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The crisis of nuclear arms control

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Abstract The politics of nuclear arms control between the United States and Russia are in a protracted state of crisis, which is in need of explanation. This article provides an overview of bilateral contractual milestones from 1972 to 2001 and analyzes instances of cooperation through the lens of three key factors that have influenced the process. It then considers the changes that these factors have undergone over twenty years of crisis in bilateral arms control from 2001 to 2021 and gauges the possible consequences of a continuation of the current situation. It concludes that during the first period, a shared willingness to shield the bilateral process from political disruption, U.S. bipartisan support, and cooperatively addressing the vertical diffusion of offensive and defensive missile capabilities were both possible and necessary for ensuring success. During the second period, these key factors underwent significant changes and ultimately had a negative effect on the bilateral process, which makes the current crisis unique compared to earlier episodes of regression. Most importantly, both sides were no longer willing to shield the bilateral process in its entirety during this period, including defensive and sub-strategic offensive elements. With a view to future consequences, these findings point to reduced arms race stability, weaker negotiated outcomes, and an erosion of the global nonproliferation regime.

Keywords Arms control · Nuclear weapons · Cold War · Institutions · United States

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Zusammenfassung Die Politik der nuklearen Rüstungskontrolle zwischen den Vereinigten Staaten und Russland befindet sich in einer mehrjährigen Krise, die erklärungsbedürftig ist. Der vorliegende Artikel gibt zunächst einen Überblick über die bilateralen vertraglichen Meilensteine von 1972 bis 2001 und analysiert Kooperationsbeispiele anhand von drei Schlüsselfaktoren, die den Prozess beeinflusst haben. Anschließend wird untersucht, wie sich diese Faktoren in den zwanzig Jahren der Krise der bilateralen Rüstungskontrolle von 2001 bis 2021 verändert haben. Schließlich werden mögliche zukünftige Folgen abgeschätzt. Der Artikel kommt zu dem Schluss, dass eine Reihe notwendiger Erfolgsfaktoren während der ersten Kooperationsphase präsent waren. Dazu zählten die gegenseitige Bereitschaft, den bilateralen Prozess vor politischen Störungen zu schützen, eine überparteiliche Unterstützung in den USA und amerikanisch-sowjetische Zusammenarbeit bei der vertikalen Verbreitung offensiver und defensiver Raketenfähigkeiten. In der zweiten Periode veränderten sich diese Schlüsselfaktoren erheblich und wirkten sich letztlich negativ auf den bilateralen Prozess aus, was die aktuelle Krise im Vergleich zu früheren Phasen des Rückschritts einzigartig macht. Vor allem waren beide Seiten in dieser späteren Phase nicht mehr bereit, den bilateralen Prozess in seiner Gesamtheit zu schützen, einschließlich seiner defensiven und substrategischen offensiven Elemente. Mit Blick auf künftige Konsequenzen deuten diese Ergebnisse auf eine geringere Rüstungswettlaufsstabilität, weniger verbindliche Verhandlungsergebnisse und eine mögliche Aushöhlung des globalen Nichtverbreitungsregimes hin.

Schlüsselwörter Rüstungskontrolle · Nuklearwaffen · Kalter Krieg · Institutionen · Vereinigte Staaten

1 Introduction

"Arms control has certainly gone off the tracks. For several years what are called arms negotiations have been mostly a public exchange of accusations ..." One could be forgiven for thinking that this quote concerns the current state of nuclear arms control between the United States and Russia—the two countries with the world's largest nuclear arsenals. Yet Thomas Schelling wrote this observation in the winter of 1985, only two years prior to the signing of the Intermediate-Range Nuclear Forces (INF) Treaty and six years prior to the conclusion of the first Strategic Arms Reduction Treaty I (START I). Back in 1985, bilateral nuclear arms control had been experiencing a longer period of stagnation and even regression, but it was certainly alive.

Thirty-six years later, the future of nuclear arms control between Washington and Moscow remains in question. The current situation has been described in terms of "disintegration" (Arbatov 2019), "deep crisis" (Neuneck 2019), "collapse" (McGraw Olive 2019), "demise" (Krepon 2021), and even as "the end of (nuclear) arms control" (Brooks 2020; Trenin 2020). With the unravelling of the INF Treaty in 2019 and ongoing ambitious nuclear modernizations in both countries, and with the collapse of the New START agreement having been avoided by a whisker in 2021, some have concluded that the "chances are slim that new nuclear arms agreements

will be reached anytime soon" (McGraw Olive 2019). A future "world without nuclear restraint" (Tannenwald 2020)—like the world before arms control came to bear—has once more become imaginable.

To better understand the current crisis, it is necessary to look back to the beginnings of bilateral nuclear arms control and to identify the critical changes that have led to the current situation. How did a number of key factors influence previous bilateral nuclear arms control? What makes the current crisis unique compared to earlier episodes of arms control regression? And finally, what are the possible future consequences of a protracted crisis?

This article has four objectives.[1] First, it seeks to provide a concise overview of the contractual milestones of U.S.–Soviet/Russian nuclear arms control from 1972, the year the Strategic Arms Limitation Talks (SALT) yielded their first results, until 2001, when the United States announced its withdrawal from the Anti-Ballistic Missile (ABM) Treaty.[2] Second, it aims to highlight the impact of three explanatory factors that have contributed to the success and failure of bilateral nuclear arms control. The first is a shared willingness to shield bilateral arms control from political disruptions, including instances of non-compliance, and deteriorating general bilateral relations. The second factor is U.S. domestic support for and opposition to bilateral nuclear arms control. The third is the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities.[3] Third, by focusing specifically on the twenty years of crisis in bilateral nuclear arms control from the termination of the ABM Treaty in 2001 to the end of Donald J. Trump's presidency in 2021, it seeks to explain how the three factors have changed over time in order to highlight the extent to which the current crisis is unique compared to earlier episodes of arms control regression. Fourth, it considers the possible consequences of a protracted crisis both for arms race stability and future agreement-making, including with China, and for the global nonproliferation regime.

[1] This article does not focus on U.S.-Soviet/Russian nuclear nonproliferation policies, which is the topic of the article by Jana Baldus, Harald Müller, and Carmen Wunderlich on the crisis of the nuclear non-proliferation regime in this special issue. The article does, however, touch on this directly related field of politics wherever necessary to help explain the crisis and consequences of bilateral nuclear arms control. For a recent scholarly account of U.S.-Russian cooperation in the field of nuclear nonproliferation, see Bidgood and Potter (2021).

[2] There are different views and accounts of when, exactly, the crisis in bilateral nuclear arms control began. Most scholars refer to the U.S. announcement of the termination of the ABM Treaty in 2001 (see exemplary Arbatov 2019; Potter and Bidgood 2021).

[3] The impact of these three factors has been repeatedly stressed by different authors in the recent scholarly literature on U.S.–Russian arms control relations and the crisis thereof; see for example Arbatov (2019), Brooks (2020), Krepon (2021) and Trenin (2020). For an account of the bilateral crisis that focuses on the deterioration of general U.S.–Russian political relations, see for example Legvold (2016) and Wertheim (2020). For a recent account of the impact of domestic U.S. policies, see Böller (2021) and Myrick (2021). Finally, on the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities, see Arbatov (2019) and, with a special focus on missile defense capabilities, Lewis (2021). There are of course other long-term factors that have also contributed to the crisis, such as the impact of bureaucratic and/or military-industrial interest groups, the integration of novel military technologies in the realms of cyber, disinformation, and space, and the dissolution of epistemic communities after the Cold War. These additional factors are not dealt with here for reasons of space.

