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BEYOND ARMS CONTROL: STRATEGIC STABILITY IN A MULTIPOLAR NUCLEAR ORDER

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EXECUTIVE SUMMARY

1. The global arms control order is undergoing a structural transformation as the treaty-centric regime that defined nuclear governance since the late Cold War fractures under the weight of great-power competition and technological disruption. In its place, a hybrid post-treaty regime is emerging, characterised by selective restraint and informal risk-reduction mechanisms that are institutionally novel yet analytically undertheorised.

2. Understanding this transition requires a rigorous archaeology of past failures alongside a prospective analysis of modular, norm-based governance forms capable of managing nuclear risk in a multipolar world. India occupies a uniquely generative position in this landscape, operating at the intersection of strategic realism and disarmament legitimacy as a norm entrepreneur.

3. The core of the current crisis stems from the dissolution of the New START framework, which officially expired in February 2026. Following Russia's suspension of the treaty in 2023, the inspection and notification architecture were terminated, leaving the world’s two largest nuclear arsenals without a functioning verification framework for the first time since 1972.

4. To manage this precarious state of strategic stability, a pragmatic policy agenda is required that focuses on politically binding measures rather than a total revival of the classical model. This approach seeks to manage arms racing and inadvertent escalation through a mix of modular experiments and long-term institutional reforms tailored to contemporary geopolitical realities.

5. At the bilateral and P3 level involving the U.S., Russia, and China, the most urgent priority is establishing voluntary ceilings on strategic forces. Washington and Moscow should announce parallel commitments to remain at their last treaty-notified levels for an interim period, supported by data exchanges and shadow implementation mechanisms derived from the New START template.

6. Engaging Beijing requires a creative floor-plus-ceiling formula that avoids forcing premature formal parity. Under this arrangement, China would publicly declare its intent to keep its arsenal well below U.S. and Russian levels in exchange for their reaffirmations of voluntary caps and commitments not to seek damage-limiting capabilities.

7. Finally, the agenda emphasises the immediate need to restart and extend crisis-communication arrangements. These mechanisms are essential for reducing the risk of accidental escalation and institutionalising a norm of restraint that does not rely solely on trilateral numerical equality.

CHAPTER 1
INTRODUCTION
What Is the Global Arms Control Order Now?

The global arms control order is undergoing a structural transformation: the treaty-centric, bilaterally anchored regime that defined nuclear governance from the late Cold War through the first decade of the twenty-first century has fractured under the combined weight of great-power strategic competition, technological disruption, and normative contestation. In its place is emerging a hybrid post-treaty regime characterised by selective restraint, informal risk-reduction mechanisms, and technology-driven competition, a governance landscape that is neither the cooperative arms control of the Cold War nor its absence, but something institutionally novel and analytically undertheorised. This monograph argues that understanding and shaping this emerging order demands both a rigorous archaeology of what failed and why, and a prospective analysis of the governance forms, modular, norm-based, and technology-aware, that can manage nuclear risk in a multipolar world. India, as a norm entrepreneur operating at the intersection of strategic realism and disarmament legitimacy, occupies a uniquely generative position in this transition.

1.1 The Problem: An Order Under Stress

On 21 February 2023, Russian President Vladimir Putin announced that Russia was ‘suspending’ its participation in the New Strategic Arms Reduction Treaty, the last remaining legally binding nuclear arms control agreement between the United States and Russia.[1] The announcement was not, in the formal sense, a withdrawal; Russia continued to observe the treaty’s warhead ceilings. But it effectively terminated the inspection and notification architecture that had constituted the operational core of the agreement, leaving the two largest nuclear arsenals in the world without a functioning verification framework for the first time since the SALT I Interim Agreement of 1972. With the formal expiration of New START in February 2026, the legal framework that once constrained the world’s two largest nuclear arsenals has finally dissolved. For the first time in the modern era, the U.S. and Russia are operating without a bilateral

framework to ensure transparency, leaving global strategic stability in its most precarious state since the height of the Cold War.[2]

This is not merely a diplomatic setback. It represents the terminal point of a governance trajectory that had already been severely degraded by the United States' withdrawal from the Anti-Ballistic Missile Treaty in 2002 and the collapse of the Intermediate-Range Nuclear Forces Treaty in 2019. Taken together, these three events constitute what Pifer has described as the 'dismantling of the strategic stability architecture', a sequential erosion of the treaty-embedded mechanisms through which the United States and Russia managed the existential risks of nuclear competition for over five decades.[3]

Yet the crisis of the global arms control order extends well beyond the bilateral US-Russian relationship. The Comprehensive Nuclear-Test-Ban Treaty has been in a state of enforced legal limbo since its adoption in 1996, with eight Annex 2 states, including the United States, China, India, Pakistan, and Egypt, yet to ratify, leaving the treaty's International Monitoring System operational but its prohibitions legally unenforced.[4] The Fissile Material Cutoff Treaty, first discussed in the mid-1990s, has never reached formal negotiations in the Conference on Disarmament, paralysed by linkage politics and verification disputes that reflect deeper asymmetries of strategic interest.[5] The 2022 NPT Review Conference, the first such gathering in six years, delayed by the COVID-19 pandemic, collapsed without a consensus final document, the second consecutive failure following the 2015 impasse, reflecting what Tannenwald has characterised as a 'system-wide legitimacy deficit' in the nonproliferation regime.[6]

Meanwhile, the strategic environment that any successor arms control framework must manage has grown dramatically more complex. China is engaged in the most rapid nuclear expansion in its history: the 2023 United States Department of Defence annual report on Chinese military power assessed that China had already exceeded 500 operational nuclear warheads and was on track to possess over 1,000 by 2030, with an eventual target that may reach 1,500 by 2035.[7] India and Pakistan continue to expand and diversify their arsenals against the backdrop of a structurally unresolved territorial dispute, periodic military confrontations, most recently the Pahalgam attack,

and no bilateral nuclear risk-reduction agreement beyond a minimal 2005 ballistic missile pre-notification protocol.[8] North Korea conducted its sixth nuclear test in 2017, has continued to develop intercontinental ballistic missile capabilities that can reach the continental United States, and formally declared itself an ‘irreversible’ nuclear-weapon state in its 2022 constitution, foreclosing the diplomatic pathway that had structured international engagement since the 1994 Agreed Framework.[9]

The emergence of AUKUS in September 2021, the trilateral security partnership between Australia, the United Kingdom, and the United States under which Australia will acquire nuclear-powered submarines, introduced a new category of proliferation-adjacency dispute into the NPT framework, with China and others arguing that the arrangement exploits a loophole in the Treaty’s Article III safeguards provisions, while the three partners assert full compliance.[10] The entry into force of the Treaty on the Prohibition of Nuclear Weapons in January 2021, now ratified by 70 states, has further polarised the normative landscape: nuclear-armed states and their allies uniformly reject the TPNW, while a growing number of non-nuclear states argue that it represents the legitimate fulfilment of the NPT’s disarmament mandate under Article VI.[11]

The Russia-Ukraine conflict, which entered its third year in 2024, has reintroduced nuclear signalling into European security discourse at a level unseen since the Cold War. Russia’s repeated invocations of its nuclear doctrine, including President Putin’s warning in February 2022 that interference with Russia’s ‘special military operation’ would result in ‘consequences never seen in history’, have tested the resilience of deterrence relationships and exposed the near-total absence of crisis communication mechanisms between Russia and NATO.[12] The war has also, as Kristensen and Korda have noted, accelerated nuclear force modernisation programmes across all recognised nuclear-weapon states, with the United States’ Congressional Budget Office estimating the cost of American nuclear modernisation over the next decade at $756 billion.[13]

It is against this compacted landscape of treaty collapse, multipolar nuclear expansion, normative fracture, and technological disruption that this monograph is crafted.

1.2 Conceptual Framework: Defining the Terms of Analysis

A. The ‘Global Arms Control Order’ as an Ecosystem

This monograph employs the concept of a ‘global arms control order’ to denote an analytically composite object: not merely a set of treaties, but the full ecosystem of formal and informal mechanisms through which states manage the acquisition, deployment, and potential use of weapons, particularly nuclear weapons, in ways that are collectively understood to reduce strategic risk. The order, in this notion, comprises five interacting layers:

- Legally binding treaties with embedded verification mechanisms (SALT/START, INF, ABM, NPT, CTBT);
- Multilateral institutions and standing bodies (the IAEA, the Conference on Disarmament, the NPT Review Conference, the Comprehensive Nuclear-Test-Ban Treaty Organisation);
- Verification practices, both technical (national technical means, the IMS, onsite inspection) and institutional (the IAEA’s Additional Protocol, the Standing Consultative Commission);
- Norms, taboos, and informal understandings (the nuclear non-use taboo, export control norms, the testing moratorium); and
- Informal risk-reduction mechanisms (hotlines, pre-notification agreements, Presidential Nuclear Initiatives, deconfliction channels).

