



TEXAS NATIONAL SECURITY REVIEW

POLICY REVIEW ROUNDTABLE:

The Future of Trans-Atlantic Nuclear Deterrence

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This January, Perry World House hosted a two-day workshop titled “Transatlantic Disruption: Challenges and Opportunities.” The essays in this roundtable emerged from a panel on the future of trans-Atlantic nuclear deterrence.

1. Introduction: Emerging Challenges to Trans-Atlantic Nuclear Deterrence

By Christian Ruhl, John Gans, and Michael C. Horowitz

For more than 70 years, scholars and policymakers have examined the role of nuclear weapons in trans-Atlantic relations. Debates and considerations took place at moments of great tension and moments of great tranquility, yet few times have been as complex as today. Discussions about the role of nuclear weapons in the trans-Atlantic alliance are occurring amid tension in the alliance, the strain of a global pandemic, the advancement of new technologies, the rise of anti-nuclear and anti-globalist voices, and new aggression by Russia in Eastern Europe.

To continue the conversation, Perry World House, the University of Pennsylvania’s hub for global affairs, convened a two-day workshop in early 2021 to discuss “transatlantic disruption.” As part of the workshop, one panel of academics, policymakers, and other experts focused on nuclear deterrence, tackling questions such as, “What should be the top priority for the Biden administration on nuclear deterrence as it relates to transatlantic security?” The articles in this roundtable are analyses that colloquium panelists Tobias Bunde, Amy Nelson, Alexander “Sandy” Vershbow, and Kristin Ven Bruusgaard wrote in response to this and other questions prior to the colloquium.

What Is at Stake?

In a pre-workshop survey, we asked expert participants in our workshop to rate the performance of the “Atlantic Charter,” the aspirational set of principles proclaimed by President Franklin D. Roosevelt and Prime Minister Winston Churchill 80 years ago, in

August 1941.¹ Sixty-three percent of those polled believed the trans-Atlantic community was “very successful” or “somewhat successful” at ensuring that there are “no territorial changes that do not accord with the freely expressed wishes of the peoples concerned.” Only 27 percent selected “somewhat unsuccessful” regarding the establishment of “a peace which will afford to all nations the means of dwelling in safety within their own boundaries.” No one believed the trans-Atlantic community was “very unsuccessful” at this task.

Nuclear deterrence may deserve some of the credit for this perceived success. According to many experts, nuclear weapons helped keep the Cold War cold long enough for the standoff between the Soviet Union and its bloc and the trans-Atlantic community, led by the United States, to end without a shot fired.² And yet, nuclear weapons also presented the Cold War’s biggest, most existential risk to humanity — and they continue to do so. As Ven Bruusgaard writes in her contribution to this roundtable, “It remains a fact that nuclear weapons can bring existential destruction to humanity.” It is important not to lose sight of this gruesome fact in the sometimes technical and often esoteric details of nuclear strategy.

There are questions today about the relative importance of nuclear weapons in the NATO context. Some of the authors in this roundtable remind us that the ability of nuclear capabilities to deter conventional war is an underappreciated reality of nuclear weapons, especially in an era of “great-power competition.” Ven Bruusgaard’s essay also argues forcefully that “U.S. nuclear weapons are likely one factor inhibiting even more aggressive Chinese and Russian policies in their respective neighborhoods.”

A related question is whether, when it comes to nuclear weapons, the trans-Atlantic community should “trade known risks for unknown ones,” as Ven Bruusgaard puts it. For all our participants, the answer is a resounding “no,” which Bunde illustrates with a

¹ “The Atlantic Charter,” North Atlantic Treaty Organization, Aug. 14, 1941, https://www.nato.int/cps/en/natohq/official_texts_16912.htm.

² Robert Rauchhaus, “Evaluation the Nuclear Peace Hypothesis: A Quantitative Approach,” *Journal of Conflict Resolution* 53, no. 2 (April 2009): 258–77, <https://doi.org/10.1177%2F0022002708330387>; Kenneth N. Waltz, “Nuclear Myths and Political Realities,” *American Political Science Review* 84, no. 3 (September 1990): 730–45, <https://doi.org/10.2307/1962764>.

metaphor inspired by the late Supreme Court Justice Ruth Bader Ginsburg: We may be in a rainstorm, and we are not getting wet, so we are considering whether we really need our nuclear umbrella. The inability to see the rainstorm while holding our umbrella is frustrating, but our panelists make the case for holding on.

Trans-Atlantic Challenges for Nuclear Deterrence

Questions about the sustainability of the nuclear umbrella have been around almost as long as the NATO alliance. These queries include: Should the U.S. government adopt a “sole purpose” or even a “no-first-use” declaratory policy?³ And, do “tactical” or “non-strategic” nuclear weapons still have a place in the U.S. arsenal?⁴ Our authors focus on these and emerging nuclear challenges for the trans-Atlantic community.

According to the authors, these new challenges don’t just arise from technologies like hypersonics, which Vershbow identifies as potentially overhyped, or from “nuclear entanglement” with the space or cyber domains. They also come from more mundane concerns, including shifting domestic opinions, a geostrategic environment that complicates arms control, and the intricacies of defense innovation and the trans-Atlantic defense trade.⁵

Taking Public Opinion Seriously

The first of these challenges is evolving public opinion about nuclear weapons in NATO states. In recent polls conducted by the Munich Security Conference (where Bunde is director of research and policy), 66 percent of respondents said they believed Germany

³ Ankit Panda and Vipin Narang, “Sole Purpose Is Not No First Use: Nuclear Weapons and Declaratory Policy,” *War on the Rocks*, Feb. 22, 2021, <https://warontherocks.com/2021/02/sole-purpose-is-not-no-first-use-nuclear-weapons-and-declaratory-policy/>.

⁴ On the idea of “tactical” nuclear weapons, see Christian P. Ruhl, “‘It’s Better to Forget Physics’: The Idea of the Tactical Nuclear Weapon in the Early Cold War,” *Physics in Perspective* 22, no. 2 (March 2020): 26–51, <https://doi.org/10.1007/s00016-020-00251-3>.

⁵ On nuclear entanglement, see “Nuclear Entanglement,” Carnegie Endowment for International Peace, accessed Aug. 9, 2021, <https://carnegieendowment.org/programs/npp/nuclear-entanglement>.

should “renounce nuclear deterrence entirely.”⁶ This trans-Atlantic public attitude reflects a global trend. Earlier this year, the Treaty on the Prohibition of Nuclear Weapons (also known as the “Nuclear Ban Treaty”) entered into force with the signature of Honduras.⁷ A 2019 YouGov poll commissioned by the International Campaign to Abolish Nuclear Weapons similarly found that 68 percent of German respondents believed their country should join the treaty.⁸

This is not a new goal. The drafters of the Atlantic Charter singled out disarmament as the final aspirational principle of their declaration: “all of the nations of the world, for realistic as well as spiritual reasons must come to the abandonment of the use of force.” This has been the main failure of the charter. Seventy-two percent of our respondents stated that the trans-Atlantic community has been “very” or “somewhat” unsuccessful at meeting this goal.

No NATO member, however, has signed the Nuclear Ban Treaty. In December 2020, NATO issued a statement that reiterated alliance members’ continued faith in the value of a nuclear deterrent and proclaimed, “As long as nuclear weapons exist, NATO will remain a nuclear alliance.”⁹ Contributions to this roundtable, including that by the former deputy secretary general of NATO, Ambassador Alexander “Sandy” Vershbow, expressed a similar belief.

As Bunde’s contribution makes clear, the gap between NATO policies and NATO publics represents a challenge for the trans-Atlantic relationship and trans-Atlantic strategy. The

⁶ *Zeitenwende Wendezeiten: Special Edition of the Munich Security Report on German Foreign and Security Policy*, Munich Security Conference, October 2020, https://securityconference.org/assets/01_Bilder_Inhalte/03_Medien/02_Publikationen/MSC_Germany_Report_10-2020_Engl.pdf, 127.

⁷ “Treaty on the Prohibition of Nuclear Weapons (TPNW),” Nuclear Threat Initiative, last updated April 16, 2021, <https://www.nti.org/learn/treaties-and-regimes/treaty-on-the-prohibition-of-nuclear-weapons/>.

⁸ “Polls: Public Opinion in EU Host States Firmly Opposes Nuclear Weapons,” International Campaign to Abolish Nuclear Weapons, accessed Aug. 9, 2021, https://www.icanw.org/polls_public_opinion_in_eu_host_states_firmly_opposes_nuclear_weapons.

⁹ “North Atlantic Council Statement as the Treaty on the Prohibition of Nuclear Weapons Enters Into Force,” North Atlantic Treaty Organization, Dec. 15, 2020, https://www.nato.int/cps/en/natohq/news_180087.htm.

horror of nuclear war is a powerful motivating force, and skilled organizing by Nuclear Ban Treaty leaders has influenced public attitudes about nuclear weapons. In Germany, especially, only a small sliver of the public continues to support Germany's participation in the U.S. nuclear umbrella. Of those who did support deterrence, only 24 percent of respondents said Germany should continue to rely on the United States for this deterrence.¹⁰

At the heart of this shifting public opinion, Bunde argues, is the paradox of success. Nuclear weapons no longer seem necessary because the threat against which they protect no longer feels urgent, especially to Central and Western Europeans. As Bunde argues, "extended deterrence has become too successful, undermining its very foundations — the perceived need of protection." Managing the paradox of success, according to Bunde, will be a key challenge for NATO member-state leaders in the years to come. To do this, they will need to engage in good-faith debates with nuclear abolitionists, debates that are at their heart not technical, but moral, and appeal to the same instincts as the proponents of the Nuclear Ban Treaty do.

Creative Arms Control

If Nuclear Ban Treaty-style disarmament is not the future of trans-Atlantic deterrence, however, several panelists argued that arms control remains indispensable. Vershbow writes in his contribution that, "[the Strategic Arms Limitations Talks I and II] and subsequent accords codified mutual deterrence based on the assumption of mutual vulnerability and acceptance of an assured second-strike capability on both sides."

The past few years have generated challenges to Cold War-initiated arms control regimes. Even the February 2021 extension of New START, which extended the verifiable limits on deployed strategic nuclear weapons for five more years, revealed the difficulties of keeping the current arms control regime alive, let alone expanding it. Geopolitical realities have had some prominent practitioners predicting "the end of arms control."¹¹ New thinking about

¹⁰ Munich Security Conference, *Zeitenwende Wendezeiten*, 127.

¹¹ Linton F. Brooks, "The End of Arms Control?" *Daedalus* 149, no. 2 (Spring 2020): 84-100, https://doi.org/10.1162/daed_a_01791.

arms control will potentially be necessary, including nonbinding voluntary agreements, as well as confidence-building measures in other domains, especially areas like AI and cyber, which may feature greater integration with nuclear command, control, and communications infrastructure in the future.

Vershbow identifies one limited but crucial step the United States, its allies, and Russia could take to improve strategic stability. As part of a follow-on to New START, and to partly compensate for the end of the Intermediate-Range Nuclear Forces treaty, the Biden administration could pursue a bilateral effort to ban nuclear-armed intermediate-range missiles, even only regionally, “from the Atlantic to the Urals.” Such an agreement might have benefits beyond those outlined by Vershbow, and could co-opt domestic opinion in NATO member states, avoid greater pushback to new deployments, and potentially redirect the energy behind the Nuclear Ban Treaty movement in countries like Germany.