2 The evolution of U.S.–Soviet/Russian nuclear arms control from 1972 to 2001

This first section provides a brief descriptive overview of the contractual milestones in U.S.–Soviet/Russian nuclear arms control from the beginning of the SALT process to the termination of the ABM Treaty. Each instance of cooperation is described in terms of the main cooperation outcomes and the impact of: (1) both sides' willingness to shield bilateral arms control from political disruptions, including instances of non-compliance, and deteriorating general bilateral relations; (2) U.S. domestic support for and opposition to bilateral arms control; and (3) the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities.

2.1 The SALT process

In late 1969, U.S. and Soviet delegations began the SALT negotiations, which would result in a package deal consisting of two basic documents signed in May 1972: an Interim Agreement on Certain Measures with Respect to the Limitation of Strategic Offensive Arms and a Treaty on the Limitation of Anti-Ballistic Missile Systems, known as the ABM Treaty (Ambrose 2018). For both sides, the Interim Agreement froze the number of fixed land-based intercontinental ballistic missile (ICBM) launchers and put a cap on the number of submarine-launched ballistic missiles (SLBMs) and SLBM-capable submarines held by each party. The ABM Treaty simultaneously aimed to limit a significant technology driver of the arms race: the incipient technical capability to shoot down enemy missiles in flight by means of ballistic missiles, which threatened to undermine strategic stability (Schelling 1985). With the first technical breakthroughs reached under the U.S. Sentinel program in the 1960s, ballistic missile defense became widely discussed as a possible means of achieving strategic invulnerability. Against this background, the ABM Treaty allowed both sides to each deploy a strategic missile defense system with up to 100 interceptor missiles to protect a specific target. Verifying both accords, the sides agreed to rely on their respective National Technical Means (NTMs). In hindsight, the SALT negotiations were significant insofar as they represented the beginning of a process and dealt with the increasingly difficult offense/defense relationship between the parties.

In terms of both sides' willingness to shield the SALT negotiations from political disruptions, *détente* had clearly helped to facilitate the process since it had led to an easing of general political tensions. Still, the existence of a shared willingness to shield the arms control process became evident when the U.S. bombing campaign in Vietnam complicated the last stages of the negotiations but did not prevent both parties from reaching an agreement (Ambrose 2018). At the domestic level, Republican President Richard Nixon could build *détente* on the rather conciliatory policies of his Democratic predecessor when it came to the USSR, thus securing bipartisan domestic support for his arms control policies. In addition, the Arms Control and Disarmament Agency (ACDA), established by President John F. Kennedy in 1961 as an independent U.S. agency that reported directly to the president, had led a strong interagency negotiation team that was able to push back against reservations from

the Department of Defense (Keeny 1998). On the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities, both sides were willing to deal with the security implications of technological progress through arms control. Towards the end of the 1960s, Washington was concerned with the growing Soviet ability to deploy ABM defenses in response to the U.S. Sentinel program, while Moscow was more concerned with the U.S. technological lead in offensive strategic weapons (Arbatov 2019). The two documents connected and reflected these interrelated concerns in a constructive *quid pro quo* manner.

In November 1972, negotiations began on a follow-up agreement—SALT II—which was signed in June 1979. By then, however, the previously success-enabling factors had changed. First, both sides' willingness to shield arms control from political disruptions had declined significantly due to the waning of *détente* and the Soviet invasion of Afghanistan in December 1979. General bilateral relations deteriorated rapidly. Also at the U.S. domestic level, support for arms control came under pressure. Republican presidential candidate Ronald Reagan had vehemently opposed President Jimmy Carter's policy towards the USSR and campaigned on the promise to confront the USSR, *inter alia* by refusing to ratify SALT II (a promise on which he followed through once in office).[4] The impact of technological progress on offensive missile capabilities coupled with the further vertical diffusion of missiles likewise helped to undermine the SALT process. The vertical diffusion of new missile systems equipped with multiple warheads on both sides in the latter half of the 1970s (launchers had been limited by SALT I in conjunction with the limits devised by the ABM Treaty) had finally led to perceptions of a so-called "window of vulnerability" in the United States (Johnson 1983, Arbatov 2019). This tit-for-tat logic would soon also affect the sub-strategic level. The parallel introduction and buildup of new intermediate-range missiles on the Soviet side had meanwhile prompted concerns on the part of U.S. allies regarding a "missile gap" in Europe (Gassert, Geiger and Wentker 2020), further contributing to a longer period of stagnation in arms control. Even though SALT II never entered into force, both sides largely observed the limits the agreement would have imposed (Cirincione 2007: 40).

2.2 The INF treaty

In 1987, both sides signed the milestone INF Treaty, which eliminated all ground-launched missiles and their launchers with ranges between 500 and 5500 km. The Treaty banned not only an entire U.S./Soviet weapons category but also devised asymmetric reductions, as Moscow had to destroy more than double the number of missiles than the United States. The Treaty also mandated an entirely new set of intrusive verification measures, such as on-site inspections. Preceding the Treaty, bilateral INF talks had begun in Geneva in 1981 (Bohlen et al. 2012). The rationale for negotiating limits on sub-strategic systems originated in the aforementioned debate on a "missile gap," decoupling U.S. allies from America. That debate had

[4] It is worth noting that Carter also asked the Senate not to consider SALT II following the Soviet invasion of Afghanistan.

been triggered by the introduction of the new Soviet triple-warhead SS-20 ballistic missile, which was able to strike targets in Western Europe from deep inside the Soviet territory. As European NATO allies had no similar capabilities to match the threat, they assessed the weapon as creating a destabilizing gap in NATO's deterrence posture (Gassert et al. 2020). The result of this threat perception was the dual-track decision that threatened Moscow with the deployment of new Pershing II ballistic missiles and ground-launched cruise missiles (GLCMs) and at the same time offered the Soviet leadership arms control negotiations with the aim of reversing the Soviet lead in intermediate-range missiles.

The volatile INF process from 1981 to 1987 demonstrates the extent to which the three factors played out differently towards the beginning and at the end of the process. At the beginning of the INF talks, both sides' willingness to shield arms control talks from political disruptions, such as the deployment of U.S. missiles in Western Europe, was not strong enough to prevent the eventual breakdown of the talks. When NATO allies began to deploy new INF-range systems to Europe, the Soviet delegation walked out of the Geneva INF talks in November 1983. In Washington, Reagan's INF policy came under domestic fire from Democrats and the mainstream media (Granieri 2020, p. 8). What followed was more of a short pause than an abrogation of the process. By 1985, when the parties returned to the negotiation table, their willingness to shield the process even endured when the United States confronted Russia over non-compliance with the ABM Treaty, as Moscow had built a prohibited phased-array radar oriented for battle management at the Krasnoyarsk site (Wolfsthal 2014). The coming into office of Mikhail Gorbachev as General Secretary of the Central Committee of the Communist Party of the Soviet Union in March 1985 and his policies of *Glasnost* and *Perestroika* would soon lead to a general easing of tensions between the superpowers. At the domestic level, Reagan's apparent policy U-turn on arms control with the Soviet Union from the mid-1980s onwards did not meet serious opposition from the Democratic majorities in Congress (Granieri 2020, p. 13). Likewise, the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities played out differently during those six years. The official launch of a Strategic Defense Initiative (SDI) by the Reagan administration in March 1983, which at the time promised to take U.S. missile defense capabilities to a whole new technological level, had further contributed to the Soviet decision to leave the INF talks. From the Soviet perspective, SDI threatened to devalue the ABM deal, opening up the prospect of U.S. strategic invulnerability and further expanding the technological lead the United States already enjoyed (Arbatov 2019). Only two years later, however, the sides again agreed to manage the issue of missile defense cooperatively, as part of their bilateral arms control process. A new tripartite negotiation formula to address INF-range weapons, strategic offensive weapons, and missile defense separately would ultimately lead to two outcomes: the INF Treaty and START I.