This ecosystem approach draws on Hasenclever, Mayer, and Rittberger’s institutional conception of international regimes as ‘sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors’ expectations converge,’ while extending it to encompass the informal and tacit dimensions of arms control governance that regime theory has historically underweighted.[14] It also incorporates Tannenwald’s insight that normative constraints, particularly taboos, can perform governance functions in the absence of formal legal prohibition and may, in some contexts, be more durable than treaty-based constraints that depend on sustained political will for compliance and enforcement.[15]

B. ‘Classical Arms Control’ and ‘Post-Treaty Governance’

The analytical contrast that organises this monograph is between two governance modes: classical arms control and post-treaty governance. The term ‘classical arms control’ is used here in a specific and bounded sense. It refers to the mode of nuclear governance that emerged from the intellectual foundations laid by Schelling and Halperin in 1961 and was institutionalised through the SALT negotiations beginning in 1969: governance through legally binding bilateral treaties that establish verifiable numerical or categorical limits on weapons, embed inspection regimes, create standing consultative mechanisms, and generate predictability through the routinisation of compliance behaviour.[16] Classical arms control is characterised by: mutual vulnerability as a shared strategic premise; verification as an operational requirement; institutionalisation as a durability mechanism; and the bilateralisation of the US-Soviet/Russian relationship as the structural foundation of global nuclear order. ‘Post-treaty governance’ is not a synonym for the absence of arms control. It denotes, rather, a governance mode in which the treaty-centred, bilaterally anchored, verification-intensive paradigm has given way to a more fragmented landscape of unilateral commitments, minilateral coalitions, domain-specific norms, risk-reduction mechanisms, and informal restraints that together constitute a hybrid and partial substitute for the classical order. The concept draws on Eilstrup-Sangiovanni’s work on the ‘disintegration’ of international institutions, Drezner’s analysis of ‘the system worked’ dynamics in regime maintenance, and Borrie and Caughley’s examination of ‘unconventional approaches’ to disarmament that have gained traction precisely as classical pathways have stalled.[17]

C. Strategic Stability: A Working Definition

Throughout this monograph, the concept of ‘strategic stability’ is used in its classical formulation, as developed by RAND Corporation theorists of the 1950s and 1960s, and subsequently operationalised in US-Soviet arms control negotiations. Strategic stability has two component dimensions: crisis stability (the absence of incentives for either side to strike first in a crisis, because second-strike capabilities are sufficiently secure to deny advantage to the aggressor) and arms race stability (the absence of incentives to expand arsenals unilaterally because neither side can acquire a decisive advantage through numerical or qualitative superiority). Arms control, in the classical conception, served primarily to reinforce both dimensions: numerical limits constrained

arms race dynamics, while verification and transparency mechanisms reduced the uncertainty that might otherwise generate first-strike incentives in a crisis.[18]

This monograph argues that both dimensions of strategic stability are currently under stress in ways that classical arms control mechanisms are poorly equipped to address. The development of hypersonic glide vehicles, artificial intelligence-assisted command and control, and cyber capabilities with potential nuclear applications introduces new sources of instability, speed, ambiguity, and entanglement that existing treaty-based governance frameworks were not designed to manage. As Acton has argued, the 'entanglement' of nuclear and conventional capabilities at the level of command, control, and communications represents a qualitatively new form of strategic instability that requires governance tools beyond the numerical counting rules of classical arms control.[19]

1.3 Research Design

This monograph employs a structured comparative approach organised around a small number of analytically consequential cases. Rather than offering an exhaustive history, the analysis focuses on the 'strategic stability spine', the ABM, INF, and New START treaties, which served as the essential framework for managing U.S.-Russian nuclear competition. Their staggered collapse between 2002 and 2026 reveals a clear timeline of the erosion of the global security ecosystem. To provide a complete picture, the study also examines the CTBT, FMCT, and the NPT review process. These instances highlight a different crisis: the paralysis of international institutions and their inability to negotiate new agreements, leaving the global arms control order in a state of terminal decline.

India is selected as the focal study for the monograph's constructive argument for both structural and analytical reasons. Structurally, India's position in the arms control order is sui generis: it is a nuclear-armed state that has never been party to the NPT, yet has maintained a voluntary testing moratorium since 1998, accepted IAEA safeguards on a growing share of its civilian nuclear programme as a consequence of the 2008 India-US Civil Nuclear Agreement, and consistently articulated a doctrine of minimum credible deterrence that is, at least rhetorically, more compatible with the logic of

mutual vulnerability than the extended deterrence postures of the NATO nuclear-weapon states.[20] Analytically, India is selected as an instance of what Finnemore and Sikkink have called a ‘norm entrepreneur’, an actor with both the motivation and the positional credibility to advocate for new governance norms in a transitional institutional environment.[21] India’s simultaneous legitimacy as a responsible nuclear actor and its outsider status relative to the NPT framework gives it a distinctive capacity to bridge the disarmament and deterrence communities whose divergence has been one of the principal drivers of the NPT’s legitimacy crisis.

This monograph is an exercise in analytical policy scholarship rather than formal hypothesis-testing. It draws on primary and secondary sources across international security studies, international law, and strategic studies. Theoretical claims are grounded in the empirical record, but the monograph’s primary ambition is prescription, the identification of what a durable and equitable post-treaty governance architecture might look like and how it might be built, rather than theory-building in the strict disciplinary sense.

1.4 Structure of the Monograph

The monograph proceeds in seven chapters. The first three chapters are primarily diagnostic, establishing what existed and why it has failed. The middle two chapters are transitional, mapping the post-treaty landscape and analysing the technological forces driving it. The final two chapters are constructive, identifying the actors and policies through which a workable post-treaty governance architecture can be built.

Chapter 1 is the introductory chapter. Chapter 2 examines the conceptual and political foundations of classical arms control: what it was designed to achieve, what institutional logics made it possible, and what structural vulnerabilities were embedded in its success. The chapter argues that classical arms control’s remarkable achievements, the institutionalisation of mutual vulnerability, the routinisation of verification, and the embedding of stability norms in bilateral treaty practice were built on political conditions that were always more contingent than they appeared, and that the fracture lines now visible were noticeable, in hindsight, well before the breakdown accelerated.

Chapter 3 analyses the failure mechanics of treaty-based arms control across two analytical bundles: the collapse of the ‘strategic stability spine’ (ABM, INF, and New START), and the paralysis of the disarmament and nonproliferation institutions (CTBT, FMCT, and the NPT review process). The chapter identifies common mechanisms of failure across these cases, arguing that they reflect not merely the contingencies of particular political moments but structural features of the arms control enterprise, its dependence on sustained great-power cooperation, its vulnerability to compliance weaponisation, and its inability to accommodate technological disruption within treaty-based verification frameworks.

Chapter 4 maps the post-treaty governance landscape that is emerging in the absence of the classical order: a fragmented environment of unilateral commitments, minilateral coalitions, informal risk-reduction mechanisms, and domain-specific norms. The chapter develops a typology of post-treaty governance instruments, analyses the multipolarity problem that makes bilateral arms control structurally insufficient, and assesses what is lost and what is retained as the governance mode shifts from treaty-embedded constraint to flexible, informal, and partial restraint.

Chapter 5 examines the role of emerging and cross-domain technologies in driving the post-treaty transition. The chapter argues that the verification assumptions of classical arms control, countable systems, observable deployments, and predictable trajectories have been systematically undermined by technologies that introduce ambiguity, entanglement, compressed decision time, and verification impossibility. The chapter analyses these disruptions by mechanism rather than by system, generating a set of governance implications that point toward behaviour-based norms, transparency standards, and incident-prevention frameworks as the appropriate tools for managing technology-induced instability.

Chapter 6 develops the monograph’s core analytical contribution: an account of India’s distinctive structural position in the post-treaty order and its potential role as a norm entrepreneur capable of bridging the disarmament and deterrence communities, championing risk-reduction norms, and lending legitimacy to governance innovations that the established nuclear-weapon states cannot credibly champion without

undermining their deterrence postures. The chapter is attentive to the constraints on India's role, the China factor, the Pakistan dyad, domestic political pressures, and the limits of India's strategic bandwidth, while arguing that those constraints do not negate the analytical and practical salience of the Indian case.

Chapter 7 presents the monograph's diagnostic and analytical findings into an actionable policy agenda. It recommends a specific diplomatic portfolio for India and articulates the governance architecture of a post-treaty order that is both analytically realistic and normatively adequate to the challenge of managing nuclear risk in an era of great-power competition.

The monograph closes with the observation that the erosion of the classical arms control order does not foreclose governance; it changes its form. The habits of restraint, the practices of verification, and the norms of non-use that the classical order institutionalised are not simply extinguished when treaties expire or collapse. They become available for recombination in new institutional forms, forms that are partial, contingent, and fragile, but not therefore negligible. The task of arms control scholarship in the present era is to understand those forms clearly enough to help build them well.