Beyond Nuclear: Gray-Zone Deterrence and Defense Innovation

Responding to disruption to trans-Atlantic deterrence relationships will require thinking beyond nuclear weapons. For a different take on “transatlantic disruption,” Nelson explains that the trans-Atlantic security relationship goes beyond nuclear, conventional, and gray-zone deterrence, to the innovations, trade relationships, and institutions that make deterrence possible in the first place.

Nelson describes the trans-Atlantic defense trade, or more accurately, U.S. defense exports to Europe, as an underappreciated “backbone” of the trans-Atlantic relationship. Her contribution diagnoses the ailments of this backbone and explains that the European quest for strategic autonomy through the European Defense Fund and Permanent Structured Cooperation on security and defense “disrupts the U.S. model for sustaining its own defense industry — about \$60 billion worth of disruption per year.” This disruption comes as the world is “in the throes of the Fourth Industrial Revolution and a boom time for innovation,” as Nelson writes, which brings the conversation back to technological innovations, including AI, hypersonic missiles, space assets, and more.

Although these technologies, too, threaten the “disruption” of trans-Atlantic deterrence, our authors argued that it is important not to overestimate their impact. The brittleness of algorithms in uncertain situations and the challenges of integration and compatibility mean that the potential applications of AI to the nuclear space remain limited.¹² Fears of a hypersonic “arms race,” too, may be overstated.¹³ Vershbow underscores this point in the U.S.-Russian context, writing, “[intercontinental ballistic missiles] and [submarine-launched ballistic missiles] already reach hypersonic speeds in their ballistic trajectory, and neither side has the technical capacity to defend against a large-scale strategic missile attack using current missile defense technologies.”

Strategy and Policy Recommendations

Before the workshop, which occurred in the midst of the transition between the Trump and Biden administrations, Perry World House asked participants, “How would you characterize the current strength of the transatlantic relationship?” Only 18 percent of respondents at the time believed this relationship to be “strong” or “very strong.” While it is likely that the numbers have changed somewhat over the last several months, what do our authors suggest are paths forward for the trans-Atlantic relationship in the context of deterrence and strategic stability?

First, some believe trans-Atlantic leaders should engage seriously with nuclear abolitionists and publicly engage in real debate about the costs and risks of nuclear weapons. As Bunde writes, “Those in the strategic community who still believe that nuclear deterrence remains indispensable will have to make the case for it and be ready to engage in moral and ethical discussions.” Trying to ignore the Nuclear Ban Treaty may or may not be strategic, but trying to ignore the domestic sentiments behind it is irresponsible. The anti-nuclear Green Party is the second most popular party in the polls for Germany’s September elections, and although an end to nuclear sharing in one of the most important NATO countries may seem

¹² “Policy Roundtable: Artificial Intelligence and International Security,” *Texas National Security Review*, June 2, 2020, <https://tnsr.org/roundtable/policy-roundtable-artificial-intelligence-and-international-security/>.

¹³ Andrew W. Reddie, “Hypersonic Missiles: Why the New ‘Arms Race’ Is Going Nowhere Fast,” *Bulletin of the Atomic Scientists*, Jan. 13, 2020, <https://thebulletin.org/2020/01/hypersonic-missiles-new-arms-race-going-nowhere-fast/>.

unlikely, in the words of the party's own slogan, *Alles ist möglich* — everything is possible.¹⁴ A widespread public communications debate that takes criticisms about the huge risks of nuclear deterrence seriously is necessary for NATO and its member states. Recent NATO explainers on the alliance's nuclear policy are a good step in this direction.¹⁵

Second, and relatedly, new and creative approaches to arms control are worth exploring, according to the authors. During the discussions of the workshop (which were held under the Chatham House Rule), many suggested it was time to reimagine arms control both in practice and perception. This could include new processes such as nonbinding voluntary norms, pursuing creative cross-pollination of issues in other multinational arms control fora, and tackling new challenges raised by some emerging technologies. As Vershbow argues, a new approach could include an “Atlantic to Urals” Intermediate-Range Nuclear Forces treaty follow-on to START. If rethinking arms control is a substantive win for all of humanity because it increases stability and transparency, rebranding will provide a crucial political win for NATO member-state leaders with anti-nuclear constituencies, showing that NATO cares about arms races, instability, and related risks from nuclear weapons.

Finally, to preserve nuclear deterrence, the trans-Atlantic alliance needs to consider the interrelated character of the deterrence debate and other issues, such as how the dynamics of the defense trade impact defense innovation. Discussions at the workshop focused in part on deterrence in the cyber domain, as well as gray-zone deterrence — deterring threats that do not meet the threshold of war, like economic coercion and election interference. Further scholarship is needed on how these issues are entangled with nuclear deterrence, and how they impact the future of the trans-Atlantic alliance. The “quietly contentious” issue of the defense trade raised by Nelson, finally, needs more attention, lest it become louder, more contentious, and thus more disruptive.

¹⁴ “Poll of Polls: Germany 2021 General Election,” *Politico*, accessed Aug. 9, 2021, <https://www.politico.eu/europe-poll-of-polls/germany/>.

¹⁵ Jessica Cox, “How Does NATO Respond to the Threat of Nuclear Weapons,” North Atlantic Treaty Organization, April 28, 2021, https://www.nato.int/cps/en/natohq/news_183208.htm.

Conclusion

As long as there are trans-Atlantic security challenges, our authors believe that NATO will continue to be a cornerstone of trans-Atlantic relations. Moreover, these authors also think that the risks of nuclear war will mean the trans-Atlantic nuclear umbrella remains important to preserving stability. For that reason, it is no surprise that when we asked participants in the Perry World House workshop whether they thought intensifying “great-power competition” would detract from or improve the trans-Atlantic relationship, more participants said it would not disrupt but improve the relationship. A common threat, it seems, might bring the trans-Atlantic allies closer together once again.

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2. The Risks of an Incremental German Exit from NATO's Nuclear Sharing Arrangement

By Tobias Bunde

Nuclear weapons have made a return to the top of the agenda of world politics. All major nuclear powers have begun to invest in new capabilities or to modernize their arsenals. At the same time, attempts to curb nuclear proliferation have had, at best, a limited effect, while new technologies may undermine the assumptions on which traditional nuclear strategies have been based. With old rules eroding and new challenges emerging, a “second nuclear age,” marked by more actors and likely less stability, is taking shape.

Nevertheless, critics of nuclear deterrence are gaining ground in Western societies. The abolitionist movement, spearheaded by the International Campaign to Abolish Nuclear Weapons, has stressed the humanitarian and environmental consequences of nuclear weapon use and has attempted to outlaw nuclear weapons. On Jan. 22, 2021, the Treaty on the Prohibition of Nuclear entered into force.¹⁶ It is unclear what its consequences will be, as all existing nuclear-weapon states have rejected the treaty and most of the 50 participants are smaller countries. However, the treaty has already changed the debate in Western societies, particularly in Europe.¹⁷ What the late Michael Howard described in the early 1980s has become an even greater challenge today. The fact that engaging in deterrence is now seen by many as more dangerous than deterrence failure may result, as Howard wrote almost 40 years ago, from

the degree to which we Europeans have abandoned the primary responsibility for our defense to the United States; have come to take the deterrence provided by

¹⁶ See Dan Sabbagh, “Global Nuclear Weapons Ban Begins - Without the World's Nuclear Powers,” *The Guardian*, Jan. 21, 2021, <https://www.theguardian.com/world/2021/jan/21/global-nuclear-weapons-ban-begins-without-the-worlds-nuclear-powers>.

¹⁷ See Heather Williams, “What the Nuclear Ban Treaty Means for America's Allies,” *War on the Rocks*, Nov. 5, 2020, <https://warontherocks.com/2020/11/what-the-nuclear-ban-treaty-means-for-americas-allies/>.

others for granted; and now assume that the dangers against which we once demanded reassurance only now exist in the fevered imagination of our protectors.¹⁸

In other words, extended deterrence has become too successful, undermining its very foundations — the perceived need of protection.

Together, this twin challenge puts NATO leaders in a tough spot. They not only have to respond to new nuclear challenges posed by adversaries, but they need to deal with domestic constituencies that are skeptical of nuclear deterrence. While it was far from easy to shore up domestic support for nuclear deterrence during the Cold War, as the Euromissiles crisis in the early 1980s demonstrated, it will likely be even more difficult to do so today. The transatlantic alliance is more heterogeneous than in the past, with some allies promoting a strengthening of NATO's nuclear posture and others flirting with supporters of the Treaty on the Prohibition of Nuclear Weapons. The ongoing debate about the future of NATO's nuclear sharing arrangement suggests that NATO policy rests on shakier grounds than often assumed. There is thus a real risk of a new nuclear crisis that could severely hamper NATO's ability to deter or even endanger the long-term health of the alliance.

Unfortunately, NATO leaders are woefully unprepared for such a crisis. For a long time, many of them have preferred not to talk too much about nuclear deterrence. Apart from the general nod to the existence of nuclear weapons and NATO's self-understanding as a "nuclear alliance" in official documents or summit declarations, nuclear weapons have hardly been discussed publicly. For many, nuclear deterrence seemed to be a relic of the Cold War. And those who believed it was important not to scrap it often preferred not to discuss it, thinking it would be better to let sleeping dogs lie. The deterioration of NATO's security environment, as well as the rise of the abolitionist movement in Western societies, have arguably made this strategy unsustainable.

¹⁸ Michael Howard, "Reassurance and Deterrence: Western Defense in the 1980s," *Foreign Affairs* 61, no. 2 (Winter 1982): 319, <https://doi.org/10.2307/20041437>.

Officially, of course, NATO member-states have repeatedly underlined their commitment to nuclear deterrence.¹⁹ Most allies hosting U.S. non-strategic nuclear weapons have decided to invest in new dual-capable aircraft. Yet, both public opinion and significant portions of the elites in several NATO member-states have become skeptical of NATO's reliance on nuclear deterrence. According to a 2019 survey for the International Campaign to Abolish Nuclear Weapons, public opinion in the four E.U. states that host U.S. nuclear weapons tends to support the removal of these weapons and is highly critical of the idea of equipping new fighter jets with a nuclear capacity.²⁰

The Risks of a German Exit

This view is particularly pronounced in Germany. A 2020 public opinion poll for the Munich Security Conference found that two-thirds (66 percent) of Germans supported the position that Germany should completely abandon nuclear deterrence.²¹ While the German government's 2016 white paper on security policy — the *Weißbuch*, which is similar to America's national security strategy —

¹⁹ In mid-December of last year, the North Atlantic Council reiterated the position of the Alliance: "NATO is a defensive Alliance. The fundamental purpose of NATO's nuclear capability is to preserve peace, prevent coercion, and deter aggression. A world where the states that challenge the international rules-based order have nuclear weapons, but NATO does not, is not a safer world. As long as nuclear weapons exist, NATO will remain a nuclear alliance." See "North Atlantic Council Statement as the Treaty on the Prohibition of Nuclear Weapons Enters Into Force," North Atlantic Treaty Organization, Press Release, Dec. 15, 2020, 131, https://www.nato.int/cps/en/natohq/news_180087.htm.

²⁰ See "Polls: Public Opinion in EU Host States Firmly Opposes Nuclear Weapons," International Campaign to Abolish Nuclear Weapons, accessed Aug. 16, 2021, <https://www.icanw.org/campaign-news/polls-public-opinion-in-eu-host-states-firmly-opposes-nuclear-weapons/>.