2.3 The START process and the PNIs

On July 31, 1991, Gorbachev joined Reagan's Republican successor, George H. W. Bush, in signing the START I agreement, which for the first time led to

mutual reductions in strategic nuclear arms. START I devised an aggregate limit of 6000 warheads and 1600 delivery vehicles each, plus additional sub-limits for the nuclear triad (Congressional Budget Office 1991). In addition, both sides included data and certain kinds of telemetry exchange, on-site inspections, and monitoring of ICBM production sites in the extensive verification protocol. The duration of the Treaty was set for fifteen years.

The deep reductions devised by START I reflected benevolent bilateral political relations against the background of the peaceful end of the Cold War. At the same time, the parties' willingness to shield the START process from political disruptions endured even the massive shifts of power that came with the dissolution of the Warsaw Pact and the breakup of the Soviet Union. These disruptions nevertheless had political knock-on effects that would complicate the entry into force of START I. After difficult negotiations, Ukraine, Belarus, and Kazakhstan became non-nuclear-weapons states under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), thereby transferring all Soviet nuclear arms to Russia. Ukraine gained additional negative security guarantees by Russia, the United States, and the United Kingdom in the 1994 Budapest Memorandum. Respect for Ukraine's territorial integrity was among these guarantees. As a result of the back and forth between Kyiv, Moscow, and Washington, START I only entered into force on December 5, 1994, with a three-year delay. President Bush's START policy could build on broad domestic bipartisan support, which was underscored by the fact that his successor, the Democrat Bill Clinton, would go on to secure the necessary two-thirds majority for the Treaty's ratification by the U.S. Senate (Cirincione 2007). In terms of the impact of the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities, the START process benefitted additionally from the fact that U.S. missile defense policies were scaled back. Under Bush, the SDI program was cut back and renamed Global Protection Against Limited Strikes (GPALS)—a project that was ultimately terminated by Clinton. At the same time, it was also Clinton who ensured that U.S. development of missile defenses would continue under the re-named Ballistic Missile Defense Organization (BMDO).

The same year that START I was signed, U.S. President Bush announced the unilateral withdrawal of thousands of U.S. tactical nuclear weapons (TNWs) from Europe and East Asia in what would become known as the first step of the Presidential Nuclear Initiatives (PNIs). A few weeks later, Gorbachev responded with similar steps aimed at reducing the number of Soviet TNWs. In early 1992, after the breakup of the USSR, the new Russian President Boris Yeltsin reaffirmed Russia's commitment to the PNIs and added additional measures. The Initiatives were special in that they were voluntary, unilateral, non-verifiable, and therefore not subject to a (potentially complicated) negotiation or ratification process in Moscow and Washington. Despite their non-verifiability, the PNIs proved to be politically significant. Estimates suggest that they led to the withdrawal of 17,000 TNWs from service (Faust 2021, p. 132), with some weapons categories, such as U.S. ground-launched TNWs, being eliminated entirely.

Both sides' willingness to shield the Initiatives against political disruptions was as strong as it had been in the START process. Yeltsin himself took the Initiatives further, despite the turmoil in the collapsing Soviet Union. Support for the PNIs

at the U.S. domestic level was also high, particularly since President Bush had made the reduction of Soviet TNWs an urgent priority against the background of the failed August 1991 coup against Gorbachev and U.S. fears of "loose Soviet nukes" (Koch 2012). In terms of the impact of the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities, the U.S. Senate vote against funding new U.S. missiles in order to save money (ibid.) helped to create an environment in which both sides could reengage on ballistic missile defense. The Yeltsin–Bush PNI of 1992 contained a short reference to "the U.S. proposal for limiting non-nuclear ABM systems." Half a year later, a U.S.-Russian high-level group formed, known as the Ross-Mamedov Talks to explore President Yeltsin's proposal for the establishment of a joint Russian–U.S. global anti-ballistic missile system (Shoumikhin 2002).

Only a year later, both sides complemented START I by attempting to establish further, lower limits on strategic nuclear weapons in a START II agreement. The Treaty would have reduced the number of deployed strategic nuclear warheads to 3000–3500 for each party. Even though the Treaty was ratified by the U.S. Senate in 1996, a number of factors contributed to its ultimate failure.

In terms of each side's willingness to shield arms control from political disruptions, the mid to late 1990s saw a number of developments that began to overshadow the relationship. Most prominently, NATO's eastward enlargement and the U.S. military intervention in Kosovo prompted strong concerns in Moscow about the uncertain effects of U.S. global dominance (Baranovsky 2000). At a 1997 bilateral summit, Yeltsin called "the eastward expansion of NATO [...] a mistake and a serious one at that" (quoted in Lippman 1997). Even though Yeltsin and Clinton expressed an interest in shielding the START process, differences in general bilateral relations made it increasingly difficult (Talbott 2003). At the same time, partisan politics began to dominate the domestic discourse on America's arms control and nonproliferation policies in Congress. A Republican-led Senate challenged the Clinton administration on a number of arms control topics, most prominently when the chair of the powerful Senate Foreign Relations Committee, Jesse Helms, opposed the ratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) in 1998 (Cerniello 1999). The Senate voted on the Treaty in October 1999 and rejected it. In terms of the impact of the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities, the horizontal diffusion of medium- and long-range missiles throughout the 1990s, particularly by North Korea, Iran, and Iraq, began to additionally affect the START process. Defending against these so-called "rogue states," U.S. Republicans in Congress called for the deployment of a National Missile Defense (NMD) system by 2003 (Hildreth 2007). In Moscow's view, however, the argument of global horizontal missile proliferation was being used by the United States as a cover to do away with the ABM Treaty (Shoumikhin 2002). The Clinton administration's decision to abandon the Ross-Mamedov Talks despite continued Russian interest (Shoumikhin 2002) further contributed to these disagreements. The conclusion of the U.S.–Russian Demarcation Agreement in 1997, which devised limits and rules for theater missile defense (TMD)—i.e., below strategic ranges—testing and deployment in order to ensure the continued viability of the ABM Treaty, could only temporarily lift the pressure that continued U.S. interest in

the development of TMD had exerted on the bilateral arms control agenda. When, due to mounting domestic pressure, the Clinton administration proposed that the ABM Treaty be amended to open the door to NMD, the reaction from Moscow was negative. On March 18, 1999, an official Russian statement warned that the pursuit of NMD would pose "a serious threat to the whole process of limiting nuclear weapons and to the stability of a strategic situation which has taken decades of international agreements to build up" (quoted in Jamestown 1999). In Moscow's view, "the ABM treaty and the START treaties are two component parts of one whole" (ibid.). Accordingly, Russia made it clear to Washington that it would withdraw from the START agreements if the United States were to deploy an NMD system.

It was against this complex background that a third START accord, foreseen by the 1997 START III "Framework Agreement" and envisioning reductions in aggregate levels of strategic nuclear warheads to 2000–2500 per side, never came into being. Even though the Russian Duma ultimately ratified START II, the U.S. Senate's failure to ratify the Demarcation Agreement and the United States' subsequent exit from the ABM Treaty, which took effect in June 2002, prompted Moscow to announce that same year that it no longer viewed itself as bound by its START II obligations. With that, the original START process had come to an end.