CHAPTER 2
THE RISE AND FALL OF CLASSICAL ARMS CONTROL

Classical arms control was the practice of managing U.S.- Soviet nuclear competition through negotiated caps and deep transparency. Its logic rested on mutual vulnerability (both sides could inflict unacceptable destruction on the other) and thus on a shared interest in strategic stability (preventing crisis instability and arms races).[22] Verification, via data exchanges, on-site inspections, and national technical means (NTM), was the engine that built confidence, predictability, and routine interaction.[23] Cold War states accepted these constraints for political and military reasons: to limit costly, unchecked competition, reassure allies of peaceful intentions, and bind down dangerous surge capabilities (even as each side still sought advantage).[24] From the 1970s through the 1990s, an elaborate arms-control regime emerged, SALT, INF, START and related measures, dramatically reducing forces and bolstering crisis stability with intrusive verification.[25] Yet this success sowed the seeds of vulnerability. Technological and political changes (anti-ballistic missile systems, new weapon types, renewed great-power rivalry) began to erode the offence-defence balance and make verification more contentious. By the 2000s, the classical order unravelled: the U.S. left the ABM Treaty in 2002, INF collapsed in 2019, and the last strategic limits expired in 2026, leaving only fragmentary confidence-building measures in its wake.[26]

This chapter traces the emergence, consolidation, and erosion of what may be called ‘classical’ arms control: the network of largely bilateral, legally binding, and heavily verified agreements negotiated primarily between the United States and the Soviet Union/Russia from the 1960s through the early post, Cold War era. It argues that the rise of this system depended on a distinctive configuration of power, ideas, and technology that has since unravelled, producing what many scholars now describe as a crisis or even an end of traditional treaty-based arms control.[27]

2.1 Conceptual Foundations of Classical Arms Control

The conceptual foundations of arms control were laid in the late 1950s and early 1960s by figures such as Thomas Schelling and Morton Halperin, whose book *Strategy and*

Arms Control remains the canonical statement.[28] They defined arms control broadly as all forms of military cooperation between potential adversaries aimed at reducing the likelihood of war, limiting its scope and violence if it occurs, and minimising the economic and political costs of preparations for war.[29] This understanding distinguished arms control from both disarmament, which seeks the elimination of weapons, and narrow military planning, which focuses on winning wars rather than managing shared risks.

In William Walker's influential account of the 'nuclear order,' classical arms control is one key pillar of a managed system of deterrence among the major nuclear powers.[30] Alongside the non-proliferation regime, this order rested on a small number of nuclear-armed states accepting reciprocal restraints to preserve strategic stability and legitimacy. Classical arms control is thus best understood as a mode of institutionalised mutual restraint among adversaries, built on shared recognition of mutual vulnerability and codified in formal instruments with elaborate verification and compliance mechanisms.[31]

Classical arms control aimed not to eliminate nuclear weapons, but to make their competition more stable and predictable. Its underlying logic was that when two nuclear superpowers are *mutually vulnerable*, each can survive the other's second strike and retaliate; both have an interest in preventing any shift that would destabilise that balance.[32] In practice, arms-control treaties sought to slow arms races, cap launchers and warheads, and prohibit destabilising weapons, thereby reducing first-strike incentives.[33] This was often framed as ensuring *'strategic stability'*, a steady state where neither side thinks it can gain an advantage or survive an all-out exchange. As U.S. and Soviet statements put it at the START I negotiations, the goal was to 'improve survivability, reduce incentives for a nuclear first strike, and implement an appropriate relationship between strategic offences and defences'.[34]

From an international-relations perspective, classical arms control functioned as a regime: a network of principles, rules and institutions that turn private military competition into a semi-cooperative process.[35] Rules limited force sizes or banned categories; norms enshrined parity and reciprocity (e.g. neither side would seek absolute security at the other's expense; and decision procedures involved data exchanges, on-site inspections, and standing consultative commissions (the

SCC/BCC) that enforced the rules. Crucially, verification practices undergirded the regime: making each side's declarations cross-checked by inspectors or national technical means built *'predictability'* and trust. In this way, arms control managed uncertainty: rather than guessing how many warheads the other had or when it might test missiles, both sides gradually agreed to share information. As one analyst observed, the essence of verification is that even if it cannot prevent cheating, it can *'detect anomalies and provide a consultative forum.'* In effect, inspections and data-sharing *'became a key component of the treaty's success in building trust and maintaining strategic stability.'*[36]

These technical measures had a deep strategic rationale. The mutual-vulnerability logic meant that neither superpower could fully dominate the other's deterrent, so stabilising second-strike capability was paramount. Arms control reinforced this equilibrium. For example, the 1972 ABM Treaty codified mutual vulnerability by limiting missile defences to two small sites, preventing either side from undermining the other's assured retaliation capability.[37] And treaties like INF (1987) eliminated entire classes of potent middle-range missiles that had been destabilising in Europe. In all cases, the goal was to preserve a balance where neither could confidently launch a successful disarming strike, since such faith would make crises more dangerous.

Some analysts classify the goals of arms control into multiple motives: disarmament (reducing overall stockpiles), stability (managing competition), and advantage (securing better rules).[38] In practice, successful treaties often served more than one purpose. The ABM Treaty, for instance, was justified as both promoting stability (by maintaining mutual vulnerability) and lowering total defensive expenditures (a quasi-disarmament benefit). The key common thread was war prevention: as Jervis noted, any arms control must be rooted in an understanding of what causes war.[39] If certain weapons (like MIRVed ICBMs or anti-satellite systems) increase first-strike pressures, arms control aimed to contain those specific dangers. If industrial or political pressures push for costly buildups, arms control could impose ceilings to save resources. Regardless of motive, every effective agreement rested on the principle that *'any deal that preserves the balance of power well enough to be safe for the arming side'* must also be transparent enough to assure compliance.[40] Thus, at its conceptual core, classical arms control sought to bind both sides into rules that spelt out the otherwise

tacit assumption: ‘I will limit my nuclear forces in exchange for your doing likewise, because we both want to avoid a disastrous arms race or crisis.’

2.2 Historical Evolution of the SALT, START Peak

The conceptual framework above played out in a series of landmark agreements from the late 1960s through the 1990s. In SALT I (1972), the U.S. and USSR capped the number of ICBM and SLBM launchers and agreed not to build more anti-ballistic missile (ABM) sites beyond two (one for each). This offence-defence linkage was at the core: by constraining ABM deployment, SALT I guaranteed that mutual vulnerability would persist.[41] The key institutions were set up: each side would submit annual data on launches and warheads, and the SALT Standing Consultative Commission (SCC) would review compliance. Verification was mostly by national technical means (satellites, radars) supplemented by US and Soviet visits to known missile facilities. The Interim Agreement that accompanied SALT I further froze existing ICBM silo construction and SLBM tubes (without cutting existing weapons), illustrating the limitation paradigm.[42]

Negotiations continued to an intended SALT II (signed 1979). SALT II, never ratified due to the Soviet invasion of Afghanistan, would have limited launchers and warheads much more deeply. It reflected a growing understanding that stability required parity: ceilings were set identically on both sides. Though never legally in force, both superpowers generally adhered to its limits into the mid-1980s, maintaining the informal balance. (The Reagan administration later denounced SALT II as ‘flawed’, marking a pause in arms control that was only temporary.)[43]

A breakthrough came in the 1980s with the INF Treaty (1987). This treaty deleted all ground-launched ballistic and cruise missiles with ranges of 500-5,500 km, an entire class of weapons. Both sides destroyed thousands of missiles under intrusive verification: on-site, short-notice inspections checked launcher sites; telemetry from flight tests was exchanged; and national technical means monitored the destruction process. INF’s success depended on a very low tolerance for uncertainty: inspectors went inside missile silos to measure fuel loads and count missiles, ensuring no hidden launchers remained. With INF, the two sides demonstrated that they could completely

eliminate a weapon category while still trusting each other's compliance.[44] This achievement greatly enhanced crisis stability in Europe (by removing nuclear threats to NATO and Warsaw Pact countries) and showed that verification could support even radical disarmament.