²¹ Tobias Bunde et al., "Zeitenwende/Wendezeiten: Special Edition of the Munich Security Report on German Foreign and Security Policy," Munich Security Conference, 2021, 130, <https://doi.org/10.47342/SBID8214>. Of the 31 percent who supported nuclear deterrence, only about a quarter said Germany should continue to rely on nuclear deterrence via the United States, whereas 59 percent of them said the country should strive for nuclear deterrence via France and the United Kingdom. For a new and detailed assessment of German views on nuclear weapons, see Michal Onderco and Michal Smetana, "German Views on Nuclear Weapons in Europe: Public and Elite Perspectives," *European Security*, online first, <https://doi.org/10.1080/09662839.2021.1941896>.

stresses the continued necessity of nuclear deterrence as long as nuclear weapons exist, it maintains that “the strategic nuclear capabilities of NATO, and in particular those of the United States, are the ultimate guarantee of the security of its members,” and underlines that “Germany continues to be an integral part of NATO’s nuclear policy and planning” through nuclear sharing,²² several prominent politicians have recently questioned the acquisition of new dual-capable aircraft needed to replace the aging Tornados.²³

The junior partner in the current coalition, the Social Democratic Party, has repeatedly delayed a decision on a Tornado replacement, leading German Defence Minister Annegret Kramp-Karrenbauer to announce her plan to buy American F-18s without being sure whether the Bundestag would support it.²⁴ The Green Party, which has surpassed the Social Democrats in the polls, has its roots in the peace movement and calls for “a Germany free of nuclear weapons” and “a broad public debate about outdated deterrence doctrines of the Cold War” in its most recent party manifesto (although influential parts of the party argue for some flexibility).²⁵ As a parliamentary majority without the Greens or the Social Democrats is highly unlikely, this issue will almost certainly be a stumbling block in coalition negotiations after the elections for the Bundestag in September 2021.

²² “White Paper 2016 on German Security Policy and the Future of the Bundeswehr,” Germany’s Federal Ministry of Defence, 2016, 65,

<https://www.bundeswehr.de/resource/blob/4800140/fe103a80d8576b2cd7a135a5a8a86dde/download-white-paper-2016-data.pdf>.

²³ For an overview of the German debate, see Pia Fuhrhop, “The German Debate: The Bundestag and Nuclear Deterrence,” in *Europe’s Evolving Deterrence Discourse*, ed. Amelia Morgan and Anna Péczeli (Livermore: Lawrence Livermore National Laboratory), 27–38.

²⁴ See Sebastian Sprenger, “German Government Cites US Ties in Choice of F-18 Planes for Nuclear, Jamming Missions,” *Defense News*, April 22, 2020, <https://www.defensenews.com/global/europe/2020/04/22/german-government-cites-us-ties-in-choice-of-f-18-planes-for-nuclear-jamming-missions/>.

²⁵ “Deutschland. Alles ist drin. Bundestagswahlprogramm 2021,” Bündnis 90/Die Grünen, accessed Aug. 16, 2021, 249–50, <https://www.gruene.de/artikel/wahlprogramm-zur-bundestagswahl-2021>, author’s translation. Yet, the party manifesto also stresses: “We know that - also in view of Russia’s conventional and nuclear armament - this will require numerous talks within the Alliance, including with our European partners, and above all the strengthening of the security and reassurance of our Polish and Baltic Allies” (author’s translation). For quote, see page 250.

Proponents of a withdrawal of U.S. non-strategic nuclear weapons from German soil argue that it would make Germany and Europe more secure and downplay the potential risks of such a decision.²⁶ For them, Berlin's refusal to continually host U.S. nuclear weapons and invest in the next generation of dual-capable aircraft would neither mean the end of nuclear sharing nor undermine NATO cohesion. They often try to distinguish between the so-called technical and political elements of nuclear sharing, arguing that ending the former would not necessarily affect the latter. Pointing to states such as Canada or Greece that once hosted U.S. nuclear weapons but got rid of them a long time ago and still participate in NATO's Nuclear Planning Group, they argue that Germany would still be able to influence NATO nuclear strategy, that the United States would still be willing to protect NATO, and that NATO and the nuclear sharing arrangement as such would continue to exist and function well.

These arguments are based on rather heroic assumptions. First, they assume that it does not matter what you bring to the table. According to Rolf Mützenich, chairman of the Social Democrats in the Bundestag, a withdrawal of non-strategic nuclear weapons from Germany “would not result in the end of the American nuclear guarantee nor of Germany's say in nuclear matters ... as it would still be guaranteed through its membership in the Nuclear Planning Group.”²⁷ Yet, it would be very surprising if those states that actively contributed to NATO's nuclear sharing mission didn't have more influence than other member-states. After all, it is well known that those NATO members that provide troops to allied operations (in particular those that carry special risks) have more influence on NATO strategy for a given operation than other member-states.

Second, they implicitly or explicitly argue that it would not make much of a difference for the security provider, the United States, whether their *protégés* participate in the arrangement or not. After all, they argue, the United States does not need the few non-strategic nuclear weapons on European soil to provide effective deterrence for the whole of NATO. According to the critics, these weapons are militarily useless, because there is no

²⁶ See Rolf Mützenich, “Germany and Nuclear Sharing,” *International Politics and Society*, May 15, 2020, <https://www.ips-journal.eu/topics/foreign-and-security-policy/germany-and-nuclear-sharing-4362/>. See also the overview provided by Fuhrhop, “The German Debate.”

²⁷ Mützenich, “Germany and Nuclear Sharing.”

realistic scenario for their use.²⁸ Yet, many military experts disagree. They maintain that even the current generation of jet fighters could successfully carry out their mission. Moreover, from this perspective, jet fighters carrying gravity bombs provide a lot of operational flexibility and are valuable tools for strategic communication.²⁹

It could also be argued that these non-strategic nuclear weapons never really had much military use in a narrow sense. Rather, they have always been political symbols, linking European security to American security. It is important to recognize, though, that “symbolic” does not mean politically unimportant. In contrast, nuclear sharing has also meant reassurance and risk sharing. However, as former U.S. ambassador to NATO, Ivo Daalder, notes, reassurance works both ways: “it’s a two-way street.”³⁰ For the United States, it will thus make a huge political difference whether U.S. allies are willing to continue to share the risks associated with the nuclear umbrella. In an article for *Der Spiegel*, two experienced Europe hands, former Deputy Secretary of Defense Michèle Flournoy and former Deputy Assistant Secretary of Defense for Policy Jim Townsend, warned in no uncertain terms that “Germany walking away from this vow to share the nuclear burden, this expression of solidarity and risk sharing, strikes at the heart of the trans-Atlantic bargain.”³¹

²⁸ See, for example, Moritz Kütt, “Kernwaffen in Deutschland. Hintergründe zur nuklearen Teilhabe. Studie im Auftrag von Greenpeace,” Greenpeace, 2020, https://www.greenpeace.de/sites/www.greenpeace.de/files/publications/so3061_gp_nukleare_teilhabe_studie_10_2020_fly_05.pdf; Von Sascha Hach, “Nukleare Kriegsgefahr: Deutschland auf dem Opferaltar,” Frankfurter Rundschau, Aug. 16, 2021, <https://www.fr.de/meinung/gastbeitraege/nukleare-kriegsgefahr-deutschland-opferaltar-13823705.html>; and Pia Fuhrhop, Ulrich Kühn, and Oliver Meier, “Welchen Sinn haben deutsche Atombomber?” *Der Spiegel*, April, 30, 2020, <https://www.spiegel.de/politik/deutschland/f-18-welchen-sinn-haben-deutsche-atombomber-a-63ccf36e-afb6-499e-97bc-c33bc9360ec6>.

²⁹ Author interviews with military experts between July 2020 and May 2021. Some experts pointed out that jet fighters, in contrast to missiles, for instance, could even be recalled.

³⁰ Ivo Daalder, “Preventing Nuclear Proliferation and Reassuring America’s Allies,” Remarks at a Digital Event at the Hertie School,” May 11, 2021, <https://www.hertie-school.org/en/news/allcontent/detail/content/preventing-nuclear-proliferation-and-reassuring-americas-allies>.

³¹ Michèle Flournoy and Jim Townsend, “Striking at the Heart of the Trans-Atlantic Bargain,” *Der Spiegel*, June 3, 2020, <https://www.spiegel.de/international/world/biden-advisers-on-nuclear-sharing-striking-at-the-heart-of-the-trans-atlantic-bargain-a-e6d96a48-68ef-49ab-8a0c-8a979abf2bb4>.

Third, the German proponents of a withdrawal of U.S. nuclear weapons underestimate the role of their own country. Germany, after all, is not just another member-state. To begin with, the country's role in NATO was a major reason for the very creation of this special arrangement.³² Its departure from NATO's technical nuclear sharing arrangement would very likely trigger other "exits" and lead to transatlantic disruption. While the nuclear sharing arrangement may survive a Belgian or Dutch exit, it is hard to imagine that a German withdrawal would not bring about a general crisis of nuclear sharing. According to Flournoy and Townsend, "the bargain sustaining U.S. extended nuclear deterrence to Europe would collapse and the U.S. umbrella would essentially be decoupled from Europe."³³ At a time of upheaval for the transatlantic alliance and ongoing discussions about a potential "decoupling," this promises to be a dangerous strategy with potentially far-reaching consequences.³⁴

The Road Ahead: How Can We Avoid Transatlantic Nuclear Disruption?

As the past few years have shown, a reactive communication strategy that tries to protect a very fragile elite consensus without rocking the boat is apparently not enough. Those in the strategic community who still believe that nuclear deterrence remains indispensable will have to make the case for it and be ready to engage in moral and ethical discussions. They should not be afraid of a debate with those who think that unilateral disarmament is the safer strategy. After all, the case can be made that supporting NATO cohesion and limited nuclear deterrence is the more promising path toward risk reduction, disarmament, and peaceful relations in the long run.

Most importantly, they need to be clear in communicating the risks of a unilateral end to nuclear sharing. They should also highlight the meager benefits of unilateral disarmament

³² See Timothy Sayle, *Enduring Alliance. A History of NATO and the Postwar Global Order* (Ithaca, NY: Cornell University Press, 2019), chap. 5.

³³ Flournoy and Townsend, "Striking at the Heart of the Trans-Atlantic Bargain."

³⁴ See Tobias Bunde, "The Future of the West: What If the United States Pulls Out of NATO?" in *War Time: Temporality and the Decline of Western Military Power*, ed. Sten Rynning, Olivier Schmitt, and Amelie Theussen (Washington, DC: Brookings Institution Press, 2021), 85–106.

when other states are investing in new nuclear capabilities and doctrinal developments. In particular, Berlin's allies need to pay attention to the German debate and stress the potential damage of Germany pushing for the withdrawal of U.S. non-strategic weapons. Germans may be less receptive to arguments about nuclear strategy, but they may listen to warnings that the end of nuclear sharing would present a major threat to multilateralism and could pave the way for a renationalization of security policy.

At the same time, proponents of NATO's nuclear sharing arrangement will also have to make clear that they take seriously the valid points made by those concerned with the very real risks that come with nuclear weapons. For large parts of the Western public, it is far from self-evident today that relying on nuclear deterrence is indeed the best strategy to deal with a deteriorating security environment. Consequently, NATO leaders should engage with critics' concerns that the alliance is just sticking with a dangerous relic from the Cold War because it does not know what else to do. They should also be open to thinking through potential alternatives to the current arrangement (which dates back to the 1960s) that would be able to fulfill the same role, i.e., serving as a link between U.S. and European security. And they need to find ways to combine efforts to maintain a necessary level of deterrence with a sincere commitment to nuclear risk reduction, arms control, and disarmament.