2.4 The impact of the three factors

With this summary of the contractual milestones of almost thirty years of U.S.–Soviet/Russian nuclear arms control in hand, it is clear that this process was anything but linear. Instead, it involved interruptions and episodes of regression that help to put the current nuclear arms control crisis into perspective. Taking a closer look at the impact of the three key factors during this period, a number of findings emerge.

First, both sides' willingness to shield bilateral arms control from political disruptions, including instances of non-compliance, and deteriorating general bilateral relations varied. All instances of contractual engagement, including periods of prolonged negotiation, were fraught with ongoing or acute political disruptions to various degrees—whatever the state of general bilateral relations. These disruptions did not necessarily lead to an abrogation of negotiations or failed agreements, however. Sometimes they did, as in the case of SALT II, and sometimes they did not, as in the case of START I and the PNIs. It is therefore impossible to pinpoint exact instances where this first factor alone contributed to the success or failure of bilateral arms control. In addition, Russian non-compliance did not have a significantly negative long-term impact on the process during the period under analysis.

Second, and less surprisingly, bipartisan domestic support strengthened U.S. arms control policies and had a positive impact, whereas partisan politics complicated or hampered the pursuit of arms control, such as during the late 1990s. An interesting detail in this regard is that it was mainly those Republican U.S. administrations that could build on Democratic domestic support that succeeded in forging arms control agreements with Moscow. Another finding is that domestic opposition to bilateral arms control from the ranks of Republicans increased during the second half of the 1990s.

Third, the vertical diffusion of technologically novel defensive and offensive missile capabilities had a distinctly negative impact whenever one side was under the impression that a new system would give the other a significant advantage. This was clearly the case in the U.S. debate on a "window of vulnerability" and its impact on SALT II and the early INF process, on the one hand, and with the Russian reaction to the launch of SDI, on the other. Whenever both sides were able to find *quid pro quo* formulas or to trade issue areas in order to address the perceived (dis)advantages of vertical diffusion, however, as occurred with SALT I and the tripartite negotiation formula that paved the way for the INF Treaty and START I, arms control was successful. Washington's increasing interest in missile defense in the second half of the 1990s also played a central role in ending the original START process. Finally, the horizontal diffusion of technologically novel offensive missile capabilities (i.e., to third states) began to seriously affect the bilateral process only after the end of the Cold War. Its impact became all the more significant the more horizontal diffusion was used as a justification for U.S. policymakers to take missile defense off the bilateral arms control agenda.

Fourth, no factor alone can explain the success or failure of bilateral arms control, which has always relied on the positive convergence of all three factors to secure success. As an inverse example, despite a general interest in both Washington and Moscow to shield the bilateral process, negative developments towards the end of the 1990s at the U.S. domestic level and the level of horizontal diffusion led to the failure of START II and III.

3 Twenty years of crisis (2001–2021)

This second section focuses on the twenty years of crisis in bilateral nuclear arms control from 2001 to 2021, breaking it down into three periods: (1) the end of the ABM Treaty and the conclusion of the Strategic Offensive Reductions Treaty (SORT) agreement; (2) a longer interim period of deteriorating bilateral general relations, which nevertheless brought about New START; and (3) a period of rapidly deteriorating arms control relations during the presidency of Donald J. Trump. For each period, changes to the three factors are highlighted in order to demonstrate the extent to which the current crisis is unique compared to earlier episodes of arms control regression.

3.1 The end of the ABM treaty and the conclusion of SORT

When U.S. President George W. Bush entered office, the deployment of missile defenses became a key U.S. national security objective (Congressional Research Service [CRS, 2010]). In addition to increased funding for missile defense programs, Bush announced the United States' exit from the ABM Treaty on December 13, 2001, which took effect in 2002. According to the U.S. Congressional Research Service, "[t]he Bush Administration's argument for abrogating the ABM Treaty centered around a different strategic environment from 1972 when the Treaty was signed: Soviet forces no longer threatened the United States and the greater threat

came from the proliferation of ballistic missiles and weapons of mass destruction from other countries. Special concern was focused on rogue states and terrorism in the wake of 9/11" (ibid., p. 16). Only a month before the end of the ABM Treaty, the parties had signed the SORT. This agreement, which also became known as the Moscow Treaty, entered into force in 2003 and obligated both parties to reduce the number of its deployed strategic offensive arms to 1700–2200 warheads each while maintaining their freedom to decide on the composition of their strategic forces. SORT contained no verification provisions at all and did not even specify which warheads were to be reduced or how reductions were to be made (Arms Control Association 2017). It was to remain in force until the end of 2012.

In terms of both sides' willingness to shield bilateral arms control from political disruptions, including instances of non-compliance, and deteriorating general bilateral relations, 2002 reflected a very mixed picture. On the one hand, both sides were able to conclude a new arms control agreement against the background of massive (and very much ongoing) political disruptions, such as the 9/11 attacks, the start of the U.S. war on terror, and the subsequent open Russian disagreements with President Bush's Iraq policy. Even though SORT could not live up to the qualitative level of the previous bilateral agreements, concluding the agreement reflected a rather pragmatic approach to arms control (Shoumikhin 2002). On the other hand, SORT was simultaneously influenced by the fact that the United States was no longer willing to continue to shield the crucial defensive capabilities—addressing part of the bilateral arms control agenda. This development should be seen in conjunction with the long-term effects of the end of the Cold War. Having survived and won the bloc confrontation against a competing system which collapsed soon thereafter, the United States no longer faced an equivalent international power or commensurate threat (Wertheim 2020). The resulting system of unipolarity led to a diminished interest on the part of segments of the U.S. political establishment to secure survival by means of bilateral arms control. Neoconservative policymakers from the Republican Party in particular no longer saw added value in restraining critical elements of U.S. military power cooperatively with Russia (Böller 2021), at least not as long as those restraints prevented the United States from fielding a national missile defense system. As a long-time observer of U.S. foreign policy noted back in 2001, "the philosophy and practice of traditional arms control [were] no longer contributing effectively to the goal of reducing threats to U.S. national security" (Sokolsky 2001, p. 4). Former U.S. Ambassador to Russia Michael McFaul noted back in 2003 that "Bush could threaten to withdraw unilaterally from the ABM Treaty [...] because Russia was too weak to do anything about it" (Goldgeier and McFaul 2003, p. 312). This was certainly true; by 2001, Russia had seen a decade of continuous economic and military decline.[5] It was no longer a peer competitor of the United States, and its interest in upholding the arms control architecture in order to keep the U.S. nuclear

[5] A few figures help to illustrate this shift in power. Between 1990 and 1999, the gross domestic product (GDP) of the Soviet Union/Russia, measured in current U.S. dollars, fell from 516 billion to 195 billion (The World Bank 2021). During the same period, the U.S. GDP rose from 5.9 trillion to 9.6 trillion. The overall trend of Russian military expenditures (measured in current U.S. dollars) between 1993 and 1999 was negative and fell from 7.7 billion to 6.4 billion (ibid.). While the U.S. trend during the same period was also negative, U.S. military expenditures fell from 316 billion to 298 billion (ibid.).

arsenal in check was met with less and less enthusiasm in Washington (Shoumikhin 2002). Despite generally good bilateral relations, corresponding shifts in power and diverging interests in arms control contributed to a nascent arms control crisis and, later, in the reoccurrence of conflict between the two countries.[6]