The largest reductions came with the START negotiations at the end of the Cold War. START I (signed 1991, in force 1994) set ceilings of 1,600 delivery vehicles and 6,000 warheads per side.[45] The treaty required the destruction of excess missiles and bombers and introduced the most rigorous verification yet:[46] thousands of on-site inspections of ICBM and SLBM silos, bomber bases and warhead storage sites, along with continuous data exchange and telemetry sharing. The Soviet collapse delayed entry into force, but eventually the post-Soviet states joined the treaty and transferred weapons to Russia. By December 2001, START I was fully implemented, cutting the U.S. and Russian arsenals by roughly one-third each. These reductions occurred under an institutionalised regime: the Bilateral Consultative Commission regularly met to resolve technical issues, and the risk-reduction centres (established in 1987) managed daily notification exchanges (e.g. missile launches, tests).[47]

In sum, the historical arc was one of expanding scope: initial agreements froze what existed; INF and later START physically cut the numbers of weapons; and supplementary PNIs in the early 1990s saw the U.S. and USSR each withdraw many tactical nuclear weapons by unilateral declaration (less verifiable but politically symbolic). By the late 1990s, the United States and Russia had dismantled more than 70% of their Cold War nuclear warheads.[48] The institutional culture of arms control reached a peak: every new treaty brought new verification capabilities and transparency routines.

Table 2.1: Timeline of Major Classical Arms Control Milestones

Year	Treaty/Development	Description (caps, key features)
1963	Partial Test Ban Treaty	Banned nuclear tests in atmosphere/outer space/underwater.

1972	SALT I, ABM Treaty	Frozen launchers; ABM limited to two sites (maintaining mutual vulnerability).
1979	SALT II (signed)	Ceilings on launchers/warheads (2,250 vehicles); never ratified but largely observed.
1987	INF Treaty	Elimination of all 500-5,500 km ground missiles; intrusive on-site verification.
1991	START I	1,600 delivery vehicles, 6,000 warhead limit; reduction + on-site inspections.
1993	START II (signed)	3,000-3,500 warhead limit, ban on MIRVed ICBMs; not entered into force.
1995	NPT Review Conference	Indefinite extension of NPT (reinforcing status quo of nuclear order).
1996	CTBT opened for signature	Global ban on all nuclear explosions; not in force but norm widely adopted.
2002	ABM Treaty (U.S. withdrawal)	US withdraws, claiming need to develop wider missile defences.
2002	SORT (Moscow Treaty)	1,700-2,200 warheads each; relies on START I for verification.
2009	START I expires	Temporary gap in arms control; U.S./Russia rely on SORT data exchange.
2010	New START signed	1,550 warheads, 700 delivery systems; new verification regime (on-site inspections, data exchange).
2011	New START enters force	Verification begins: inspections, telemetry exchange, notifications.
2019	INF Treaty ends	U.S. withdraws, citing Russian noncompliance on prohibited missiles.
2026	New START expires	Bilateral strategic limits lapse (extension to Feb 2026 had been agreed).

Source: Treaty texts and historical summaries.[49]

2.3 Verification and Predictability as Stability Drivers

Verification was the engine of the classical order. Every major treaty built in transparency and meeting routines that generated cumulative confidence. For SALT I and II (1972, 79), verification was by national technical means (satellites, radars) with occasional on-site mapping visits.[50] By INF and START, routine on-site inspections became central. For example, START I required on-site inspections of all nuclear missile bases, telemetry data on missile tests, and an unprecedented information exchange.[51] These measures did more than count warheads; they forced both sides into a shared information space. Each inspection visit gave inspectors a 360° view of a silo or submarine; any asymmetric detail they might exploit was laid bare. Even the prospect of an inspection constrained cheating. In practice, the inspections and data exchanges built mutual trust: as a 2026 analysis noted, 'the New START information and monitoring regime was a key component of the treaty's success in building trust and maintaining strategic stability'.[52]

Aside from formal inspections, several enduring institutions emerged. The 1987 establishment of nuclear risk reduction centres in Moscow and Washington (one of the SALT follow-ons) created a mechanism for daily notifications of missile launches and other activities.[53] A U.S.- Soviet 'hotline' existed even earlier. The START I and New START treaties established Bilateral Consultative Commissions (BCCs) that met annually to address technical issues.[54] All these channels gave the superpowers the means to voice concerns short of a crisis. If one side suspected a treaty violation, it could raise it in the BCC rather than in public. These practices hybridised war prevention with treaty compliance: violations were handled as regime issues, defusing potential conflicts over force levels.[55]

Crucially, verification also made arms-control bargains politically tenable. When negotiators agreed to tough limits, they could assure domestic audiences that the other side truly complied. As the APSR analysis observes, the key tradeoff was that "monitoring … renders a state's arming transparent enough to assure its

compliance".[56] This gave regimes staying power: even U.S. political opponents of START I knew that failure to inspect Russian sites could undermine the deal's credibility, so they generally accepted the framework once in place. Over time, repeated successful inspections lowered paranoia. By the 1990s, it was routine for each side to share warhead counts and allow dozens of inspectors on the ground every year.[57]

From Peak to Crisis: The Erosion of Classical Arms Control

Many contemporary analysts locate the peak of classical arms control around the turn of the millennium, with the entry into force of CFE, Open Skies, and START I, the negotiation of START II (though it never entered into force), and the indefinite extension of the NPT in 1995. Kühn's periodisation of a 'thirty-year peak' from 1972 to 2001 is representative: the period began with SALT I and the ABM Treaty and ended just before the United States withdrew from the ABM Treaty in 2002.[58]

The U.S. decision under President George W. Bush to withdraw from the ABM Treaty is widely viewed as a critical inflexion point in the erosion of classical arms control. Announced in December 2001 and effective in June 2002, the withdrawal removed a central pillar of mutual restraint on strategic defences that had underpinned subsequent offensive arms reductions. Critics argued at the time, and many still contend, that abandoning the ABM Treaty opened the door to renewed offence, defence competition, and signalled a broader U.S. scepticism toward legally binding arms control.[59]

Over the following two decades, most of the core treaties of the classical era either collapsed or entered a deep crisis. Russia suspended implementation of the CFE Treaty in 2007 and later announced a complete halt to its participation, citing concerns over NATO enlargement and U.S. missile defence deployments; in 2023, it formally withdrew, prompting NATO states to suspend their own participation. The result has been the effective demise of what had once been considered the 'cornerstone' of conventional arms control in Europe.[60]

On the nuclear side, the INF Treaty came under strain from U.S. allegations beginning in 2014 that Russia had tested and deployed a ground-launched cruise missile

(9M729) in violation of the treaty's range limits. After attempts at diplomacy failed, the United States suspended its obligations and formally withdrew in August 2019; Russia reciprocated. Analysts widely regard the collapse of INF as removing one of the most stabilising agreements of the late Cold War, increasing fears of renewed missile deployments and shorter warning times in Europe and Asia.[61]

The Open Skies Treaty, another emblematic transparency instrument, suffered a similar fate. The United States announced its withdrawal in 2020, citing Russian non-compliance, and Russia later followed, undermining a regime that had provided thousands of cooperative overflights and valuable reassurance since entering into force. Coupled with the breakdown of conventional and nuclear arms control in Europe, these developments prompted observers to speak of the 'rise and fall' of cooperative arms control and of a deep or structural crisis in the field.[62]

New START and the Unravelling of Bilateral Nuclear Constraints

The 2010 New Strategic Arms Reduction Treaty (New START) initially appeared as a partial reprieve for classical arms control. It limited each side to 1,550 deployed strategic warheads and 700 deployed delivery systems, with robust verification measures including on-site inspections, data exchanges, and notifications. Entering into force in 2011, New START preserved a degree of predictability and transparency even as other pillars began to crumble.[63]

In 2021, the United States and Russia agreed to a one-time five-year extension of New START, pushing its expiration date to 5 February 2026. This move bought time but did not resolve underlying disputes, including disagreements about missile defence, long-range conventional capabilities, and the role of third nuclear powers, particularly China. Subsequent years saw growing tensions: Russia's 2023 announcement that it would 'suspend' participation in New START raised doubts about inspections and data exchanges, and by early 2026, analysts warned that the treaty was on track to expire without replacement, ending all legally binding limits on U.S. and Russian strategic nuclear forces for the first time in decades.[64]

The looming or actual expiration of New START, combined with the loss of INF and ABM, has led commentators to describe the arms control architecture as going ‘up in smoke’ and to portray the present moment as a ‘grave’ inflexion point for international peace and security. Policy briefs and scholarly analyses emphasise that while the material ceilings imposed by New START were important, its verification and notification regimes were equally significant, underpinning strategic stability and crisis management. Their erosion leaves both sides with reduced insight into each other’s forces and plans, which can feed worst-case assumptions and arms racing.[65]

Diagnosing the Crisis: Scholarly Perspectives

Recent scholarship has increasingly framed developments since the early 2000s as a ‘crisis’ or ‘end’ of classical arms control. Simone Wisotzki and Ulrich Kühn’s special issue on ‘Crisis in Arms Control’ in the Zeitschrift für Friedens- und Konfliktforschung synthesises multiple empirical cases, from nuclear to conventional and small arms, to argue that arms control regimes are being undermined by non-compliance, geopolitical rivalry, technological change, and domestic contestation. Their introductory article highlights how the COVID-19 pandemic and Russia’s invasion of Ukraine compounded pre-existing problems, delaying review conferences, disrupting implementation, and deepening distrust among key actors.[66]