For instance, NATO leaders should be open to discussing proposals such as a five-year moratorium, during which neither Russia nor NATO would deploy new "destabilizing weapons to Europe until 2025," giving NATO time to reassess the nuclear status quo and test Russia's willingness to seriously consider mutual arms reductions.³⁵ Likewise, following in the footsteps of NATO's traditional dual-track strategy,³⁶ they should also be open to adapting their capabilities if the security environment continues to erode further.

³⁵ See Pia Fuhrhop, Ulrich Kühn, and Oliver Meier, "Creating an Opportunity to Withdraw U.S. Nuclear Weapons From Europe," *Arms Control Today* 50, no. 8 (October 2020): 18–22, <https://www.armscontrol.org/act/2020-10/features/creating-opportunity-withdraw-us-nuclear-weapons-europe>.

³⁶ For a discussion of various "dual-track strategies" in the post-INF era, see John D. Maurer, "The Dual-Track Approach: A Long-Term Strategy for a Post-INF Treaty World," *War on the Rocks*, April 10, 2019, <https://warontherocks.com/2019/04/the-dual-track-approach-a-long-term-strategy-for-a-post-inf-treaty-world/>.

Germany, in any case, would do well to discuss the difficult questions relating to the future of nuclear security within NATO, instead of incrementally phasing out its participation in the nuclear sharing arrangement.³⁷

After all, without NATO cohesion, neither deterrence nor security will be achieved. Alliance management and balancing different assurance and deterrence needs within NATO will be major challenges for the coming years. Given the very heterogeneous threat perceptions and policy preferences within the alliance, discussions on the nuclear components of NATO's next strategic concept and on a potential update of the *Deterrence and Defense Posture Review* of 2012 will be difficult.³⁸

For a complete denial of deterrence, however, the transatlantic alliance will very likely be punished. A metaphor the late Justice Ruth Bader Ginsburg once used in a completely different case may also apply to the nuclear umbrella: "throwing out [something] when it has worked and is continuing to work ... is like throwing away your umbrella in a rainstorm because you are not getting wet."³⁹

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³⁷ This is the far more realistic scenario than a unilateral decision. The next German government might postpone a decision to buy a successor to the Tornado, extending the lifetime of the dual-capable aircraft even further, thus raising the costs and limiting their readiness. Germany's participation in the nuclear sharing arrangement may thus just peter out.

³⁸ Both key documents stem from the pre-2014 period. See "Active Engagement, Modern Defence Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organisation adopted by Heads of State and Government in Lisbon," North Atlantic Treaty Organization, Nov. 19, 2010, https://www.nato.int/cps/en/natohq/official_texts_68580.htm; and "Deterrence and Defense Posture Review," North Atlantic Treaty Organization, Press Release, May 20, 2020, 63, https://www.nato.int/cps/en/natohq/official_texts_87597.htm.

³⁹ Cited in Ellen D. Katz, "Justice Ginsburg's Umbrella," in *A Nation of Widening Opportunities? The Civil Rights Act at Fifty*, ed. S. R. Bagenstos and E. D. Katz (Ann Arbor, MI: Michigan Publishing, 2015), 264.

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3. The Cost of Uncertainty: European Strategic Autonomy and U.S.- E.U. Relations

By Amy J. Nelson

Arguably, the most quietly contentious issue confronting the transatlantic relationship today is that of defense innovation and Europe’s inward turn in pursuit of its own strategic autonomy. The defense trade, namely U.S. defense exports to Europe, has served as the backbone of the relationship since the Cold War. With the European Union’s recent launch of new initiatives to produce novel technologies and systems made in Europe by Europeans using European technology and know-how, the United States, with a sizeable amount of defense exports to the region, now stands to lose out.

Years in the Making

This crisis is a number of years in the making. In 2017, the European Union announced the establishment of the European Defence Fund, a coordinating body designed to manage

national investments in defense research while improving interoperability among European national armed forces.⁴⁰ That same year, it announced the launch of a treaty-based initiative called the Permanent Structured Cooperation on security and defense,⁴¹ in which 25 E.U. member-states agreed to common commitments in the areas of defense investment, capability development, and operational readiness. At the time, 17 Permanent Structured Cooperation projects were listed for joint development and implementation, with technologies and systems that initially ranged from a network of logistics hubs to platforms and teams for countering cyber security threats. In 2018, the European Council adopted an additional 17 projects that included an armored infantry fighting/amphibious assault vehicle, as well as land- and sea-based autonomous systems.⁴²

Initially, Permanent Structured Cooperation and the European Defence Fund were met with little reaction or fanfare from the other side of the Atlantic. It wasn't until the 2018 Munich Security Conference that U.S. Ambassador to NATO Kay Bailey Hutchinson spoke out, asking that Europe, essentially, slow down and stave off the urge to exclude U.S. defense firms from European projects: "Certainly, we do not want this to be a protectionist vehicle for the E.U. And we're going to watch carefully because if that becomes the case, then it could splinter the strong security alliance that we have."⁴³

A letter from the U.S. undersecretary of defense for acquisition and sustainment and the undersecretary of state for arms control and international security affairs followed in 2019, condemning the European Union making decisions on defense innovation without

⁴⁰ Claudia Major, "The Role of Capabilities in the Transatlantic Defense Relationship," Carnegie Europe, accessed Aug. 19, 2021, <https://carnegieeurope.eu/2019/10/30/role-of-capabilities-in-transatlantic-defense-relationship-pub-80221>.

⁴¹ "Council Decision Establishing Permanent Structured Cooperation (PESCO) and Determining the List of Participating Member States," Council of the European Union, Dec. 8, 2017, <https://www.consilium.europa.eu/media/32000/st14866en17.pdf>.

⁴² "Defence Cooperation: Council Launches 17 New PESCO Projects," Council of the European Union, Nov. 19, 2018, <https://www.consilium.europa.eu/en/press/press-releases/2018/11/19/defence-cooperation-council-launches-17-new-pesco-projects/>.

⁴³ Aaron Mehta, "US Warns Against 'Protectionism' with New EU Defense Agreement," *Defense News*, Feb. 14, 2018, <https://www.defensenews.com/smr/munich-security-forum/2018/02/14/us-warns-against-protectionism-with-new-eu-defense-agreement/>.

consulting the United States and lamenting lost opportunities for the U.S. defense industry to partake in the development of new European weapons and systems.⁴⁴

Europe's clarifying response, deployed from multiple mouthpieces via multiple fora, remained steadfast and consistent. First, Europe is responding to U.S. demands that it increase defense spending to meet the NATO requirement that every member state spend 2 percent of its GDP on defense, ensuring equitable burden sharing.⁴⁵ As such, Europe is simply heeding this call to play a more active role in its own defense. Second, Europe is developing new technologies and systems in order to achieve its own "strategic autonomy," which includes participation in NATO operations (NATO sustainment) and conducting peacekeeping operations — not establishing a European army. Third, European defense innovation is focused on shoring up gaps in capabilities.⁴⁶

Rejecting "U.S. Protectionism"

Whether the European Commission was obligated to consult with the United States on its plans for the European procurement of novel capabilities for Europeans throughout Europe is certainly debatable. However, at the heart of the U.S. response, and the proximal cause of U.S. consternation, may be the "ITAR-free procurement" requirement that is attached to new E.U. projects. The U.S. International Traffic in Arms Regulations, or ITAR, prohibits the export of U.S. materiel, technical data, and training without a license from the U.S. government. Even if non-European states were permitted to bid on Permanent Structured Cooperation projects, potential U.S. involvement is made trickier as a function of these regulations: Were Europe to partner with the United States to buy, co-develop, or co-produce any capabilities, those capabilities would be bound by the U.S. regulations,

⁴⁴ Theresa Hitchens, "State, DoD Letter Warns European Union to Open Defense Contracts, Or Else," *Breaking Defense*, May 17, 2019, <https://breakingdefense.com/2019/05/state-dod-letter-warns-european-union-to-open-defense-contracts-or-else/>.

⁴⁵ Judy Dempsey, "The Three Unresolved Issues of NATO," *Carnegie Europe*, Dec. 5, 2019, <https://carnegieeurope.eu/strategieurope/80503>.

⁴⁶ "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Launching the European Defence Fund," European Commission, 2017, <https://ec.europa.eu/docsroom/documents/23605/attachments/2/translations/en/renditions/native>.

meaning they would be owned by the United States, effectively denying Europe the benefit of selling these capabilities to other end users. The European Commission and European Defence Fund face no such obstacles with the United States excluded from bidding on and participating in Permanent Structured Cooperation projects.

It is the possibility of this “U.S. protectionism” at Europe’s expense that Europe is rejecting. For the European Union, the International Traffic in Arms Regulations has long represented an unfair U.S. advantage. Further, such protectionism is historically anomalous to European countries, for which procurement is decidedly and comparatively open, by contrast. Moreover, as far as the European Union is concerned, the United States’ 1933 Buy American Act, which requires the U.S. government to favor American-made products in considering purchases, stands as further evidence of U.S. hypocrisy. Meanwhile, the European Union has consistently bought tens of billions of dollars more from the U.S. defense industry annually than the United States has from the European one.⁴⁷ Much of what the United States does buy from Europe is the product of cooperative agreements between American and European defense firms, in which U.S. and European firms serve as manufacturing partners. The United States effectively handpicks these European partner firms from companies already based in the United States — where the product or resulting technologies must remain. There is a “workaround” for this: The United States may issue an exemption called a Reciprocal Defense Procurement Memoranda of Understanding. However, U.S. issuance of these waivers has decreased steadily since 2008.⁴⁸

For the United States, Europe’s new defense initiatives serve as a proverbial “slap in the face” to a country that began exporting its own weapons and systems to its European allies at the height of the Cold War.⁴⁹ At the time, this was considered a more magnanimous action than it appears today — the United States had previously not shared its defense

⁴⁷ Daniel Fiott, “The Poison Pill: EU Defence on US Terms?” European Union Institute for Security Studies, Brief No. 7, June 2019, https://www.iss.europa.eu/sites/default/files/EUISSFiles/7_US-EU_defence_industries.pdf.

⁴⁸ “DoD Purchases from Foreign Entities (FY 2004 – FY 2019,” Department of Defense, accessed Aug. 6, 2021, https://www.acq.osd.mil/dpap/cpic/ic/DoD_purchases_from_foreign_entities.html.

⁴⁹ *Arming Our Allies: Cooperation and Competition in Defense Technology*, U.S. Congress, Office of Technology Assessment, May 1990, <https://ota.fas.org/reports/9005.pdf>.

technology with any country. Eventually, this “sharing model” would expand to include non-NATO partner countries and evolve to include co-production and co-development partnership agreements. Today, of course, the U.S. model of defense innovation, which relies heavily on the private sector, requires the export of U.S. weapons and systems to buyers abroad to remain profitable. And only with these profits can the industry then fund next generation research and development.

In light of this history, the situation facing the United States now — losing out on defense dollars while the ability to develop and manufacture capabilities becomes increasingly widespread — is all but unthinkable. Certainly, it disrupts the U.S. model for sustaining its own defense industry — about \$60 billion worth of disruption per year.