In terms of U.S. domestic support for and opposition to bilateral arms control, President Bush could build on a bipartisan majority when submitting SORT to the Senate for advice and consent, after agreeing to requests from leading U.S. policymakers to make the agreement legally binding. Meanwhile, the ABM Treaty's demise had been ensured by conservative U.S. lawmakers who were overwhelmingly opposed to continuing with the same bilateral arms control agenda that had been pursued in the 1990s. As mentioned in the previous section, the Republican-dominated U.S. Senate of the late 1990s had already worked against the arms control agenda of the Clinton administration on a number of occasions (Böller 2021). As the last Director of ACDA remarked with frustration in 1998: "We [...] have internal divisions, which seem to turn virtually every element of our policy into a monumental struggle—whether ratification of a treaty like the comprehensive test ban, or engagement on non-proliferation with a country like China, or sufficient funds to pursue effective diplomacy, or anything else" (Holum 1998). One of the favorite Republican targets was ACDA itself. Republicans like Helms, who claimed credit for ACDA's demise in 1997, knew that without this independent agency future U.S. arms control policies would have a much weaker standing in the interagency process (Keeny 1998).[7] Meanwhile, the Democrats—traditionally more opposed to missile defense programs—gave in and accepted the Republicans' insistence on NMD. By the turn of the millennium, the domestic balance of power on missile defense had finally tilted towards the Republicans, triggering "a cataclysmic break in U.S.-Russian relations" (Goldgeier and McFaul 2003, p. 312).

Finally, in terms of the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities in the coming absence of the ABM Treaty, Russia "wanted [SORT] to contain a statement noting U.S. missile defenses would not undermine the effectiveness of Russia's offensive forces" (Woolf 2011), which the United States refused. The background to this refusal was National Security Presidential Directive 23, signed by President Bush in December 2002, which outlined a plan to begin deploying novel operational U.S. ballistic missile defenses by 2004, including at a European site close to Russian territory (The White House 2002). Two developments influenced this decision. First, countries hostile to the United States such as North Korea, Iran, and Iraq had made considerable progress in their missile capabilities, which threatened U.S. regional allies and made it at least conceivable that the U.S. homeland might also be put at risk at some point were those technological advances to continue uninterrupted in the future (CRS

[6] The latest research has once more highlighted that particularly stark shifts in power seldom take place in a nonconflictual manner (Shifrinson 2018). According to Russian scholars, at least three factors contributed to the worsening of the West's relationship with Russia: NATO enlargement (Baranovsky 2000), the kleptocratic and authoritarian domestic system in Russia (McFaul 2020), and Moscow's quest for respect on the international stage (Götz 2016).

[7] In 1997, the Clinton administration sacrificed ACDA to secure a Senate vote on the Chemical Weapons Convention (Keeny 1998).

2010). Against the latter projection, proponents of NMD argued that a more modest U.S. missile defense system for the continental United States defending against only a few incoming missiles would have sufficed. Second, despite repeated technical setbacks, the limited U.S. missile defense program of the 1990s was expected to start delivering on that goal (ibid.: 14–16). By December 2004, five ground-based interceptors in silos in Alaska for a limited NMD system against long-range missiles were initially deployed. The system's operability remained contested, however (ibid.).

3.2 The interim period

The end of the ABM Treaty and the conclusion of SORT in 2002 was followed by a 14-year interim period, which ended with Donald J. Trump's election as president in 2016. After 2002, it took eight years for Washington and Moscow to agree on their next, and thus far their last, bilateral pact to cooperatively control their nuclear arsenals. On April 8, 2010, Presidents Barack Obama and Dmitry Medvedev signed the New START agreement, which replaced SORT after START I had expired in December 2009. The new agreement was again legally binding and came with detailed verification and compliance mechanisms, limiting each side to 1550 deployed strategic warheads and setting an aggregate limit of 800 for deployed and non-deployed systems of the nuclear triad. The Treaty has a duration of ten years and can be extended once for a period of five years, an option chosen by the incoming Biden administration in February 2021.

In terms of both sides' willingness to shield bilateral arms control from political disruptions, including instances of non-compliance, and deteriorating general bilateral relations, the negotiation and conclusion of New START took place against the background of a short pause in bilateral disagreements, epitomized by the Obama administration's desire to "reset" general bilateral relations. The previous years had seen Russia regain some of its economic and military strength and begin to reinvest in its outdated military, including in the nuclear realm.[8] This trend was coupled with a more aggressive Russian stance towards conflictual relationships in Russia's direct neighborhood, including NATO's continued enlargement and the 2008 war between Russia and Georgia. Political conflicts with the United States over these events and America's Middle East policies had increased steadily prior to New START. Despite these general political differences, both sides were able to conclude New START in 2010, returning to the previous arms control bilateralism of meticulously negotiated, legally binding, and intrusively verifiable strategic nuclear reductions. The following years brought even more serious political disruptions and disagreements—from the West's intervention in Libya in 2011 over the Russian protests that same year to the 2012 release of the White House's "Pivot to East Asia" regional strategy (Davidson 2014), which clearly underscored that America was going to play a leadership

[8] Between 2000 and 2013, the Russian economy grew from a GDP of 259 billion to 2.29 trillion U.S. dollars. Likewise, Russian military expenditures (measured in current U.S. dollars) grew from 9.2 billion in 2000 to 88.3 billion in 2013. After 2013, both trends reversed, and Russian GDP and military expenditures dropped (The World Bank 2021).

role in Asia for the next decades.[9] These disruptions peaked when Russia illegally annexed Crimea in 2014, thus violating Ukraine's territorial integrity, which Russia had guaranteed in the 1994 "Budapest Memorandum" (Yost 2015). That same year, the Obama administration had publicly claimed that Russia had violated the INF Treaty by flight testing a GLCM at ranges forbidden by the Treaty (CRS 2019). At their 2016 Warsaw Summit, NATO allies agreed to set up a so-called "trip wire" force in the three Baltic States and Poland to deter Russia from waging a potential land grab in Eastern Europe. Long-term observers of the bilateral relationship saw the beginning of a "New Cold War" (Legvold 2014). All this notwithstanding, both sides remained willing to shield the implementation of New START, which continued uninterrupted.

At the same time, securing bipartisan U.S. domestic support for bilateral arms control became increasingly difficult during the Obama years. Despite repeated statements by multiple high-ranking leaders of the U.S. military confirming that ratifying New START would be in the security interest of the United States, it took ten months for the Treaty to be ratified, following extensive debate in the U.S. Senate (Fey 2012). The fervor with which Republican Senators worked against the ratification of the New START agreement in 2010 cannot be explained by their diverging views on national security, given the parade of high-ranking U.S. military leaders and former GOP grandees who testified before Congress that the Treaty would be in the United States' national interest (U.S. Senate 2010). Even though the political showdown was also about extracting massive financial concessions from the Obama administration in order to fund the modernization of the U.S. nuclear weapons complex (Fey 2012), Republican hostility towards arms control agreements negotiated by Democrats became an evident long-term trend that would extend well beyond President Obama's two terms in office. The other domestic trend—continued loss of Republican interest in arms control—predates the Obama presidency and explains the weak SORT agreement, which had been caricatured as "the shortest disarmament treaty in history" (Müller and Schörnig 2006, p. 172), and Republican hostility towards ratifying the CTBT.[10] Both domestic trends stand in sharp contrast to previous decades, when Republican and Democratic administrations had cooperated when necessary to restrain the Soviet Union (and later Russia) through arms control. Both trends had a negative effect on the bilateral nuclear arms control relationship.