Ulrich Kühn’s separate analysis of the ‘crisis of nuclear arms control’ between the United States and Russia offers a more focused historical narrative. He identifies three key enabling factors during the peak period, relative strategic parity, a degree of mutual trust and recognition of shared interests, and domestic political support for cooperative security, that have eroded since 2001. Without these factors, the traditional model of large, legally binding bilateral treaties struggles to function, especially in a context of renewed confrontation over issues such as NATO enlargement, missile defence, and regional conflicts.[67]

Linton Brooks, a former U.S. arms control negotiator, goes further in his widely cited essay ‘The End of Arms Control?.’ Writing in 2020, he argues that treaty-based nuclear arms control between Washington and Moscow is unlikely to survive in its classical form, given deep political mistrust, changing military technologies, and the increasing

salience of other nuclear and non-nuclear actors. Rather than attempting to revive the old model, Brooks calls for a reconceptualisation of arms control as a broader set of cooperative risk-reduction measures, including informal understandings and unilateral but coordinated steps.[68]

Other authors speak of a ‘deep crisis’ or ‘structural’ crisis in nuclear arms control and disarmament. Götz Neuneck, for example, stresses the cumulative effect of treaty erosion, modernisation programs, and the breakdown of U.S., Russian dialogue, while also noting the rise of China and other nuclear-armed states as central challenges to any future regime. Collectively, this literature underscores that the crisis is not merely a series of discrete treaty failures but reflects more fundamental shifts in power, technology, and norms.[69]

Fault Lines in the Classical Order

Even at its height, classical arms control had vulnerabilities. Several fault lines would later contribute to its collapse:

- **Defence, offence linkage.** The notion of mutual vulnerability meant any erosion of restraints by one side could trigger countermeasures by the other. The most evident example was the ABM Treaty. When the U.S. unilaterally withdrew from the ABM Treaty in 2002, it signalled an intent to pursue expansive missile defences.[70] Soviet/Russian leaders immediately decried this as a threat to the strategic balance. The U.S. justification, that new threats made the old ABM limits obsolete, changed the ‘shared vulnerability’ bargain. This eroded trust and showed that treaties could be abandoned when strategic calculus changed.
- **Technological change.** Emerging weapons complicated verification categories and stability calculus. Hypersonic glide vehicles and advanced cruise missiles blurred the lines between conventional and nuclear. A launch with an uncertain payload (conventional vs nuclear) could be misinterpreted in a crisis. Cyber operations and anti-satellite tests raised risks of inadvertent escalation: a cyberattack on missile warning systems or a dazzling of early-warning radars could be mistaken for an attack, compressing decision times. Although these issues would be addressed in detail in a later chapter, already

by the 1990s, states worried that classical counting rules did not cover these new domains. In essence, the classical model assumed that key objects (ICBMs, bombers, missiles) were countable and treaty-bound, but new tech introduced ambiguity and entanglement.[71]

- **Compliance politics.** Treaties depended on quiet compliance. When suspicions emerged, the system could handle technical dialogue, unless political winds blew it off course. By the 2010s, compliance disputes became politicised. For example, accusations over missile tests in the INF range could no longer be kept between technical experts; they became public and acrimonious, leading to collapse. The problem is that once a treaty's legitimacy is questioned, every technical issue becomes a political salvo. Classical arms control required a degree of trust and insulation from public posturing that later years often lacked.[72]
- **Multipolar nuclearisation.** Arms control was originally bilateral and largely ignored other nuclear powers. When China's arsenal began growing, and when India and Pakistan tested nuclear weapons, the two-party order appeared incomplete. The logic of parity became harder to apply: could the U.S. or Russia legitimately cap their weapons if Chinese forces were unrestricted? Such asymmetries strained the notion that strategic stability was solely a U.S.-Russia problem.[73] Moreover, the inclusion of nuclear-armed U.S. allies (via NATO sharing) introduced further complexity. Classical treaties had sidestepped many of these issues; in later years, this avoidance contributed to perceptions of double standards.[74]

In sum, classical arms control was ambitious: it built a dense regime of cuts and rules undergirded by verification. This system rested on assumptions of mutual interest, limited technology categories, and a bipolar-controlled order. By the early 2000s, those assumptions were loosening. The institutions lived on (e.g. risk-reduction centres still exist), but their relevance had been hollowed out by these tensions.[75]

Normative and Institutional Fragmentation

Alongside these structural drivers, normative and institutional changes have reshaped the landscape in which classical arms control once operated. Many non-nuclear-weapon states and civil-society actors have grown increasingly frustrated

with what they perceive as the failure of the nuclear-armed states to fulfil their disarmament obligations under Article VI of the NPT. This frustration helped fuel the humanitarian disarmament initiative and culminated in the 2017 Treaty on the Prohibition of Nuclear Weapons (TPNW), which outlaws the possession and use of nuclear weapons for its parties.[76]

From the perspective of classical arms control, the TPNW represents both continuity and rupture. On the one hand, it seeks to advance the long-standing disarmament goals embedded in the NPT and earlier instruments. On the other hand, it embodies a more confrontational strategy toward the nuclear-armed states and challenges the notion that incremental, step-by-step arms control among the major powers is the only or even the primary path forward. This has contributed to a bifurcation of the normative landscape, with NPT-centric, state-centric arms control on one side and prohibition-oriented, humanitarian approaches on the other.[77]

Institutionally, the crisis in arms control has been mirrored by shifts in funding and expertise. Wisotzki and Kühn note, for example, that the MacArthur Foundation's decision to end its long-standing support for nuclear arms control research by 2023 was widely interpreted as a vote of no confidence in gradualist approaches. Although other funders and institutions have stepped in, the episode underscores the perception that the classical model has reached diminishing returns.[78]

Table 2.2: Comparison of Key Classical Arms-Control Treaties

Treaty	Parties	Limits (caps)	Verification/Enforcement	Entry into Force/Status
SALT I Interim (1972)	US, USSR	No new ICBM silos; limits on new SLBM tubes; no new ABM sites (2 total sites maximum).	Data exchange on launchers; (mainly national technical means, with occasional on-site visits in SALT II version).	In force 1972; expired/ superseded by START.
ABM Treaty (1972)	US, USSR	Max. 100 ABM interceptors at one site (US), 100 at one site (USSR); later	Data exchange on ABM systems; annual declarations; limited on-site inspections of ABM sites.	In force 1972; US withdrew in 2002

		reduced to 100 total each.		(effective by June 2002).
SALT II (1979, not in force)	US, USSR	Up to 2,400 total strategic launchers; detailed limits on various systems (ICBMs, SLBMs, bombers); parity-based design.	Would have required periodic data exchanges and annual declarations; not ratified.	Signed 1979; never ratified (withdrawn verbally 1986). Parties pledged to observe limits despite non-entry.
INF Treaty (1987)	US, USSR	Eliminate all 500, 5,500 km ground-launched ballistic and cruise missiles.	Highly intrusive: short-notice on-site inspections of missile bases, telemetry exchange on flight tests, NTM monitoring.	In force 1988; US withdrew in 2019 (citing Russian violation).
START I (1991)	US, USSR (post-1991 Russia + others)	≤1,600 delivery vehicles (ICBMs, SLBMs, heavy bombers) and ≤6,000 warheads each.	Comprehensive: on-site inspections, telemetry exchange, annual data declarations, NTM (satellite) verification.	Entered into force 1994; fully implemented by 2001; expired Dec 2009.
START II (1993, not in force)	US, Russia	→3,000, 3,500 warheads each; banned land-based MIRVed ICBMs.	Verification identical to START I; would have used START I mechanisms.	Signed 1993; not ratified after US, ABM conflict; never entered into force.
START III (negotiations, not concluded)	US, Russia	Proposed ~2,000, 2,500 warheads; aimed to destroy	Planned to require dismantling of warheads and delivery vehicles.	Negotiations stalled; never signed (START II never

		strategic warheads for irreversibility.		entered force).
SORT (2002)	US, Russia	1,700, 2,200 operationally deployed strategic warheads each.	Relied on existing START I verification (ratified that START I remain in force); no new on-site provisions.	Entered into force June 2003; warhead limits applied Dec 2009, 2012; superseded by New START 2011.
New START (2010)	US, Russia	≤1,550 deployed strategic warheads on ≤700 launchers each; ≤800 total (deployed+non-deployed) launchers.	On-site: 18 inspections/year (10 hosted, 8 unhosted); data exchanges on deployments and facilities; telemetry on missile tests; NTM allowed (no secrecy).	Signed 2010; in force 2011 (extended by agreement to Feb 2026).

