CD) where all nuclear-armed powers are members and on the agenda of which is a measure fundamental to arms control and to forestalling arms racing—the negotiation of a treaty to ban the production of the key components of nuclear weapons (that is, fissile materials).[88] One of the CD's Subsidiary Bodies covers 'Cessation of the Nuclear Arms Race and Nuclear Disarmament; (b) in the NPT five-yearly Review Process. Lowering the temperature in relations between larger nuclear powers ought to be contagious in these bodies. Restoring trust should be facilitated by embarking first on issues that are the most fertile for rebuilding good will, including nuclear risk reduction as mentioned earlier.

84 See also Mathews, "A New Nuclear Arms Race is Beginning." The Guardian. Ibid.

85 Glaser, Acton and Fetter, "The U.S. Nuclear Arsenal Can Deter Both China and Russia".

86 Ibid.

87 Eric Schlosser, "The Growing Dangers of the New Nuclear-Arms Race", The New Yorker, 24 May 2018, https://www.newyorker.com/news/news-desk/the-growing-dangers-of-the-new-nuclear-arms-race

88 See Pavel Podvig, "Taking Stock of the Fissile Material Cut-off Treaty Process", (UNIDIR, 2024), https://doi.org/10.37559/WMD/24/FMCT/1

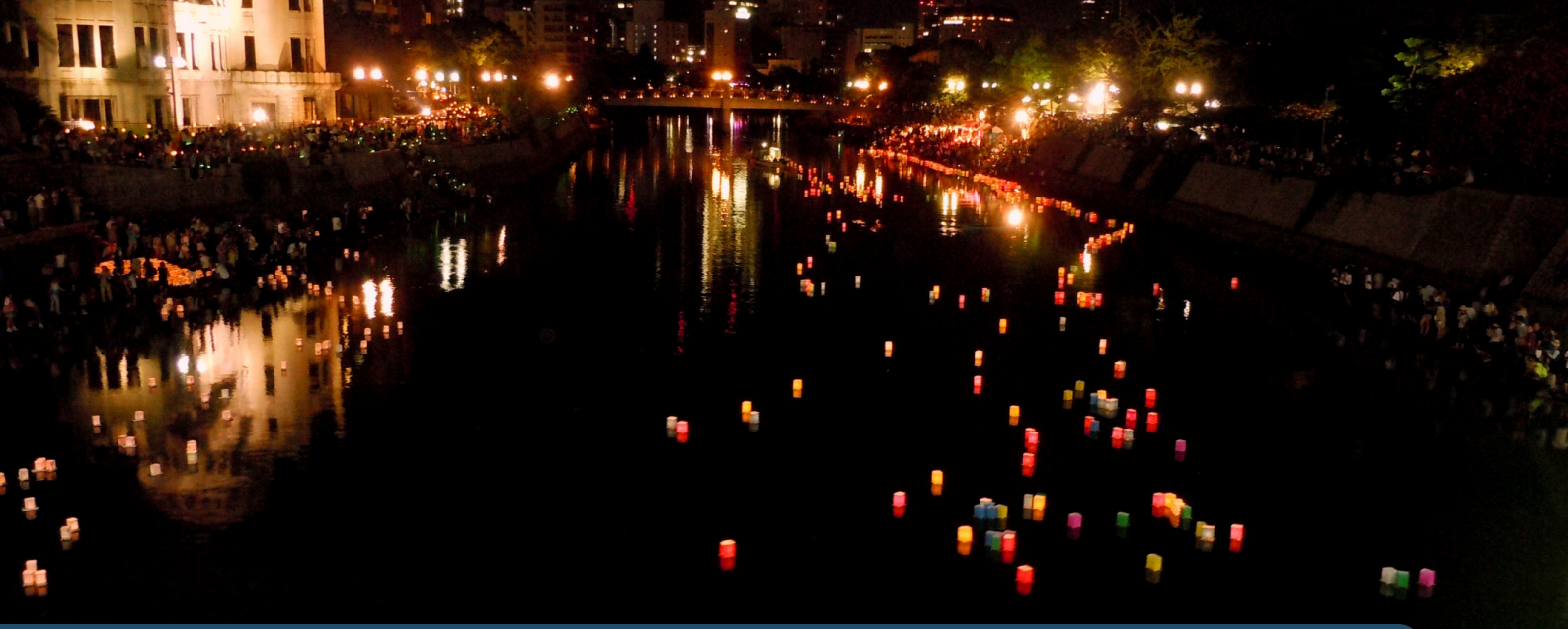
**Public opinion:** Mathews argues that while "the climate crisis has replaced nuclear war as the main existential threat in the public mind ... the reasons for fearing nuclear war are, if anything, greater than they once were."[89] If the heavy public pressure that influenced leaders and legislators to wind down the first arms race is to be replicated it needs greater reflection in current non-governmental research and analysis.