In terms of the impact of the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities, the further U.S. pursuit of missile defenses against growing missile threats from North Korea and Iran continued to have a negative impact on the bilateral arms control agenda. In September 2009, President Obama launched the European Phased Adaptive Approach to missile defense against missile threats from Iran, thereby replacing the previous Bush program.

[9] This policy shift was largely triggered by China's unparalleled economic growth. Between 2000 and 2013, the Chinese economy grew from a GDP of 1.2 trillion U.S. dollars in 2000 to 9.5 trillion U.S. dollars in 2013. This trend continued in the following years. By 2020, the Chinese GDP had reached 14.7 trillion U.S. dollars (The World Bank 2021).

[10] In his first year in office, George W. Bush publicly declared that the CTBT "was not in the interests of U.S. national security and therefore off the agenda" (CTBTO 2012).

Washington sought to reassure Moscow that the system would not be capable of interfering with Russia's strategic deterrent (Sankaran 2015). Moscow, however, failed to achieve a legally binding mechanism to constrain U.S. plans via the New START agreement. In the end, it signed and ratified New START. Nevertheless, a unilateral Russian statement attached to the Treaty stated that, from Russia's perspective, New START "may be effective and viable only in conditions where there is no qualitative or quantitative build-up in the missile defense system capabilities of the United States of America" (Russian Federation 2010). According to Steven Pifer, a former U.S. arms control official:

> [t]he Obama administration regarded a legal guarantee on missile defense [as requested by Russia] as a non-starter. It would have to be recorded in a treaty, requiring Senate ratification. As had been made clear during the 2010 ratification debate over New START, anything that looked even remotely like limits on missile defense had zero chance of gaining Senate ratification. U.S. officials told their Russian counterparts that the United States was prepared to offer a political assurance that U.S. missile defenses were not directed against Russia and to put it in writing, signed at the highest level. They made clear that they could not conclude a legally-binding agreement to limit missile defense. (Pifer 2012, p. 14)

By 2010, missile defense had become a persistent element of U.S. security policy. Its pursuit was characterized by an uncompromising stance vis-à-vis Russia and was treated as "non-negotiable" in domestic U.S. politics. In parallel to the continued vertical proliferation of U.S. missile defense programs, which went hand in hand with the horizontal offensive missile proliferation by third actors such as the nuclear-armed North Korea and Iran, Washington also increased its efforts regarding the vertical diffusion of novel offensive missiles. From 2001 onwards, the U.S. Congress earmarked a rapidly growing budget for research and development of conventional long-range precision munitions such as novel cruise missiles and hypersonic glide vehicles—a development that would soon be met by similar Russian programs (Woolf 2020, p. 27).

3.3 The Trump years

The latest period of ongoing crisis in bilateral nuclear arms control has thus far taken place under the four-year leadership of Donald J. Trump. In terms of both sides' willingness to shield bilateral arms control from political disruptions (including instances of non-compliance) and deteriorating general bilateral relations, America's shifting focus on China has increasingly affected Washington's nuclear posture, with negative knock-on effects on the bilateral nuclear arms control relationship. The 2018 U.S. National Defense Strategy described China as a "strategic competitor using predatory economics to intimidate its neighbors while militarizing features in the South China Sea" (U.S. Department of Defense 2018b: 3). This was a significant step further than the Obama administration's "pivot" policy. Closing a perceived gap in regional sub-strategic deterrence vis-à-vis China and Russia, the Trump administration mandated the development and deployment of new nuclear

weapons on U.S. nuclear submarines (U.S. Department of Defense 2018a). Meanwhile, continued Russian non-compliance with the INF Treaty, made public by the previous Obama administration, vividly underscored the extent to which Moscow was also increasingly unwilling to shield the crucial INF element of the bilateral nuclear arms control relationship. In 2019, Washington decided to pull out of the INF Treaty instead of continuing to work behind the scenes to bring Russia back into compliance. Again, China featured in this decision. In an op-ed from 2014, John Bolton, later National Security Advisor to Trump, argued that INF was unnecessarily constraining U.S. military options in East Asia while giving China a free hand (Bolton and Yoo 2014). In October 2018, Trump remarked that "China is not included in the agreement. They should be included in the agreement" (quoted in Hurd and Chachko 2018). It was clear that it was not only Russian non-compliance that had motivated the U.S. administration to give up on INF. This "China angle" of Trump's destructive arms control policy also interfered with the negotiation process with Russia on extending New START for another five years. In June 2020, Marshall Billingslea, U.S. special envoy for arms control, explained that Washington was "willing to contemplate an extension of [New START] but only under select circumstances," which included progress toward a trilateral arms control agreement that would involve China (quoted in Reif and Bugos 2020).

In terms of U.S. domestic support for and opposition to bilateral nuclear arms control, Republican loss of interest in and hostility towards previously concluded arms control agreements writ large became a signature brand during the Trump years. In addition to the INF Treaty, the Trump administration targeted the Obama administration's Iran nuclear deal, dropped out of the Arms Trade Treaty negotiated by the Obama team, watered down the regulations on drones under the Missile Technology Control Regime, and exited the Treaty on Open Skies, a transparency and verification instrument that had been of particular value to European allies of the United States. Opposition to this policy came exclusively from Democrats, whereas Republicans in Congress overwhelmingly backed Trump's course (Böller 2021).

Finally, in terms of the impact of the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities, the Trump administration only continued the missile defense programs it had inherited. In 2018, however, Russian President Vladimir Putin unveiled a number of what he saw as new strategic second strike weapons. His justification referred directly to the ABM Treaty: "During all these years since the unilateral U.S. withdrawal from the ABM Treaty," he told the Russian audience, "we have been working intensively on advanced equipment and arms" (quoted in Lewis 2021). The logic behind vertical offensive diffusion seems to go beyond the ABM Treaty and Russian concerns about U.S. attempts to seek strategic invulnerability. Some of the novel Russian missiles, such as the Avangard hypersonic glide vehicle and the air-launched Kinshal missile, would seem to mirror U.S. long-range precision strike programs such as the Bush-era Prompt Global Strike, providing the Russian military with more strike options for global, rapid, high-precision engagement. The assumed development and integration of a new ground-launched cruise missile (the Russian INF-busting 9M729), by contrast, has been interpreted as a Russian reaction to the horizontal diffusion of

missiles with intermediate ranges in countries along its periphery, including North Korea, China, India, and Pakistan (CRS 2019, p. 24).

3.4 Changing factors

Seen through the lens of the three central factors that have contributed to the success and failure of bilateral nuclear arms control, it is clear that the degree to which these factors have changed and interacted in the period from 2001 to 2021 has contributed heavily to the crisis in bilateral nuclear arms control, making it unique compared to earlier episodes of arms control regression.

First, a number of changes occurred regarding both sides' willingness to shield bilateral arms control from political disruptions, including instances of non-compliance, and deteriorating general bilateral relations. In the first two decades of the new millennium, and despite their deteriorating general relations, Washington and Moscow remained willing to continue controlling their strategic offensive arms, as demonstrated by the SORT and New START agreements. Their willingness to shield the bilateral arms control process *in its entirety* dissipated, however. Below the strategic ranges, both seem to have developed an interest in new intermediate-range missiles. In terms of the process's defensive component, Washington was pulling ahead with its missile defense programs. This departure from previous times was epitomized by the United States' unwillingness to shield the ABM Treaty and by both side's unwillingness to shield the INF Treaty. Concerning the latter, as described in the first section, Moscow had cheated on arms control agreements in the past. Back then, however, both sides had been able to find ways to solve their differences at the technical level of experts. By the mid-2010s, this approach was no longer working—at least not when it came to the INF Treaty.[11] In addition, other instances of Russian non-compliance also affected further agreements. In conjunction with the Ukraine crisis, Moscow violated the security guarantees it had extended to Ukraine under the Budapest Memorandum. Some U.S. experts have also questioned Russia's continued adherence to the PNIs (Woolf 2021, p. 15). The consistency with which Moscow has both openly and secretly violated key arms control agreements in the past twenty years is yet another departure from earlier days. Finally, this fading willingness to shield bilateral nuclear arms control was reinforced by China's emergence as a peer (military) competitor of the United States, which marked a structural departure from previous times. For Washington, China's rise makes it tempting to either forego arms control for tactical advantages—with the Trump administration's exit from the INF Treaty as a possible case in point—or to seek arms control in order to cement military advantages vis-à-vis Beijing, thereby potentially losing the remaining offensive strategic component of the arms control process with Moscow.