Source: ACA summaries of treaty provisions and verification details compiled by the author

Table 2.3: Emerging Technological Challenges to Classical Arms Control

Technology/Domain	**Why it complicates classical arms control**	**Example implications for arms control**
Missile defence (BMD)	Erodes mutual vulnerability; breaks offence, defence balance	Encourages counter-measures (more warheads/decoys); incentives to decouple strategic parity.
Hypersonic weapons	Fast, maneuverable; can be nuclear or	Reduces warning time; raises first-strike fear; complicates

	conventional (dual-capable)	arms counting (no range treaties).
Cyber operations	Threaten NC3 and early warning systems (invisible, hard to attribute)	Increases risk of miscalculation; no treaty currently covers cyber attack on warning or command infrastructure.
Anti-satellite (ASAT) weapons/Space	Can blind satellites and radars that support verification and early warning	Undermines transparency; no agreed limits on space warfare; debris risk escalations.
AI & autonomy	AI-driven command systems & autonomic launch	Unknown reliability; could spur 'use-it-or-lose-it' pressures if decision time shrinks.
Conventionally prompt strike (long-range precision)	Can approach nuclear asset targets quickly, causing ambiguity	Triggers nuclear alarms; calls for 'no strike' agreements or shared risk-reduction.

Source: ACA reports, UNIDIR reports

This list highlights how new capabilities were not envisioned in treaties. It draws on contemporary analyses of arms control and emerging threats (e.g. ACA reports, UNIDIR work. Each entry shows why classical counting/limits struggle with these technologies, hinting at the post-treaty challenges discussed later.

Reimagining Arms Control in a Post-Classical Era

In response to this crisis, a growing body of work seeks to 'reimagine' arms control for a world of multipolarity, emerging technologies, and deep mistrust. Acton proposes a hybrid approach that combines a core legally binding treaty on strategic offensive forces with a suite of politically binding transparency and confidence-building measures addressing non-strategic weapons, new technologies, and third-party forces. Politically binding arrangements, they argue, can be more flexible and easier to adapt than treaties, and can serve as stepping stones to more formal constraints.[79]

Policy briefs such as Andrew Reddie's 'Beyond New START' similarly argue that even if large, comprehensive treaties are unlikely in the near term, arms control remains relevant as a means of mitigating specific risks, such as inadvertent escalation or arms racing in particular domains. Recommendations include mutual declarations of force levels, notifications of certain tests and deployments, codes of conduct for cyber

operations that could affect nuclear systems, and regional measures to manage new missile deployments after the end of INF.[80]

George Perkovich and other contributors to recent American Academy of Arts and Sciences projects emphasise the importance of reviving dialogue on strategic stability across multiple dyads, not only the U.S.-Russia dyad, but also the U.S.-China and regional rivalries, while exploring new issue areas such as space, cyber, and autonomous systems. They caution that arms control alone cannot resolve underlying geopolitical conflicts, but argue that carefully designed measures can reduce the risks of misperception and crisis instability even in adversarial relationships.[81]

At the same time, scholars like Brooks insist that the concept of arms control should be broadened beyond treaties to include unilateral restraint, parallel but uncoordinated decisions, military-to-military contacts, and crisis communication channels. From this viewpoint, the 'fall' of classical, treaty-centric arms control does not mean the end of cooperative efforts to manage armaments, but rather a shift toward a more heterogeneous repertoire of tools.[82]

Classical Arms Control in Retrospect

Looking back, classical arms control can be seen as a historically contingent response to a particular configuration of threats, technologies, and power relations. Its achievements were considerable: it codified mutual vulnerability, reduced the most destabilising classes of weapons, institutionalised verification and transparency, and contributed to a long period without great-power war or nuclear use. At the same time, it was limited in scope, largely excluding third countries, focusing heavily on strategic nuclear systems while leaving massive conventional asymmetries and non-strategic nuclear weapons inadequately addressed.[83]

The erosion of this system since the early 2000s reflects not only the choices of particular leaders or administrations but also deeper and more diffuse forces. The diffusion of power, the advent of new technologies, the re-politicisation of arms control in domestic arenas, and the fragmentation of normative frameworks have all conspired to make the old model increasingly weak. Whether a new, more inclusive and adaptive arms control order can be fashioned remains an open question, but any such order will likely depart significantly from the classical paradigm in both form and function.[84]

Even as the classical order matured, its weakness lay in precisely the factors that had not been tested by treaty. By the 2000s, U.S., Russia relations had cooled, and the incentives that once made arms control possible had shifted. The withdrawal from the ABM Treaty in 2002 showed that the offence-defence balance could be unilaterally altered. The admission that any party could cite ‘extraordinary events’ to abandon a treaty undercut confidence that limits would endure.[85] New technologies (antimissile defences, hypersonics, counter-space, cyber) created domains where classical counting rules had no purchase. And multipolarity eroded the U.S., Russia dyad assumption. But in the classical phase, these were still manageable as foreshadowings. States continued business-like verification up through New START, even as these new challenges accumulated. In essence, the seeds of collapse were planted in the assumptions of classical control itself: that two rivals could bind themselves indefinitely under agreed rules. When those assumptions finally broke, the sophisticated structure of classical arms control began to fall apart, as explored in the next chapter.

CHAPTER 3
THE CRISIS OF TREATY-BASED DISARMAMENT

Treaty-based disarmament is in crisis not because treaties have ‘failed’ in an abstract sense, but because the political, strategic, and technological conditions that once made verifiable constraint feasible have eroded. The loss is twofold. First, the ‘hard’ architecture of strategic stability, built around the ABM, INF, and START/New START line, has been dismantled through withdrawal, collapse, and expiry, removing the routines that made mutual vulnerability governable rather than merely frightening. Second, multilateral disarmament instruments and processes that were meant to consolidate restraint, CTBT, FMCT, and the NPT review bargain, are caught in a legitimacy-and-verification trap: widely endorsed in principle, but unable to deliver binding commitments that keep pace with modernisation, rivalry, and enforcement disputes.[86]

The ‘failure mechanics’ of this crisis are structural. Treaties stop working when (a) domestic politics makes restraint costly to defend; (b) strategic asymmetries turn parity-based bargains into perceived disadvantage; (c) compliance disputes become politicised ‘credibility contests’ rather than solvable technical disagreements; and (d) war or major confrontation makes inspection rights and reciprocal access politically unacceptable. These failure modes do not automatically produce immediate arms racing in numbers, but they reliably produce something equally corrosive: the loss of predictability and the return of worst-case planning as the default.[87]

This chapter, therefore, separates two analytic bundles. The first explains how the strategic stability spine (ABM/INF/New START) was hollowed out and why the disappearance of verification is the most consequential shock. The second shows why CTBT, FMCT, and the NPT function as stress tests for legitimacy: they expose how disarmament promises, verification feasibility, and fairness arguments collide, pushing nuclear governance away from comprehensive treaty settlement and toward ad hoc coalitions, partial transparency, and domain-specific norms, developments taken up in Chapter 3.[88]

Strategic Stability Spine Under Stress

Classical strategic arms control was structurally built around an interlocking logic: mutual vulnerability reduced incentives for a first strike, and treaties made that vulnerability politically tolerable by adding ceilings, predictability, and verification routines. The ABM Treaty helped stabilise offence-defence relations; INF removed an especially crisis-prone class of theatre missiles; and START/New START capped deployed strategic forces while embedding inspections and notifications. The crisis begins when these instruments cease to operate as living verification regimes and become, at best, memories or informal political reference points.[89]

ABM Withdrawal as an Offence-Defence Rupture

The ABM Treaty was not a symbol; it was a design choice about stability. By limiting anti-ballistic missile (ABM) defences, it helped institutionalise mutual vulnerability and reduced incentives for either side to expand offensive forces to overwhelm emerging defences. Its collapse mattered beyond legal form because it altered expectations about how offence and defence would be governed: rather than treating defence restraint as part of strategic stability, the United States re-framed missile defence development as a sovereign necessity in a post-9/11 threat environment.[90]

President George W. Bush's 13 December 2001 announcement explicitly tied withdrawal to the claim that the ABM Treaty hindered the development of defences against 'terrorist or rogue state missile attacks', and described leaving behind "one of [the Cold War's] last vestiges." In the accompanying diplomatic note (reproduced in widely circulated documentation), the United States invoked Article XV's 'extraordinary events' clause and argued that proliferation of WMD and ballistic missiles jeopardised its supreme interests, justifying withdrawal effective six months after notice. The move thus shifted the normative centre of gravity: the stabilising premise of mutual vulnerability was publicly reinterpreted as obsolete, or at least secondary to defence flexibility.[91]