Early Indicators

Despite what may appear to be a sudden shift in Europe’s defense innovation model, numerous trend lines portended these events. First, much like the United States, Europe is also restructuring its bureaucracy around defense innovation. The United States recently created several new initiatives and restructured existing Defense Department offices, separating acquisitions from research functions in order to pursue military advantage through leveraging potentially offsetting capabilities from emerging technologies.⁵⁰ Europe, meanwhile, has restructured its bureaucracy and is currently launching new initiatives to sustain NATO, protect its borders, and conduct operations, such as its Common Security and Defence Policy operation in Mali.⁵¹ Second, much like the U.S. Defense Innovation Unit, Europe is leveraging the innovation coming from countries like Germany, which continues to cultivate a strong industrial and innovative intellectual base in engineering to augment

⁵⁰ The National Defense Authorization Act for Fiscal Year 2017 removed the position of USD(AT&L) and, in its place, it created the position of USD(R&E) once again, as well as the new position of USD(A&S). These changes took effect on Feb. 1, 2018. As part of the reorganization, the assistant secretary of defense for logistics and materiel readiness (ASD(L&MR)) and assistant secretary of defense for energy, installations, and environment (ASD(EI&E)) positions were combined into a new assistant secretary of defense for sustainment.

⁵¹ Mette Eilstrup-Sangiovanni, “The EU’s Common Security and Defense Policy and the Mali Crisis,” *E-International Relations*, Aug. 16, 2013, <https://www.e-ir.info/2013/08/16/the-eus-common-security-and-defense-policy-and-the-mali-crisis/>.

its export-driven economy with expertise in such technologies as additive manufacturing, semiconductor design and manufacturing, and robotics.

Moreover, the broader context out of which the recent turn of events emerged also reveals an imminent and perhaps necessary shift. We are currently in the throes of a Fourth Industrial Revolution and a boom time for innovation.⁵² Historically, there has always been an accompanying shift in relationships, hard power, economic power, and general advantage that grows out of boom times like these. The invention of the atomic bomb, the printing press, the steam engine, and the internet all facilitated either a democratization of something (e.g., access, travel, information) or the accretion of power by previously less powerful populations. Indeed, changes — such as major shifts in economic and innovation models — ought to be expected now. In failing to anticipate such shifts, the United States may have inadvertently forfeited the opportunity to preemptively engage with its European allies to dynamically reshape European economic and innovation models in a more collaborative and mutually beneficial way.

Because of this, the United States faces much uncertainty, not merely about where this shift came from, but also about where it is likely to go. For one, it is unclear whether the scope of Europe's defense aspirations might extend beyond what Daniel Fiott calls “strategic autonomy as responsibility.”⁵³ To date, “strategic autonomy as responsibility” has consistently referred purely to the European Union's Common Security and Defense Policy objectives. But, over time, strategic autonomy could easily come to refer to European hedging against the probability that the United States is no longer a reliable partner. In the long run, Fiott explains, things might even cross over into “strategic autonomy as emancipation,” wherein the European Union no longer relies on U.S. defense cooperation and assistance at all — a free Europe.

⁵² Klaus Schwab, “The Fourth Industrial Revolution: What It Means, How to Respond,” World Economic Forum, Jan. 14, 2016, <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>.

⁵³ Daniel Fiott, “Strategic Autonomy: Towards ‘European Sovereignty’ in Defence?” European Union, Institute for Security Studies, Nov. 30, 2018, 8.

This is the backdrop — wrought with withering dialog and rife with uncertainty — against which the transatlantic relationship now finds itself. Not only was this tension, and the events that precipitated it, years in the making, they were foreseeable to a certain extent. In the immortal words of the Greek philosopher Heraclitus: “The only constant is change.” Only by accepting that national models of innovation necessarily evolve, that innovation fosters change, and that the defense trade follows these trend lines can the United States effectively strategize for the road ahead and partner with its allies to ensure a robust and fully capable NATO.

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4. Reflections on NATO Deterrence in the 21st Century

By Ambassador Alexander Vershbow

In the final decades of the Cold War, the United States and Soviet Union were able to stabilize the strategic nuclear competition through arms control, beginning with the agreements reached in the first Strategic Arms Limitation Talks (SALT I) in 1972, the SALT I Interim Agreement on strategic offensive arms, and the Anti-Ballistic Missile Treaty. Those agreements and subsequent accords codified mutual deterrence based on the assumption of mutual vulnerability and acceptance of an assured second-strike capability on both sides. Deterrence worked because both sides recognized that the costs of any aggression — conventional or nuclear — would vastly outweigh any potential gain and ran the risk of nuclear devastation.

Like today, there were concerns at the time about the potentially destabilizing impact of new weapons technologies, such as multiple independently targetable reentry vehicles on intercontinental ballistic missiles (ICBMs), which experts feared could make it easier to carry out a disarming first strike. Another controversial new system was the long-range cruise missile, which seemed to blur the distinctions between conventional and nuclear and strategic and non-strategic weapons, and whose numbers and characteristics were difficult to verify with reconnaissance satellites and other “national technical means.”⁵⁴

Despite these technical challenges, Washington and Moscow were able to keep their global strategic competition within limits. Maintaining the confidence of America’s NATO allies in deterrence was a more complex challenge. In those days, the conventional forces that the United States and other allies maintained along the inner-German border, while substantial in number, were not seen as sufficient to stop an attack by the even larger Soviet and Warsaw Pact forces. The alliance felt it had no choice but to rely on U.S. strategic nuclear weapons as the ultimate deterrent against Soviet aggression. This was underpinned by the stationing of thousands of U.S. tactical nuclear weapons in Europe and the doctrine of

⁵⁴ Alexander R. Vershbow, “The Cruise Missile: The End of Arms Control?” *Foreign Affairs* 55, no. 1 (October 1976), <https://www.foreignaffairs.com/articles/united-states/1976-10-01/cruise-missile-end-arms-control>.

flexible response, adopted in 1967 in place of massive retaliation.⁵⁵ Flexible response aimed to convince Moscow that the United States had a wide range of options along the escalation ladder, short of an all-out strategic nuclear strike, to defeat any form of Soviet aggression and that NATO was prepared to use nuclear weapons first if necessary to prevent a Warsaw Pact conquest of Europe.

The 1979 intermediate-range nuclear forces (INF) dual-track decision grew out of a crisis of confidence among America's European allies in the credibility of the flexible response doctrine following the Soviet deployment of the highly-accurate SS-20 intermediate-range nuclear ballistic missile in the mid-1970s. The allies' concern was that Moscow's ability to use the non-strategic SS-20 to strike key sites throughout Europe that were necessary for U.S. defense against a Soviet invasion could "decouple" the United States from its allies.⁵⁶

At the time, there were no NATO medium-range missiles in Europe (only short-range missiles, rockets, and artillery). Thus a surprise attack with SS-20s on NATO Europe could present the United States with two unpalatable options: to escalate to the use of strategic forces, and thus invite massive Soviet retaliation against the United States; or to capitulate and allow a Soviet conquest of Europe.

Allied doubts were put to rest by the 1979 decision to station 108 U.S. Pershing II ballistic missiles and 464 U.S. Gryphon ground-launched cruise missiles in Europe, filling the

⁵⁵ *Decisions of Defence Planning Committee in Ministerial Session, NATO Strategy Documents 1949 - 1969*, DPC/D(67)23 - 11.5.1967, May 11, 1967, <https://www.nato.int/archives/strategy.htm>.

⁵⁶ This analysis is based on the author's participation in the decision-making on the INF dual-track decision as a foreign service officer in the Department of State's Bureau of Politico-Military Affairs from 1977 to 1979. A short history of the decision can be found in Jason Saltoun-Ebin and Andrea Chiampan, "The Reagan Files: The Euromissiles Crisis to the Intermediate Range Nuclear Forces Treaty, 1979-1987," *The Reagan Files*, Oct. 17, 2011, <http://www.thereaganfiles.com/document-collections/inf-treaty.html>; Ulrich Kühn and Ann Peczeli, "Russia, NATO, and the INF Treaty," *Strategic Studies Quarterly* 11, no. 1 (Spring 2017), https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-11_Issue-1/Peczeli.pdf, also republished at <https://carnegieendowment.org/2017/02/28/russia-nato-and-inf-treaty-pub-68124>; and in William Burr, ed., "Thirtieth Anniversary of NATO's Dual-Track Decision," George Washington University National Security Archive, Dec. 10, 2009, <https://nsarchive2.gwu.edu/nukevault/ebb301/index.atm>.

perceived gap in the escalation ladder by providing NATO a credible, accurate, Europe-based “deep strike” option. The deployment of these new intermediate-range systems began in 1983, despite massive popular protests in the five basing countries. Although Moscow initially walked out of negotiations and sought to exploit the protests to derail the decision, NATO solidarity held, leading to the signature of the INF Treaty in 1987, the first agreement to eliminate a whole class of nuclear weapons. The INF Treaty increased stability in Europe and gave a strong impetus to the negotiation of agreements over the next two decades to reduce strategic nuclear weapons. Allies also sought to negotiate reductions in short-range and tactical nuclear weapons, although the collapse of the Soviet Union led instead to the parallel, unilateral “Presidential Nuclear Initiatives” of 1991–1992.⁵⁷

Deterrence on the Back Burner After the Cold War

With the end of the Cold War, the danger of direct military conflict receded as both sides dramatically reduced their conventional and nuclear forces in Europe. Indeed, deterrence practically went out of fashion in the West with the dissolution of the Warsaw Pact and the breakup of the Soviet Union. In the 1997 NATO-Russia Founding Act,⁵⁸ NATO and Russia declared that they no longer viewed each other as adversaries. Many politicians and defense officials across the political spectrum in the United States argued that deterrence and negotiated arms control agreements were no longer even necessary at a time of growing strategic partnership between a democratic Russia and the North Atlantic alliance.⁵⁹

⁵⁷ “The Presidential Nuclear Initiatives (PNIs) on Tactical Nuclear Weapons at a Glance,” Arms Control Association, last reviewed July 2017, <https://www.armscontrol.org/factsheets/pniglance>. See also Susan J. Koch’s “The Presidential Nuclear Initiatives of 1991 – 1992,” Center for the Study of Weapons of Mass Destruction, National Defense University, https://wmdcenter.ndu.edu/Portals/97/Documents/Publications/Case Studies/cswmd_cs5.pdf.

⁵⁸ *Founding Act on Mutual Relations, Cooperation and Security between NATO and the Russian Federation signed in Paris, France*, North Atlantic Treaty Organization, May 27, 1997, https://www.nato.int/cps/en/natohq/official_texts_25468.htm?selectedLocale=en.

⁵⁹ Prominent advocates of this view were John Bolton, under secretary of state for arms control and international security in the George W. Bush administration, and President Bush himself. See “Expounding Bush’s Approach to U.S. Nuclear Security: An Interview with John R. Bolton,” Arms Control Association, accessed Aug. 10, 2021, <https://www.armscontrol.org/act/2002-03/features/expounding-bushs-approach-us-nuclear-security-interview-john-r-bolton>; and “President Bush’s Speech on Nuclear Strategy,” May 1, 2001,

While NATO sometimes mentioned nuclear deterrence in its ministerial communiqués, the focus of the debate within the alliance shifted to reducing NATO’s reliance on nuclear weapons.⁶⁰ Through the 1990s, the United States and NATO took several steps toward that end, including de-targeting nuclear weapons, eliminating nuclear contingency plans, and reducing NATO’s non-strategic nuclear forces from more than 6,000 warheads at the height of the Cold War to the current total of fewer than 300 air-dropped bombs. NATO also separated nuclear and conventional warfighting in NATO military exercises. Responding to President Barack Obama’s vision of a nuclear-free world in his Prague speech of April 2009, NATO’s Strategic Concept of 2010 and Deterrence and Defense Posture Review of 2012 made clear that NATO’s aim was to further reduce the number and salience of nuclear weapons in NATO strategy.⁶¹ NATO reiterated that the conditions in which nuclear weapons would be used were “extremely remote.”⁶²

Back to Basics After 2014

All this changed in 2014. With Russia’s aggression against Ukraine and the demonstration of its willingness to use force to undermine the international rules-based order, NATO faced a new strategic reality. Suddenly strategic competition with an aggressive Russia was back on

Arms Control Association, accessed Aug. 10, 2021, <https://www.armscontrol.org/act/2001-06/president-bush%E2%80%99s-speech-nuclear-strategy>.