**Testing:** Now that there exist proven ways of simulating the reliability of nuclear warheads without needing physically to detonate them, Mathews argues there are no legitimate arguments against ratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) by the United States. Doing so would "boost global efforts to contain proliferation and rising nuclear risks".[90] Though China, the Russian Federation and the United States are signatories, they have either not yet ratified the Treaty or have rescinded ratification (the Russian Federation in 2023). Moscow's explanation was that the failure of the United States to ratify the Treaty had "created an imbalance" between the two States, "which is unacceptable in the current international situation".[91] If China, the Russian Federation and the United States mutually agreed to ratify the CTBT (re-ratify, in the Russian Federation's case), the 'imbalance' would disappear and the impetus to arms race would be impeded by their commitments not to (physically) test proposed new nuclear arms. But it is a big 'if' in the current security climate.

89 Mathews, "A New Nuclear Arms Race is Beginning".

90 Ibid.

91 President of Russia, "Law Revoking the Ratification of the Comprehensive Nuclear-Test-Ban Treaty", 2 November 2023, http://en.kremlin.ru/acts/news/72635



# Conclusions



The continued reliance on nuclear weapons for security led former United Nations Secretary-General Ban Ki-moon to say that there are "no 'right hands' that can handle these 'wrong weapons'".[92] In the same vein, the use of a sporting analogy to describe a build-up of nuclear weapons as a 'race' is inapt. There may, it is true, be a competition, but not one that has any defined course, beginning or end. There may be some guardrails, for example, fixed limits (arms controls agreements), the Geneva Conventions and the laws of armed conflict, and, in the case of the five nuclear-weapon States that are party to the NPT, a binding obligation to "pursue negotiations in good faith" relating to cessation of the nuclear arms race "at an early date".[93] But the 'arms race' in progress when the NPT was negotiated 57 years ago was the Cold War—the NPT negotiations have yet to take place even though the (first) Cold War ended 36 years ago.

Amassing nuclear arms whether by an individual State for its own reasons or in competition with another State or States entails risks of existential proportions for States individually and collectively. Some of those risks have been outlined in this paper. Are they offset by the argument that the balancing of nuclear arsenals of the major nuclear protagonists nonetheless underpins global strategic stability? A lesson from the Cold War is that while it was once the position that the grand total of Soviet and US nuclear weapons was approximately 68,000, under New START currently (for as long as it lasts) that total is about 9,000 of which a third are actually deployed. The difference of 59,000 nuclear weapons cut from the two arsenals is the enormous dividend of difficult but ultimately successful bilateral negotiations as well as Presidential Initiatives[94] and unilateral actions.

92 United Nations Secretary-General, "There Are No Right Hands that can Handle these Wrong Weapons", United Nations, 22 April 2013, https://press.un.org/en/2013/sgsm14968.doc.htm

93 NPT, art. VI.

94 See, for example, Eli Corin, "Presidential Nuclear Initiatives: An Alternative Paradigm for Arms Control", Nuclear Threat Initiative, 29 February 2004, https://www.nti.org/analysis/articles/presidential-nuclear-initiatives/

Those reductions are tacit acknowledgement by the Russian Federation and the United States that the New START limits meet their deterrence needs: in which case, does today's level of animosity between the Russian Federation and the United States warrant a new arms race even of modest proportions between them? If their existing state of security has been so seriously impaired in the 15 years since they agreed on the New START levels, how would they quantify their differences in terms of new weapons numbers against risks of the kind enumerated here, especially without first engaging in (re)negotiations? How will a return to higher holdings of nuclear weapons make them feel more secure when the opposite ultimately proved the case during the Cold War?

*"Reductions are tacit acknowledgement by the Russian Federation and the United States that the New START limits meet their deterrence needs."*

The United States and the Russian Federation may have their own reasons for responding to China's potential build-up. But they will be aware that 'parity' comes in different shapes and sizes and entails enormous expenditure. More importantly, they will be aware that competitiveness in this arena, as on the sporting field, can give rise to spiralling tensions and aggression. If the policies of the leaders during the Cold War and since still apply—that these armaments are for defensive purposes, not aggression—then today's leaders should carefully calculate in the face of a wide range of risks whether a nuclear arms race is either warranted or, in its uncertainties, fit for purpose. An activity that could have global consequences demands exhaustion first of all peaceful options. As Brands reminds us, the Cold War is "a reminder of how the search for security could cause existential insecurity instead".[95] What is needed is mutually assured security, not mutually assured destruction—through dialogue, not weaponry.[96]

95 Brands, "The Art of the Arms Race".

96 William Tobey, Pavel S. Zolotarev, and Ulrich Kühn, "The INF Quandary: Preventing a Nuclear Arms Race in Europe Perspectives from the U.S., Russia and Germany", (Russia Matters, 2019), https://www.russiamatters.org/sites/default/files/media/files/The%20INF%20Quandry%20Issue%20Brief%20Final_1.pdf

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