The Russian response in December 2001 illustrates why ABM withdrawal had systemic effects even when Moscow publicly downplayed immediate vulnerability. Putin stated that the decision was 'mistaken' but argued that Russia could overcome missile defence and that withdrawal did not threaten Russian national security, while

noting Russia had sought to preserve the treaty. This combination, formal objection plus reassurance, did not erase the underlying strategic anxiety: once defence constraints were removed, future offence-defence bargaining became harder, because the stabilising 'trade space' that had linked offensive limits to defensive limits was weakened. In later years, this offence-defence rupture became a recurring explanatory frame for Russian and Chinese suspicion that U.S. missile defence ambitions could undermine retaliatory capability and thus destabilise deterrence.[92]

The long-run institutional consequence was to normalise unilateral exit from a cornerstone treaty as an acceptable response to 'changed circumstances.' That matters for treaty-based disarmament because it reduces confidence that even successful agreements are durable across strategic cycles. It also increases the bargaining premium on flexibility: if one side believes the other may later exit, it has incentives to avoid constraints that are difficult to reverse, and to prefer reversible political statements over binding provisions. In regime terms, ABM withdrawal weakened a principle (managed mutual vulnerability) and tightened a pathology (treaty exit as strategic instrument), shaping later crises.[93]

INF collapse and the politics of compliance

The INF Treaty's significance lay in its ambition and its verification precedent. It eliminated all U.S. and Soviet ground-launched ballistic and cruise missiles of 500-5,500 km range and set a benchmark for intrusive monitoring. When it collapsed in 2019, what was lost was not only a category ban but also a demonstration that highly intrusive verification could underpin meaningful elimination. The loss matters because verification successes are cumulative: they build habits of cooperation, create shared technical languages, and sustain the credibility that later agreements require.[94]

INF's death was driven by a compliance dispute that became politically unsustainable. NATO's 1 February 2019 statement framed Russia's 9M729 system as a material breach and warned that unless Russia returned to full and verifiable compliance through destruction of those systems before withdrawal took effect, Russia would 'bear sole responsibility' for the end of the treaty. This language mattered: it explicitly treated treaty preservation as contingent on demonstrable compliance, but it also signalled that the alliance had moved from a quiet technical dispute toward a public attribution

battle, one of the classic pathways by which compliance management becomes existential for the treaty itself.[95]

The United States' withdrawal formalised that dynamic. In the U.S. defence messaging surrounding the August 2, 2019, withdrawal, Secretary of Defence Mark Esper described the exit as a response to 'sustained and repeated violations' by Russia across multiple administrations and emphasised that Russia was 'producing and fielding' prohibited capability. The statement also foreshadowed a strategic shift: once unconstrained, the Department of Defence would pursue ground-launched conventional missiles as a 'prudent response' and as part of broader conventional strike options. This is a key failure mechanism: when a treaty ends through a compliance dispute, the post-treaty environment is not neutral; it is structured by the same rivalry narratives that killed compliance dialogue in the first place.[96]

INF's collapse also reveals a geographic and multipolar limit in the classical model. Although INF was bilateral, the strategic demand for intermediate-range missiles is shaped by theatre realities, particularly in Europe and Asia. A bilateral ban constrained U.S. and Russian systems but not those of other states fielding significant intermediate-range capabilities; this asymmetry fed arguments, in U.S. strategic debate especially, that INF restricted U.S. posture in Asia and therefore became politically harder to defend as China's regional missile forces grew. Even without deep technology discussion, the key point is institutional: treaties that appear to 'bind only two' in a multipolar theatre can become vulnerable to strategic narratives that portray restraint as unilateral disadvantage.[97]

The verification precedent lost with INF is often under-appreciated. A category-elimination treaty with on-site inspections is not merely a tool for that treaty; it is a proof of concept that hard verification is possible. When the proof of concept disappears, future proposals for similar intrusiveness face greater scepticism, because policymakers and publics can point to INF's end as evidence that even highly verified regimes can be overwhelmed by politics. INF thus contributed to a broader 'verification pessimism' that complicates treaty-based disarmament efforts, especially when paired with later inspection breakdowns under New START.[98]

New START Expiry and the Disappearance of Verification

New START served as the final legally binding, verifiable cap on the world's two largest strategic nuclear arsenals. Its formal ceilings were well known: 1,550 deployed strategic warheads, 700 deployed delivery systems, and 800 deployed and non-deployed launchers, supported by data exchanges, notifications, and a treaty governance body (the Bilateral Consultative Commission). Yet the more important feature for stability was its verification system: national technical means plus 18 annual short-notice on-site inspections (10 Type One inspections at operational bases and 8 Type Two inspections at non-deployed facilities). In classical arms control, those routines were the daily practice that constrained worst-case thinking.[99]

The path to expiry matters because it illustrates how treaties can die before they legally end. On-site inspections under New START stopped in 2020 because of the COVID-19 pandemic; the more damaging development was that they did not meaningfully resume, and the treaty's transparency functions were progressively hollowed out by broader confrontation. In February 2023, Putin announced the suspension of Russia's participation in New START in the context of the Ukraine war and argued that Western involvement and demands for inspections under these conditions were unacceptable, while also insisting that Russia was 'suspending' rather than withdrawing. Reuters reporting underscores the practical consequence: fewer verification opportunities beyond national technical means, making compliance more contestable and increasing reliance on unilateral interpretation.[100]

In February 2026, New START expired. UN Secretary-General António Guterres described expiration as a 'grave moment' and emphasised that, for the first time in more than half a century, the world faced a situation without binding limits on the strategic arsenals of the two states holding the overwhelming majority of global nuclear weapons. This is an institutional inflexion point: it ends a framework that had provided not only caps, but structured transparency and a formal obligation to exchange information and host inspectors.[101]

The 'real shock' is therefore epistemic and procedural: without the treaty's embedded information flows, both sides lose a shared baseline for what counts as normal deployment and what counts as signalling. The risks include not only numerical build-ups but also misinterpretation and hedging. The Federation of American Scientists

warned at the moment of expiration that, in the absence of an official follow-on agreement, both countries would likely default to mutual distrust and worst-case assumptions, and highlighted ‘warhead upload capacity’ allowing relatively rapid increases in deployed forces. Upload capacity is a classic treaty failure amplifier: it makes arms racing easier if political incentives shift, and it makes distrust sharper even if neither side actually uploads, because each must plan for the other to do so.[102]

Official reactions also show how the politics of successor negotiations are now structurally constrained by rivalry and multipolarity. Reuters reporting describes President Trump rejecting Russia’s proposal to voluntarily adhere for one year to New START limits, arguing for a ‘new, improved and modernised’ treaty instead. China’s Foreign Ministry spokesperson characterised New START’s expiration as ‘truly regrettable’, called it vital to strategic stability, and urged renewed dialogue, while reiterating China’s smaller arsenal posture and rejecting participation in U.S.-Russia bilateral reductions. In practice, this creates a triangular dilemma: U.S. domestic politics pushes toward ‘including China’, Russia emphasises UK/France inclusion or bilateral sequencing conditional on Ukraine-related dynamics, and China rejects joining a bilateral framework as long as its arsenal remains smaller and its security concerns differ.[103]

A small but telling detail underscores how much was lost: New START’s regime made verifiable ceilings routine. Once the treaty ended, even if both sides claimed they would behave ‘responsibly’, that claim became non-verifiable without shared access. Russia’s leadership messaging in February 2026 combined regret about expiry with assurances of responsible conduct; Russian Foreign Minister Sergey Lavrov was reported as saying Russia would continue to observe the caps as long as it believed the United States did so too. Such reciprocal political restraint may reduce immediate risks, but it is a weaker form of governance than treaty-based verification: it depends on subjective assessment of the other’s behaviour and is therefore vulnerable to rumour, misperception, or strategic manipulation.[104]

Table 3.1: Strategic Stability Spine, What Failed and What was Lost

Treaty	What it stabilised	Verification/predictability function	Failure mechanism (high-level)	What the system lost
ABM (1972-2002)	Offence-defence coupling; mutual vulnerability	Normative restraint on defences; consultative channels	U.S. withdrawal citing changed threats	A shared premise that limiting defences can stabilise offence, plus confidence in treaty durability
INF (1987-2019)	Theatre crisis stability; Europe missile risk	Category elimination; intrusive inspections	Compliance dispute escalated into treaty death	Proof of concept for elimination with intrusive verification; constraints on intermediate-range deployments
New START (2011-2026)	Strategic caps; transparency	Inspections, notifications, data exchanges, consultative mechanisms	Suspension hollowed out regime; expiry ended caps	Shared baseline of deployed forces; routine mutual visibility; legally binding limits

Source: Author's compilation from various sources.[105]

Common Failure Mechanisms: Why Treaties Stop Working

The ABM, INF, and New START cases are not interchangeable, but they share recurring 'failure mechanics' that explain why treaty-based disarmament has become hard to sustain in great-power competition. These mechanisms operate in combination, and any single one can be survivable; the crisis begins when several converge.[106]