⁶⁰ For additional background, see Jessica Cox, “Nuclear Deterrence Today,” NATO Review, June 8, 2020, <https://www.nato.int/docu/review/articles/2020/06/08/nuclear-deterrence-today/index.html>; and Camille Grand, “Nuclear Deterrence and the Alliance in the 21st Century,” NATO Review, July 4, 2016, <https://www.nato.int/docu/review/articles/2016/07/04/nuclear-deterrence-and-the-alliance-in-the-21st-century/index.html>.

⁶¹ For Obama’s Prague speech, see “Remarks by President Barack Obama in Prague as Delivered,” Obama White House Archives, April 5, 2009 <https://obamawhitehouse.archives.gov/the-press-office/remarks-president-barack-obama-prague-delivered>. For NATO’s 2010 Strategic Concept, see “Active Engagement, Modern Defence: Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organisation adopted by Heads of State and Government in Lisbon,” North Atlantic Treaty Organization, Nov. 19, 2010, https://www.nato.int/cps/en/natohq/official_texts_68580.htm. For the 2012 Deterrence and Defense Posture Review, see “Deterrence and Defence Posture Review,” North Atlantic Treaty Organization, May 20, 2012, https://www.nato.int/cps/en/natohq/official_texts_87597.htm?selectedLocale=en.

⁶² This formula was first used in “The Alliance Strategic Concept,” North Atlantic Treaty Organization, April 24, 1999, par. 64, https://www.nato.int/cps/en/natolive/official_texts_27433.htm.

the agenda. NATO once again had to worry about the threat of conventional aggression, especially against the vulnerable Baltic states and Poland. Although NATO now enjoyed overall conventional superiority to Russia, it had to reckon with Russia's ability to concentrate forces suddenly and embark on a short-warning attack or land grab in the Baltic states. Such an attack could catch NATO, with very few forward forces and a cumbersome decision-making process, wholly unprepared. If allies were unable to mobilize forces quickly enough to respond to an incursion, it would allow Moscow to present the alliance with a *fait accompli* — forcing it either to capitulate or escalate to nuclear weapons.

NATO's focus beginning with the Wales Summit in 2014 was to reestablish a credible *conventional* deterrence posture based on the capacity to reinforce the eastern flank quickly in a crisis.⁶³ It was no longer realistic or affordable to deploy large conventional forces along the eastern flank as in the Cold War, and the alliance's standing rapid-reaction force, the NATO Response Force, was not capable of deploying quickly enough to meet a possible Russian attack.

As a first step toward filling the gap, allies agreed at Wales to create a Very High-Readiness Joint Task Force to deploy rapidly in a crisis. At the Warsaw Summit two years later, allies agreed to deploy an “enhanced Forward Presence” — battalion-sized multinational battlegroups in the three Baltic states and Poland — as a tripwire. The four enhanced Forward Presence battalions — in place since 2017 and led by Germany, the United Kingdom, Canada, and the United States, and backed by troops from 18 other allies — make clear that any aggression by Moscow would immediately encounter forces from across the alliance, not just local forces, even before reinforcements arrived. But allies recognize that the small battalions alone cannot deter Russia. Reinforcement remains the key, and NATO

⁶³ This summary is based on the author's participation in NATO policy deliberations from 2012 to 2018 when he served as the alliance's deputy secretary general and subsequently as a member of a senior experts' group advising the NATO supreme allied commander Europe. For an overview of NATO's efforts to bolster its conventional defense and deterrence posture post-2014, see Alexander R. Vershbow and Philip M. Breedlove, *Permanent Deterrence: Enhancements to the US Military Presence in North Central Europe*, Atlantic Council, Feb. 7, 2019, <https://www.atlanticcouncil.org/in-depth-research-reports/report/permanent-deterrence/>; and “Deterrence and Defence,” North Atlantic Treaty Organization, Fact Sheet, June 25, 2021, https://www.nato.int/cps/en/natohq/topics_133127.htm.

still faces shortcomings in its rapid-reaction forces as well as in air defense, electronic warfare, intelligence, surveillance and reconnaissance, and deep-strike capabilities.⁶⁴

The strategy of deterrence by rapid reinforcement was further strengthened in 2017–2018 with the enhancement of the NATO command structure, the adoption of a new NATO military strategy (the first update in a decade), a joint NATO-European Union effort to improve military mobility, and the launch of the NATO Readiness Initiative, known as the “four thirties.” Under this initiative, allies committed to maintain 30 ground battalions, 30 air squadrons, and 30 surface combatant ships at a high readiness capable of deployment in 30 days or less.⁶⁵

Although nuclear weapons remained a delicate political subject in many NATO countries, allies agreed that the renewed threat of Russian conventional aggression made it necessary to retain nuclear deterrence as an insurance policy in the event conventional deterrence failed. Although they decided at the 2016 Warsaw Summit that the reduced post-Cold War NATO nuclear force posture was sufficient, they took steps to enhance the readiness and security of allied dual-capable aircraft that formed the backbone of NATO’s in-theater deterrent.⁶⁶

At Warsaw, allies also sharpened NATO’s nuclear declaratory policy to counter Russia’s so-called “escalate to deescalate” strategy, under which Moscow maintained the option of first nuclear use to settle a conventional conflict on Russia’s terms. Allies made clear that “any employment of nuclear weapons against NATO would fundamentally alter the nature of a conflict,” and they warned Moscow that “NATO has the capabilities and resolve to impose costs on an adversary that would be unacceptable and far outweigh the benefits that any adversary could hope to achieve.”⁶⁷

⁶⁴ See Vershbow and Breedlove, *Permanent Deterrence*.

⁶⁵ See “Brussels Summit Declaration,” North Atlantic Treaty Organization, July 11, 2018, paragraphs 14ff, https://www.nato.int/cps/en/natohq/official_texts_156624.htm?selectedLocale=en.

⁶⁶ Background information provided to author by NATO nuclear policy directorate, July 2016. Also see “Warsaw Summit Communiqué,” North Atlantic Treaty Organization, July 9, 2016, paragraphs 53–54 https://www.nato.int/cps/en/natohq/official_texts_133169.htm?selectedLocale=en.

⁶⁷ North Atlantic Treaty Organization, “Warsaw Summit Communiqué,” paragraph 54.

NATO thinking evolved further during the Trump administration, in the wake of the Russian violation of the INF Treaty through the deployment of an intermediate-range cruise missile (the 9M729 — in NATO parlance, the SSC-8) that led the United States to withdraw from that landmark accord.⁶⁸ While the return of intermediate-range Russian missiles raised concerns about strategic stability, the main concern was the additional threat the 9M729 could pose to NATO's ability to move conventional forces to the eastern flank (its so-called anti-access/area denial, or A2/AD, capabilities, centered on Kaliningrad in the north and occupied Crimea in the south). Allies decided that NATO did not need to reintroduce any new classes of nuclear-armed missiles in Europe to offset the 9M729 but that they would consider possible conventional responses that could neutralize the A2/AD threat.⁶⁹ The termination of the INF Treaty also opened the way for possible U.S. deployments of conventionally armed, intermediate-range missiles in the Asia-Pacific region to counter growing Chinese missile capabilities not covered by the bilateral INF Treaty.

Reflecting continued concern about Russia's sizeable arsenal of non-strategic nuclear weapons and its escalate-to-deescalate strategy, the Trump administration decided, as part of its 2018 *Nuclear Posture Review*, to deploy low-yield W76-2 warheads on a small number of submarine-launched ballistic missiles and to develop a new sea-launched cruise missile, restoring a type of nuclear delivery system from the 1980s that had been retired in 2010.⁷⁰ The aim, reminiscent of the INF dual-track decision, was to show Russia that the United States had a wider range of options for limited nuclear strikes to respond to Russian first use of non-strategic nuclear weapons in Europe. By adding additional rungs to the escalation ladder, the United States was conveying the message to Moscow (and to its allies in Europe and Asia) that it could retaliate without escalating to the strategic level.

⁶⁸ For a review of the history of the INF Treaty and Russia's violation with the 9M729, see "The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance," Arms Control Association, last reviewed August 2019, <https://www.armscontrol.org/factsheets/INFtreaty>.

⁶⁹ See "NATO and the INF Treaty," North Atlantic Treaty Organization, Aug. 2, 2019, https://www.nato.int/cps/en/natohq/topics_166100.htm.

⁷⁰ *Nuclear Posture Review Executive Summary*, The White House, February 2018, <https://media.defense.gov/2018/Feb/02/2001872877/-1/-1/1/EXECUTIVE-SUMMARY.PDF>.

Current and Future Challenges

While allies have been supportive of the W76-2 and sea-launched cruise missile aspects of the 2018 *Nuclear Posture Review*, these programs may be reevaluated by the Biden administration as being too costly and of limited deterrent value.⁷¹ Some experts are concerned that the use of the W76-2 in a crisis could increase the risk of uncontrolled escalation, since Russia could not be sure that the missiles launched to conduct limited strikes did not carry high-yield warheads and were not the first salvo in a strategic attack.

The Biden administration has also stated publicly that it will consider the possibility of moving to a “sole purpose” declaratory posture, under which nuclear weapons would be used only to deter or respond to a nuclear attack.⁷² While this would reduce the role of nuclear weapons in NATO deterrence strategy, it would not necessarily remove the rationale for low-yield warheads and nuclear-armed sea-launched cruise missiles. But ruling out any use of nuclear weapons in response to conventional aggression could be controversial within the alliance, as well as in the Congress, given the difficulty of deterring Russian aggression with conventional forces alone. It could be seen by Russia as a signal that the United States would be willing to accept a loss of territory in Europe to a Russian conventional attack rather than resort to nuclear weapons. It should be noted that Russia makes no such “sole purpose” claim but leaves ambiguous the circumstances that could warrant the use of nuclear weapons.

Looking to the longer term, NATO allies will need to reckon not only with Russia’s expanding non-strategic nuclear arsenal following the demise of the INF Treaty but with the advent of new technologies such as hypersonic delivery systems and AI-enabled systems. Many analysts worry that these capabilities could upend the traditional basis for

⁷¹ See Michael R. Gordon, “Biden to Review U.S. Nuclear-Weapons Programs, With Eye Toward Cuts,” *Wall Street Journal*, Dec. 24, 2020, <https://www.wsj.com/articles/biden-to-review-u-s-nuclear-weapons-programs-with-eye-toward-cuts-11608805800>.