Additional changes have also affected the domestic factor. The first is the U.S. political establishment's growing inability to find common ground on arms control policies. Again, diverging views between Republicans and Democrats had periodically overshadowed or interrupted Cold War arms control relations, e.g., during the

[11] Despite repeated calls by various governments, Russia did not provide any hard evidence against the United States' claim that it had failed to comply with the INF Treaty in order to save the agreement.

Carter presidency. Today's inability to compromise, however, has become a structural impediment to arms control and has made it almost impossible for the current administration (and indeed for future administrations) to conclude legally binding arms control agreements that would pass the test in the U.S. Senate. The scrupulousness with which Trump officials dismantled the treaty-making legacy of President Obama—not just in the arms control realm—shows that Republican hostility towards Democratic arms control is now an entrenched feature of U.S. politics. In addition, the GOP's turn away from arms control marks a distinct departure from the Cold War-era administrations of Presidents Nixon, Reagan, and Bush Senior, who had valued arms control for its contribution to U.S. national security. U.S. agreement-making power during and shortly after the Cold War had rested to a large degree on Republican shoulders. George W. Bush was the first Republican President since Richard Nixon not to have a dedicated interest in arms control with Moscow. It took twenty years after the signing of START I for another verifiable nuclear arms reductions treaty, New START, to enter into force in 2011. Since 1991, no verifiable nuclear arms control agreement with Moscow has been negotiated and brought into force by a Republican administration. The main change to the domestic factor in the new millennium did not concern topic-specific differences between Republicans and Democrats over missile defense or quarrels over the political vs. legal stipulations of SORT, however. Instead, it occurred at the level of narratives, according to which GOP lawmakers argued that bilateral arms control *per se* had outlived itself and was no longer in the security interest of the United States (see Sololsky 2001; Böller 2021; Krepon 2021).[12]

Finally, significant changes to the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities have taken place in complex and reinforcing ways. The horizontal diffusion of offensive missile capabilities by third states following the Cold War had revitalized U.S. efforts to field tactical and strategic missile defense systems, ultimately leading to the end of the ABM Treaty. The demise of the Treaty in turn resulted in the long-term consequence of the vertical diffusion of novel offensive missile capabilities by Russia. This multi-level game, involving more than the two classical actors, was a departure from earlier times. Another significant difference is the extent to which the uncompromising pursuit of U.S. missile defense policies has negatively affected the bilateral arms control relationship. The development of different missile defense programs with different characteristics by both sides has always had an impact on the bilateral process (Schelling 1985). The demise of the ABM Treaty, however, finally toppled one of the foundations on which the bilateral contractual pursuit of stability had rested over the decades. It opened the floodgates to the theoretical pursuit of unlimited ballistic missile defense programs—whether or not they were technically feasible, likely to be successful, or affordable—and raised serious concerns about the longevity of the condition of mutual vulnerability in Moscow, and increasingly in Beijing (Warrick 2021). In addition, the absence of a means of keeping missile defenses in check has

[12] This change went beyond bilateral nuclear arms control and negatively affected the European conventional arms control domain with Russia. See the corresponding article by Alexander Graef in this special issue.

effectively deprived the bilateral arms control process of a mechanism for treating defensive capabilities as "objects of trade" in future nuclear negotiations.

4 Consequences of the crisis

As concluded in the previous section, the current crisis in bilateral nuclear arms control is unique from a comparative historical point of view. It shows a degree of seriousness that justifies the dramatic descriptions found in the recent arms control literature (Krepon 2021; Brooks 2020; Trenin 2020; Arbatov 2019; McGraw Olive 2019; Neuneck 2019). Although the full consequences of a protracted crisis remain unclear at this point, certain political developments in the recent past may foreshadow a number of unpleasant future developments. Building on the changes identified in the previous section, this final section will consider three possible future consequences of a protracted crisis. These are: (1) trilateral arms racing between Washington, Moscow, and Beijing; (2) political pressure to pursue less formal and less intrusive forms of arms control; and (3) the erosion of the global nonproliferation regime. As this section will show, these consequences can work both ways: they can either exacerbate the existing crisis or contribute to alleviating it.

4.1 Arms racing

This may be particularly true as regards the possibility of renewed arms racing. As shown in Sect. 1, bilateral nuclear arms control has at times contributed to halting and even reversing the Cold War arms race dynamics. It is therefore not far-fetched to conclude that without some of the critical constraints put in place by bilateral nuclear arms control arrangements such as the INF Treaty or the ABM Treaty, arms racing could once again become a possibility.

The first signs of a possible arms race between Moscow and Washington became evident during President Putin's 2018 speech scolding Washington for its withdrawal from the ABM Treaty (Lewis 2021). Some experts saw Putin's announcement that Russia would develop and field a range of novel missiles as an indication that arms racing had already returned (Kimball 2018; Schlosser 2018). Thus far, Washington has yet to respond to Russia's vertical diffusion of novel offensive missiles with similar new military programs. The beginning U.S. nuclear force modernization cycle, however, may provide ample opportunity for proponents of a tit-for-tat strategy to make their points, including in defense of further expanding U.S. missile defense programs (e.g., Kroenig, Massa and Trotti 2020). Further complicating things, a possible future arms race is not guaranteed to remain bilateral. Revelations in 2021 that China had secretly been building two large additional ICBM launching fields in its most westerly territories and had tested a novel hypersonic glide vehicle have triggered various reactions in Washington (see, e.g., Pomper and Santoro 2021), with some arguing that the United States and China were "stumbling into an arms race that is largely driven by U.S. investments and missile defense" (Warrick 2021). If that were true, the United States' decision to exit the ABM Treaty would also

have increased arms race pressure on China, which still commands a much smaller strategic nuclear arsenal than the United States or Russia.

An additional area in which U.S.–Chinese arms racing could take place is in the ranges below New START. As already argued, the United States' decision to exit the INF Treaty likely had less to do with immediate concerns about Russian military advantages in Europe than with China's vertical diffusion of land-based intermediate-range weapons, which can target U.S. naval forces in the South China Sea (Zhao 2020). Following the dissolution of the INF Treaty, the U.S. military was quick to launch different INF-range development programs—a move that could incentivize China, and perhaps Russia, to further increase their ongoing efforts (Arms Control Association 2019).

In any case, without some of the constraints of bilateral nuclear arms control, managing a three-pronged arms race will demand an extremely complex level of diplomacy and may even be impossible as long as Washington is unwilling to reengage diplomatically on the missile defense component of its strategic forces (Lewis 2021). In the end, however, expensive arms racing could provide financial incentives to return to arms control.