⁷² See Sophia Becker and Elisabeth Suh, “How Biden’s plan to limit the role of nuclear weapons challenges NATO,” German Council on Foreign Relations, May 18, 2021, <https://dgap.org/en/research/publications/how-bidens-plan-limit-role-nuclear-weapons-challenges-nato>.

nuclear deterrence based on an assured second-strike capacity on both sides.⁷³ The United States and its allies will also need to take into account the growing nuclear and conventional capabilities of China and its willingness to use military power to expand its influence in the Asia-Pacific region and beyond.

It is not yet clear that the reintroduction of INF missiles or the deployment of hypersonic missiles will be game-changers for deterrence. Though they could make it somewhat harder to control escalation in a crisis between NATO and Russia, they may not be able to neutralize fully either side's assured second-strike capability. Nevertheless, the United States and its allies should consider how arms control could be used to reduce the impact of these technologies and maintain strategic stability for the longer term.

In the case of the 9M729, Russia has thus far produced only limited numbers of the INF Treaty-busting cruise missile, and it is unclear whether any are deployed with nuclear warheads. While conventional cruise missiles now have the accuracy to carry out strategic strikes and should, ideally, be subject to numerical constraints, it would be to NATO's advantage to prevent Russia from deploying nuclear-armed 9M729s and any other new missiles capable of no- or short-warning strikes on NATO targets launched from Russian territory. Such a capability could recreate the anxieties about deterrence and "decoupling" of the U.S. nuclear guarantee that led to the 1979 dual-track decision.

To avoid this, allies would almost certainly support a proposal by the Biden administration to ban U.S. and Russian nuclear-armed short- and intermediate-range missiles — whether globally or from the Atlantic to the Urals — as part of a follow-on to the New Strategic Arms Reduction Treaty (START). While verifying the absence of nuclear warheads would be difficult, a U.S.-Russian ban on nuclear-armed INF missiles would limit the impact of the loss of the INF Treaty on strategic stability and avoid the need for politically controversial INF deployments on NATO soil. It would, at the same time, leave NATO free to deploy a range of conventionally armed missile systems to counter Russian deep-strike capabilities along with its A2/AD capabilities intended to degrade NATO's capacity to reinforce the

⁷³ See Andrew Futter, "The Risks Posed by Emerging Technologies to Nuclear Deterrence," in *Perspectives on Nuclear Deterrence in the 21st Century*, Chatham House, April 20, 2020, <https://www.chathamhouse.org/2020/04/perspectives-nuclear-deterrence-21st-century-0/1-introduction>.

eastern flank. It would also protect U.S. options to deploy conventionally armed intermediate-range missiles in East Asia to counter China's growing intermediate-range missile capabilities.

Arms control could also help mitigate the risks that hypersonic missiles may pose — risks that should not be exaggerated. Hypersonic missiles are not an entirely new phenomenon.⁷⁴ ICBMs and submarine-launched ballistic missiles already reach hypersonic speeds in their ballistic trajectory, and neither side has the technical capacity to defend against a large-scale strategic missile attack using current missile defense technologies. Russia cites the need to overcome U.S. ballistic missile defense systems as its justification for developing hypersonic missiles and other novel systems, when in fact U.S. ballistic missile defense systems are optimized to defend against much smaller attacks from rogue states with far more primitive missile technology than Russia's. It also should be noted that Russia has developed and deployed advanced ballistic missile defense systems of its own and is far more advanced than the West in cruise missile defense.⁷⁵

That said, it is true that Russian hypersonic cruise missiles launched from ground, aircraft, and ships, as well as hypersonic glide vehicles launched by ICBMs, could significantly shorten warning times by avoiding early detection and by flying at Mach 5 at very low altitudes. Plus, their maneuverability and dual-capability will increase uncertainty about where they are targeted and whether they are nuclear or conventionally armed. This could be destabilizing if it were to lead a defender to launch a nuclear retaliatory strike on warning of attack before being able to confirm the nature and scale of the incoming missiles. In the

⁷⁴ Russia has two hypersonic systems in development: The *Avangard* hypersonic glide vehicle (HGV), designed to be carried by an intercontinental ballistic missile; and the *Kinzhal* (Dagger) hypersonic cruise missile, already carried by MiG-31 fighters. See Tony Wesolowsky, "Here's What We Know About Russia's New Generation of Nuclear-capable weapons," Radio Free Europe/Radio Liberty, Feb. 19, 2019 <https://www.rferl.org/a/here-s-what-we-know-russia-s-new-generation-of-nuclear-capable-weapons/29778663.html>.

⁷⁵ See Jim Garamone, "Missile Defense Becomes Part of Great Power Competition," *DOD News*, July 28, 2020, <https://www.defense.gov/Explore/News/Article/Article/2291331/missile-defense-becomes-part-of-great-power-competition/>.

worst case, a limited conventional hypersonic missile strike could accidentally trigger an all-out nuclear exchange.⁷⁶

There also could be significant risks if hypersonic weapons, operating together with AI-enabled sensors in space and under the sea, achieved the capability to locate and target presently invulnerable systems like submarine-launched ballistic missiles or land-mobile ICBMs before they could be dispersed. In the worst case, this could be seen as depriving the other side of an assured retaliatory capability, undermining the fundamental basis for deterrence and strategic stability.⁷⁷

This risk could be reduced, however, if the number of hypersonic weapons was limited by a future START agreement and if submarine-launched ballistic missiles were distributed among a larger number of at-sea platforms to increase survivability. To incentivize Russia to agree to limits on its hypersonic deployments, the United States may need to offer a cap or at least greater transparency on U.S. and NATO missile defense deployments in Europe, which Russia claims are driving their deployment of hypersonic technologies.⁷⁸

Deterrence in the Gray Zone

NATO thinking on deterrence today, even more than in the Cold War, should go beyond conventional and nuclear weapons to encompass cyber and other gray-zone threats. Offensive cyber capabilities offer the means to inflict strategic effects without the direct use of military force — such as by disabling nuclear missiles in their launchers or by destroying or disrupting reconnaissance and command-and-control systems. Cyber capabilities complement the more traditional basket of tools used by Russia to destabilize its adversaries below the level of armed conflict (such as political subversion, economic

⁷⁶ See Dean Wilkening, “Hypersonic Weapons and Strategic Stability,” *Survival* 61, no. 5 (October–November 2019): 129–48, <https://doi.org/10.1080/00396338.2019.1662125>; and Andrew W. Reddie, “Hypersonic Missiles: Why the New “Arms Race” Is Going Nowhere Fast,” *Bulletin of the Atomic Scientists*, Jan. 13, 2020 <https://thebulletin.org/2020/01/hypersonic-missiles-new-arms-race-going-nowhere-fast/>.

⁷⁷ See Futter, “The Risks Posed by Emerging Technologies to Nuclear Deterrence.”

⁷⁸ Thibaut Marchand and Sylvia Lanteaume “With Cutting-Edge Hypersonics, Russia Leads in New Arms Race,” *Moscow Times*, July 22, 2021, <https://www.themoscowtimes.com/2021/07/22/with-cutting-edge-hypersonics-russia-leads-in-new-arms-race-a74588>.

sabotage, disinformation, and fomenting separatism). Russia uses these so-called hybrid means to undermine states and alliances, damage infrastructure, and erode social cohesion, all while concealing the identity of the attacker.⁷⁹

NATO has sought to deter cyber aggression, first of all, by declaring that even though the Washington Treaty refers to “armed attack” as the basis for NATO action under Article 5, a cyber attack could inflict sufficient damage to be considered the functional equivalent of an armed attack, triggering Article 5.⁸⁰ Beyond this, deterrence in the gray zone may depend on developing the capability to inflict equal or greater damage in response to large-scale cyber aggression and to make clear that NATO reserves the right to react symmetrically (i.e., cyber vs. cyber) or asymmetrically, to include kinetic and non-kinetic options such as sanctions. In this regard, the adapted NATO Command Structure includes a new 24/7 cyber operations center at its main headquarters and allies have agreed that NATO’s Supreme Allied Commander for Europe can turn to nations with offensive cyber capabilities if needed in a conflict.⁸¹

Deterring gray-zone threats poses a more difficult challenge. Efforts to define a “red line” of conflict that must not be passed by nature encourage adversaries to take action perceived as below the red line. On the deterrence side, ambiguity and flexibility can help, but more important will be to strengthen allied nations’ own resilience — to harden critical infrastructure, reduce societies’ vulnerability to subversion and disinformation, expose and shut down the movement of dark money and other sources of corruption, and improve internal security and intelligence sharing within governments and across the NATO

⁷⁹ See Jamie Shea, “Deterrence Below the Threshold of Collective Defence: Is It Possible?” in *Perspectives on Nuclear Deterrence in the 21st Century*.

⁸⁰ This policy was first announced at the NATO 2014 Wales Summit and further elaborated at the Brussels Summit in June 2021. See Steve Ranger, “NATO Updates Policy: Offers Members Article 5 Protection Against Cyber Attacks, Atlantic Council,” Atlantic Council, June 30, 2014, <https://www.atlanticcouncil.org/blogs/natosource/nato-updates-policy-offers-members-article-5-protection-against-cyber-attacks/>; and Maggie Miller, “NATO Members Agree to New Cyber Defense Policy,” *The Hill*, June 14, 2021, <https://thehill.com/policy/cybersecurity/558383-nato-member-states-agree-to-new-cyber-defense-policy-following>.

⁸¹ See “Cyber Defence,” North Atlantic Treaty Council, July 2, 2021, https://www.nato.int/cps/en/natohq/topics_78170.htm.

alliance. Allies also need to be more effective in pushing back against Russian disinformation and propaganda.⁸² NATO-EU cooperation on combating disinformation and establishing centers of excellence, such as the European Center of Excellence for Countering Hybrid Threats (Finland), the NATO Strategic Communications center of excellence (Latvia), and the NATO Energy Security center of excellence (Lithuania) are all important steps in this regard.

Conclusion

The bottom line is that deterrence is credible if it convinces Russia or any other adversary to refrain from aggression by complicating their choices and assuring that, under any scenario, the costs will outweigh any conceivable benefits. This requires effective, survivable capabilities and a declaratory posture that leave the adversary in no doubt that it will lose more than it will gain from aggression, whether it is a short-warning conventional attack, nuclear first use to deescalate a conventional conflict, a cyber attack on critical infrastructure, or a hybrid campaign to destabilize allies' societies.

Although it should remain NATO's long-term goal to reduce its reliance on nuclear weapons as much as possible, it is premature to shift to a posture under which the sole purpose of nuclear weapons would be to respond to nuclear attack. The improvements to NATO's conventional deterrence posture undertaken since 2014 are a work in progress and still need to be backed up by the option to escalate to the use of nuclear weapons as a last resort if deterrence fails. NATO should also maintain a mix of strategic and non-strategic nuclear options to dissuade Russia from believing it can succeed with its "escalate to deescalate" strategy. That said, the low-yield W76-2 submarine-launched ballistic missile warhead and new nuclear-armed sea-launched cruise missile may not be essential given other U.S. nuclear modernization programs and the upgrade of allies' dual-capable aircraft assigned to the nuclear mission. Creative pursuit of arms control constraints on INF and other non-strategic nuclear weapons, and on hypersonic and other non-ballistic weapons delivery systems, could help maintain deterrence and preserve stability at lower force levels.

⁸² See Alexander Vershbow, "Ramp up on Russia," in NATO 20/2020, Atlantic Council, Oct. 14, 2020, <https://www.atlanticcouncil.org/content-series/nato20-2020/ramp-up-on-russia/>.