4.2 Informality

Unfortunately, both sides will probably be unable to achieve the same level of formal negotiated outcomes as those achieved during the Cold War. The increasing inability of the U.S. political establishment to find common ground on arms control, coupled with the volatility of the U.S. political system and Russia's often non-compliant behavior, could force the United States to pursue less formal agreements than those made in the past (Lissner 2021). The verification-rich, detailed treaties that required the formal advice and consent of the U.S. Senate, and that therefore rested on a broad bipartisan basis of domestic acceptance, are perhaps gone for good. A successor to New START may no longer be achievable as a legally binding treaty. As a consequence, less formal arrangements that are not legally binding and that would not entail the detailed, intrusive verification and transparency stipulations of past agreements could be one way forward for future U.S. administrations (Williams 2018; also Schelling 1985). One model could be the PNIs, as these unilateral measures rested solely on the principle of non-verifiable voluntariness. From a Russian point of view, however, legally binding agreements have often been considered the "gold standard" of arms control negotiations (Wolfsthal 2020). Whether Moscow would be willing to settle for less formal arrangements remains to be seen. At the same time, Beijing might find unilateral instruments with a low degree of transparency tempting. In any case, a strategic environment characterized by mutual accusations and increasing tensions—as is currently the case for the U.S.–Russia and U.S.–China dyads—will make it more difficult to pursue arms control policies and (re)build trust. In the early 1990s, the PNIs were only the latest step in a series of trust-building measures that had developed over years. Without the ability to forge legally binding treaties with strong verification components, it may be difficult to achieve that level of trust in the current contested strategic environment.

4.3 Erosion of the non-proliferation regime

The burgeoning arms race tendencies among Washington, Moscow, and Beijing may ultimately further weaken the NPT. The link between arms control, disarmament, and nonproliferation is an old one and is explained in depth in the article by Jana Baldus, Harald Müller, and Carmen Wunderlich in this special issue. Back in 1958, a now-declassified National Intelligence Estimate argued that "[a] U.S.-USSR agreement provisionally banning or limiting nuclear tests would have a restraining effect on independent production of nuclear weapons by fourth countries. However, the inhibiting effects of a test moratorium would be transitory unless further progress in disarmament—aimed at effective controls and reduction of stockpiles—were evident" (quoted in Cirincione 2007: 32). What was true in 1958 remains true today. Global nuclear disarmament will be less likely if the crisis of bilateral nuclear arms control continues or worsens while arms racing returns in a trilateral context. Nuclear proliferation could in turn become more likely, at least in those regions directly affected by "great power competition."

The first signs of the erosion of the NPT are already evident. In early 2021, the Treaty on the Prohibition of Nuclear Weapons (TPNW)—a consequence of a majority of NPT member states' frustration with the five NPT nuclear-weapon states' non-commitment to Article VI—entered into force (Müller and Wunderlich 2020). All five NPT nuclear weapon states, also known as the Permanent Five (P5), strongly oppose the agreement and have argued that the new instrument "contradicts, and risks undermining, the NPT" (P5 Joint Statement 2018). This fear may be warranted, should a majority of NPT Member States decide to leave the Treaty in order to give the TPNW more political clout (Pretorius and Sauer 2021). Then again, precisely this consequence could ultimately force the P5 to take their NPT disarmament obligations more seriously than they have in the past and to pursue arms control policies accordingly (Sokov 2020).

5 Conclusion

The first almost thirty years of bilateral nuclear arms control (1972–2001) saw the inception and rise of an entire process with different contractual elements that addressed both offensive and defensive strategic systems and offensive systems below strategic ranges. It sustained periods of stagnation and even regression—and thus it was not free of symptoms of crisis. The first section of this article sought to provide a concise overview of this first period of bilateral nuclear arms control, analyzed through the lens of three key factors that influenced the process: (1) both sides' willingness to shield bilateral arms control from political disruptions, including instances of non-compliance, and deteriorating general bilateral relations; (2) U.S. domestic support for and opposition to bilateral nuclear arms control; and (3) the vertical and horizontal diffusion of technologically novel defensive and offensive missile capabilities. Analysis of the influence of these factors yielded a number of findings. First, whatever the state of general bilateral relations, all instances of cooperation were impacted by political disruptions. These disruptions did not necessarily lead to

failure, however. Second, Russian non-compliance did not have a significantly negative long-term impact on the process. Third, bipartisan U.S. domestic support for arms control had a positive impact on the process and dwindled during the second half of the 1990s due to Republican opposition. Fourth, arms control was successful whenever both sides were able to address the perceived (dis)advantages of the vertical diffusion of offensive and defensive capabilities through negotiations that dealt with these different elements. Fifth, the horizontal diffusion of missile capabilities to third states seriously affected the bilateral process only after the end of the Cold War. Sixth, in order to arrive at successful outcomes, the positive convergence of all three factors was necessary. No factor alone can explain the success or failure of bilateral nuclear arms control during that first period.

The second section of this article focused on the twenty years of crisis in bilateral nuclear arms control in the period from 2001 to 2021. In order to highlight the uniqueness of the ongoing crisis compared to earlier episodes of regression, it sought to explain how the same factors that had previously contributed to the success of nuclear arms control underwent significant changes and ultimately had a negative effect on the bilateral process. Analysis of these changes elicited a number of insights. The most prominent shift concerned both sides' unwillingness to shield the bilateral process in its entirety. Instead, they purged the defensive and sub-strategic elements while keeping in place mutual constraints on offensive strategic systems. This means that both parties were only willing to shield one last element of constraints against political disruptions, including instances of non-compliance, and deteriorating general bilateral relations. Increasing acts of Russian non-compliance and the inability to deal with it constructively at the technical level mark another qualitative shift. Finally, the rise of China and increasing competition in the U.S.–China dyad has affected the bilateral arms control process, to the extent that it is no longer inconceivable that the last pillar of bilateral nuclear arms control—the offensive strategic element—could collapse in the years to come. In terms of the U.S. domestic factor, the growing inability of the U.S. political establishment to find common ground on arms control policies due to a waning Republican interest in arms control *per se* coupled with an open hostility to Democratic arms control policies marks an almost structural change and represents a distinct departure from the GOP arms control policies of the previous century. Regarding changes to the third factor, the interplay between growing horizontal diffusion in the area of offensive capabilities, increasing U.S. missile defense efforts, and modernizations to Russia's strategic offensive arsenal represent a structural shift from bilateral to multi-actor competition. In this regard, it is almost impossible to overstate the negative impact of the United States' withdrawal from the ABM Treaty as a key stabilizing element of the bilateral process. All in all, the quantitative and qualitative change across all three factors and the persistence with which these changes have continued to negatively affect the bilateral process for twenty years (and counting) make this crisis unique compared to earlier episodes of arms control regression.

The third section of this article sought to predict possible future consequences of a protracted crisis. In terms of arms race stability, the first signs of nuclear arms racing between Moscow, Washington, and Beijing are already evident, particularly in relation to the missing defensive and sub-strategic elements of the old bilateral

process. This development will make for a less secure, more costly, and perhaps more crisis-prone future. In terms of future agreements, including with China, all sides may have to live with negotiated outcomes that are less formal and less intrusive—a development that may not necessarily be bad news for arms control. Then again, a return to the "old order" of an entire process across different domains (offensive and defensive strategic forces, as well as sub-strategic capabilities) will likely be impossible should Washington be unwilling to put strategic missile defense back on the negotiation table. Finally, trilateral arms racing could further undermine the NPT, which is already under pressure from the new TPNW. This pressure could be useful, however, to the extent that it motivates the P5 to take their NPT Article VI disarmament obligations more seriously.

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