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5. Anti-Nuclear Sentiment and the Continuing Relevance of Nuclear Deterrence

By Kristin Ven Bruusgaard

This past January, the Treaty on the Prohibition of Nuclear Weapons entered into force, after 50 states ratified it.⁸³ This disarmament treaty is unlikely to contribute to reducing nuclear arsenals, given that no nuclear weapons state has expressed any interest in joining it. But the treaty does capture a contemporary sentiment among many non-nuclear NATO member states: that nuclear deterrence is unfashionable, untenable, and out of date. Civil

⁸³ “Guterres Hails Entry Into Force of Treaty Banning Nuclear Weapons,” *UN News*, Jan. 22, 2021, <https://news.un.org/en/story/2021/01/1082702>.

society movements and political youth parties in Europe are pushing the treaty's agenda hard.⁸⁴ Nuclear deterrence, to them, has run its course.

The humanitarian rationale for never employing nuclear weapons is compelling and a key reason for the popularity of this anti-nuclear sentiment across Europe.⁸⁵ It remains a fact that nuclear weapons can bring existential destruction to humanity. The *Bulletin of Atomic Scientists'* Doomsday Clock concludes that we are closer than ever to midnight.⁸⁶

But the security policy rationale for discarding nuclear weapons and nuclear deterrence without thoroughly assessing their alternative is much less compelling. The argument that nuclear deterrence is outdated is detached from the rationale for acquiring nuclear weapons: to enhance states security. It disregards contemporary risks of great-power confrontation. Most critically, it fails to consider what alternative security measures states are likely to take in the absence of nuclear weapons.

Nuclear Weapons and the Pursuit of Security

States that have, or aspire to have, nuclear capabilities do so because of a perceived security need. There is a reason nuclear weapons remain “the absolute weapon.” The potential of nuclear weapons to shape the behavior of other states is simply unique, as characterized by Bernard Brodie.⁸⁷ The nine states that have acquired nuclear weapons have done so to provide security against what they perceive to be the most pressing threats they are facing, whether nuclear or conventional.

⁸⁴ “About ICAN Norway,” ICAN Norway, https://www.icannorway.no/ican_norway_english; “Towards a Nuclear Weapons Free Europe,” European Greens, accessed Aug. 13, 2021, <https://europeangreens.eu/content/towards-nuclear-weapons-free-europe>.

⁸⁵ Manuel Lafont Rapnouil, Tara Varma, and Nick Witney, “Eyes Tight Shut: European Attitudes Towards Nuclear Deterrence,” European Council on Foreign Relations, Dec. 19, 2018, https://ecfr.eu/special/eyes_tight_shut_european_attitudes_towards_nuclear_deterrence/.

⁸⁶ John Mecklin, ed., “This Is Your COVID Wake-up Call: It Is 100 Seconds to Midnight 2021 Doomsday Clock Statement,” *Bulletin of the Atomic Scientists*, Jan. 27, 2021, <https://thebulletin.org/wp-content/uploads/2021/01/2021-doomsday-clock-statement-1.pdf>.

⁸⁷ Bernard Brodie, “The Development of Nuclear Strategy,” *International Security* 2, no. 4 (Spring 1978): 65–83, <https://www.jstor.org/stable/2538458>.

The latter point is important. Not all nuclear weapons states have pursued nuclear capability to match or deter a nuclear threat. Some states seek to influence a conventionally superior or geographically dominant enemy. The utility of nuclear weapons is not universal across nuclear weapons states. Each state's needs differ, including in relation to other available options they have for preserving their own security. For Pakistan, for example, nuclear weapons remain an essential tool for influencing a conventionally superior India. The states that derive security from nuclear weapons, through their own possession of those weapons or through security guarantees from other nuclear states, will have to pursue that security by other means in the absence of nuclear weapons. This must inform our analysis of the consequences of prohibiting them.

Renewed Great-Power Competition and the Risk of Conflict

The idea that nuclear deterrence is outdated is out of sync with the contemporary security policy context. International relations today are deeply colored by renewed great-power competition between the United States, Russia, and China. The changing distribution of power may produce less peaceful outcomes than what we have seen over the past 70 years. U.S. think tanks keep churning out reports on how the United States should best compete against China.⁸⁸ China's leaders remain convinced that the United States is determined to prevent its inevitable rise. Russia is determined to remain a great power, while the United States depicts Russia as a declining power and displays little interest in considering Russian security concerns.

To all these great powers, nuclear weapons and nuclear deterrence remain a critical security guarantee. Of the three, Russia seems to rely the most on its nuclear weapons. But the United States also relies on nuclear weapons to deter and manage potential crises with either of the other two countries. Its nuclear arsenal is being modernized to fit this bill.⁸⁹

⁸⁸ Benjamin Zala (@DrBeeZee), "Another report on how to better compete with China from a D.C. think tank. I wonder how all those great powers managed to compete with each other in centuries past without think tank reports to tell them how? They must have been really clever. Thread..." Twitter, Jan. 13, 2021, <https://twitter.com/DrBeeZee/status/1349149791637303297>.

⁸⁹ Hans M. Kristensen and Matt Korda, "United States Nuclear Weapons," *Bulletin of the Atomic Scientists* 77, no. 1 (2021): 43-63, <https://doi.org/10.1080/00963402.2020.1859865>.

Some argue nuclear weapons play a lesser role in Chinese strategy as compared to U.S. and Russian nuclear strategies,⁹⁰ but recent changes in Chinese nuclear policy raise renewed concerns about Chinese nuclear intentions.⁹¹

How nuclear weapons influence the risk of conflict is contested. Many argue that nuclear weapons contribute to deterring great-power conflict and point to the fact that the Cold War remained cold.⁹² Although this claim is difficult to prove, we do know that nuclear weapons contributed to significantly shaping superpower behavior in this era. Moreover, nuclear weapons states clearly have faith in this logic. On the other hand, one could argue that nuclear weapons pose a significant and growing risk in the event of a conflict. Any conflict in which the great powers perceive that their vital national interests are at stake would likely go nuclear, unless one side were to concede to the other's demands. Many point to novel risks of entanglement because of an increased commingling of nuclear and conventional strike systems.⁹³ Other emerging technologies may also reduce crisis stability and increase the risk of nuclear escalation.⁹⁴

What Are the Alternatives?

So, should we trade known risks for unknown ones? We do not know how the partial or full absence of nuclear weapons would affect relations among the great powers. This raises two

⁹⁰ Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security* 40, no. 2, (Fall 2015): 7–50, https://doi.org/10.1162/ISEC_a_00215.

⁹¹ James Cameron, "Chinas Silos: New Intelligence, Old Problems," *War on the Rocks*, Aug. 12, 2021 <https://warontherocks.com/2021/08/beijings-silos-new-intelligence-old-problems/>.

⁹² See for example Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate Renewed* (2nd ed.) (New York: W.W. Norton & Company, 2002)

⁹³ James M. Acton, Tong Zhao, and Li Bin, "Reducing the Risks of Nuclear Entanglement," Carnegie Endowment for International Peace, Sept. 12, 2018, <https://carnegieendowment.org/2018/09/12/reducing-risks-of-nuclear-entanglement-pub-77236>.

⁹⁴ Todd S. Sechser, Neil Narang, and Caitlin Talmadge, "Emerging technologies and strategic stability in peacetime, crisis, and war," *Journal of Strategic Studies* 42, no. 6, (2019): 727–35, <https://doi.org/10.1080/01402390.2019.1626725>.

critical questions. The first is whether conventional weapons can serve to deter nuclear threats. The second is what a conventionalized deterrence landscape would look like. Consider a world in which more states sign the Treaty on the Prohibition of Nuclear Weapons, including some NATO allies, but in which the nuclear weapons states remain reluctant to engage. Putting aside questions about whether it would be possible to remain a NATO member while in the treaty,⁹⁵ or whether NATO as an alliance would survive this, treaty proponents argue that NATO members that choose to sign the treaty should rely on conventional capabilities to deter nuclear threats. But is this viable?

Most scholars argue that conventional weapons are less effective deterrent tools than nuclear weapons.⁹⁶ The rapid and unprecedented destruction caused by nuclear weapons sets them apart. Making the threat of conventional denial or punishment credible requires more than nuclear threats: Conventional weapons inflict less damage than do nuclear weapons and can be easier to defend against than nuclear weapons. For these reasons, a larger amount of conventional precision-strike munitions are needed to deter nuclear threats as compared to nuclear weapons.⁹⁷ The potential of conventional missiles is untested in a contested environment. Sustained arms racing also serves to undermine the deterrent effect of conventional weapons. States that rely on conventional deterrence may have to demonstrate their conventional capabilities on a more regular basis, which could increase the rate and intensity of conflicts.

A partly or fully conventionalized deterrence landscape could be less stable and more conflict prone than the current one. The increased U.S. reliance on conventional deterrence has not led others to follow suit. Instead, U.S. conventional preponderance has produced an increased adversary emphasis on nuclear threats.⁹⁸ Since the end of the Cold War,

⁹⁵ Heather Williams, "What the Nuclear Ban Treaty Means for America's Allies," *War on the Rocks*, Nov. 5, 2020, <https://warontherocks.com/2020/11/what-the-nuclear-ban-treaty-means-for-americas-allies/>.

⁹⁶ Samuel P. Huntington, "Conventional Deterrence and Conventional Retaliation in Europe," *International Security* 8, no. 3 (Winter 1983-1984): 32-56, <https://doi.org/10.2307/2538699>.

⁹⁷ Corentin Brustlein, "Conventionalizing Deterrence? U.S. Prompt Strike Programs and Their Limits," Institut français des relations internationales, Proliferation Papers, No. 52, January 2015, <https://www.ifri.org/sites/default/files/atoms/files/pp52brustlein.pdf>.

⁹⁸ Kristin Ven Bruusgaard, "Russian Nuclear Strategy and Conventional Inferiority," *Journal of Strategic Studies* 44, no. 1 (2021): 3-35, <https://doi.org/10.1080/01402390.2020.1818070>.

Russia has promised nuclear first use in response to the conventional counterforce threat from U.S. precision-guided munitions. These Russian nuclear threats to go first have now produced a changed U.S. deterrence strategy with expanded nuclear options.⁹⁹ Nuclear weapons remain the only credible deterrent of nuclear employment. Although China seemingly relies more on conventional than nuclear deterrence, its nuclear deterrent remains oriented toward the potential threat from U.S. nuclear first use in a large-scale conflict. For China, U.S. conventional capabilities to deny China its objectives in the Asian-Pacific theater are potentially of diminishing concern. U.S. nuclear capabilities to target the Chinese homeland are seemingly not.

U.S. nuclear weapons are likely one factor inhibiting even more aggressive Chinese and Russian policies in their respective neighborhoods. A world without nuclear weapons could produce more frequent albeit less destructive wars. These could cause destruction and devastation of a kind that we have not seen since the last world war. Although we cannot know, it may be that nuclear weapons will contribute to preserving the peace among great powers. The consequences of removing them from deliberations over the costs of aggression are unknown.

The idea of nuclear deterrence is old, even old-fashioned. However, the security threats nuclear weapons continue to mitigate are as pressing as ever. Although the idea of abolishing these weapons may seem attractive to publics and politicians alike, the implications of their abolition are complex and uncertain. Reducing this uncertainty through a more thorough debate over how states will take measures to secure themselves, absent nuclear weapons, is critical. That discussion is fundamental to determine whether a world without nuclear weapons would be a more peaceful one.

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⁹⁹ *Nuclear Posture Review*, Department of Defense (February 2018), <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.

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