A first mechanism is domestic polarisation, which changes the political value of arms control from a bipartisan stabiliser into a partisan liability. In such conditions, 'compliance' becomes a tool of domestic contestation: accusing the other side of

cheating is politically easier than sustaining the slow, technical work of dispute resolution. The result is brittle durability. Treaties require patience, but polarised politics rewards dramatic signals, withdrawal, suspension, or maximalist bargaining positions, especially when the international environment provides a plausible justification.[107]

A second mechanism is strategic asymmetry, especially in a multipolar environment. Classical arms control assumed that the primary competition could be stabilised bilaterally because U.S. and Soviet/Russian forces dominated global totals. As other nuclear actors expand or modernise, bilateral ceilings can be portrayed as constraining one's ability to respond to a combined threat environment. This does not mean bilateral arms control is obsolete; it means it becomes politically easier to argue that bilateral limits are 'unfair' or 'strategically outdated', and therefore easier to abandon.[108]

A third mechanism is compliance disputes turning into public credibility contests. Technical disputes are normal in verification regimes; what kills regimes is when the dispute becomes a public test of resolve, making compromise appear as weakness. NATO's INF statement and U.S. withdrawal messaging illustrate the escalation pathway: dispute → attribution → ultimatum → exit. Once that pathway becomes familiar, compliance disputes become more dangerous for all treaties, because policymakers learn that exit is a viable response to enforcement frustration.[109]

A fourth mechanism is inspection politics under confrontation. Inspection rights depend on mutual acceptance that reciprocal access is legitimate even under tension. War or major confrontation transforms inspection into vulnerability: hosting inspectors while accusing the other side of aggression becomes politically untenable. Russia's 2023 New START suspension in the context of the Ukraine war illustrates this dynamic in practice, and the subsequent hollowing-out shows why 'verification disappearance' is often the real death of a treaty long before formal expiry.[110]

A fifth mechanism is design strain, where treaty counting rules no longer match strategic behaviour. Treaties often cap deployed strategic warheads and launchers, but strategic competition may shift toward non-deployed upload potential, novel delivery systems, or ambiguous dual-capable platforms. Even without extensive technical analysis (reserved for Chapter 4), a basic point follows: when key stability

drivers are outside the treaty's scope, the treaty looks less relevant to military planners and easier to discard. This is why New START's expiration is often framed not only as a loss of numbers caps but as a loss of a framework that was already struggling to govern the totality of the strategic relationship.[111]

Finally, and most importantly, there is a geopolitical primacy mechanism: treaties follow geopolitics; they do not override it.' When strategic environments become benign, ambitious arms control becomes possible; when environments become hostile, arms control can survive only if leaders deliberately insulate it. Recent policy analysis argues that the danger of a post-New START world is not its novelty, but that it reflects the return of 'hard-edged' competition in which the strategic environment is no longer conducive to comprehensive treaty bargains.[112]

These mechanisms explain why treaty-based disarmament is not simply a technical project that can be restarted once diplomats return to the table. It is an institutional form that requires a specific political ecology: stable channels, manageable compliance disputes, and a shared willingness to treat verification as productive rather than humiliating. The erosion of these conditions is why the crisis is best framed as 'failure mechanics', not mere political disappointment.[113]

Legitimacy and Verification Stress Tests

If the strategic stability spine shows how bilateral treaties die, CTBT, FMCT, and the NPT show why the broader disarmament bargain is contested even when states affirm it rhetorically. These instruments are best treated as stress tests because they reveal recurring dilemmas in treaty-based disarmament: near-universal endorsement without entry into force (CTBT), negotiation paralysis under consensus rules (FMCT), and regime legitimacy erosion when disarmament obligations appear structurally under-delivered (NPT). Together, they push states toward informal restraint, partial norms, and alternative fora, without, however, resolving the underlying fairness and verification problems.[114]

The CTBT in Limbo

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) bans 'any nuclear weapons test explosions or any other nuclear explosions', but it has not entered into force because Article XIV requires ratification by 44 named 'Annex 2' states. A key failure mechanic

is thus built into the treaty: near-universal support is insufficient without a small set of politically pivotal ratifications. CTBTO documentation makes the logic explicit: entry into force occurs 180 days after all 44 Annex 2 states have ratified, and Annex II lists those whose ratification is mandatory.[115]

Yet the CTBT has also created one of the most consequential 'partial successes' in disarmament governance: an operational verification system without an in-force treaty. The CTBTO's International Monitoring System (IMS) is described as a global network that, when complete, will consist of 321 monitoring stations and 16 laboratories across 89 countries, with around 90 per cent of its facilities already operating and providing real-time data. In October 2025, CTBTO Executive Secretary Robert Floyd reported that 307 certified facilities (of 337 planned) were operating worldwide using four technologies: seismic, hydroacoustic, infrasound, and radionuclide. This is notable because it means a treaty-in-waiting already produces a public good: reliable detection capacity that can underpin the testing taboo.[116]

The CTBT's failure mechanism, therefore, is not technical; it is political durability and legitimacy. The monitoring system strengthens the norm against testing, but the treaty's legal non-entry makes the taboo fragile under serious confrontation. Recent events underline that fragility. In 2023, Russia passed legislation revoking its ratification of the CTBT, reportedly to mirror the United States' status as a signatory that has not ratified, while Russian officials emphasised continued respect for the ban unless the United States tested first. This episode matters because it shows how easily the taboo can be folded into reciprocity narratives during a geopolitical crisis, even when scientific monitoring is strong. [117]

A further stress point is that CTBT's verification regime includes on-site inspections in its Protocol, but those inspections are tied to entry into force. As a result, the world has a robust detection system but lacks the full legal toolkit that would allow the treaty to respond to ambiguous events with treaty-authorised inspection mechanisms. In the long run, this undermines treaty-based disarmament credibility: if a ban is not legally operational, adversaries can treat it as optional under extreme conditions, and supporters can only appeal to norms rather than enforceable law.[118]

FMCT ‘never happened’

The Fissile Material Cut-off Treaty (FMCT) is the archetype of negotiation paralysis. The core idea, banning the future production of fissile material for nuclear weapons or other nuclear explosive devices, has been discussed in the Conference on Disarmament (CD) since the 1990s. UNIDIR’s foundational work documents that the CD began discussing negotiations in 1994 and that agreement on a negotiation mandate has repeatedly proven elusive for political reasons, including disputes over scope and verification. Even when a mandate seemed possible, the CD’s consensus rule and linkage politics allowed single-state objections to halt progress.[119]

A crucial contemporary indicator is that FMCT is widely treated as ‘urgent’ and ‘overdue’ even among those who disagree on how to negotiate it. In a 2025 CD statement (CD/2484), the European Union called for the immediate commencement of FMCT negotiations in accordance with CD/1299 and explicitly urged states to facilitate ‘long-overdue’ negotiations. The same document urged moratoria on fissile material production pending a future treaty and criticised political obstruction within the CD, including blocking observer participation, as undermining the authority and inclusivity of the CD as a negotiating forum. In other words, even supportive blocs now treat the procedure of negotiation as part of the crisis, not merely the substance.[120]

UNODA’s documentation on FMCT support shows a second pathway around CD paralysis: the UN General Assembly’s establishment of a high-level FMCT expert preparatory group (Resolution 71/259) and subsequent consultative processes. This illustrates a governance shift that is central to Chapter 3: when the treaty forum cannot negotiate, states create auxiliary processes to develop elements of a treaty elsewhere. Yet this workaround is also a symptom of failure mechanics. It reveals that the ‘single multilateral negotiating forum’ has lost its capacity to deliver, forcing the international community into fragmented preparatory efforts whose political relationship to eventual binding negotiation remains uncertain.[121]

The FMCT impasse is also a legitimacy stress test because it sits at the intersection of disarmament and non-proliferation. For many states, a production ban without addressing existing stockpiles appears unequal: it can freeze asymmetries, especially in South Asia, where fissile material stockpiles are entwined with deterrence dynamics. Whether or not one accepts that critique, it helps explain why FMCT has become

trapped in distributive conflict: a ban looks like an advantage to some and a constraint to others, and consensus-based institutions are structurally vulnerable to such distributional disagreement.[122]

NPT Strain: Bargain Imbalance and Contested Compliance

The NPT is not a disarmament treaty in the same way that START, or the CTBT is; it is a bargain that anchors a disarmament obligation in exchange for non-proliferation commitments and peaceful use rights. Its crisis role in this chapter is as an institutional 'stress test': it reveals how legitimacy is lost when (a) disarmament obligations appear under-delivered, (b) compliance enforcement is contested, and (c) fairness arguments harden into factional diplomacy. The UNODA's NPT background materials for the tenth Review Conference underscore the treaty's unique claim: it is the 'only binding commitment in a multilateral treaty to the goal of disarmament by the nuclear-weapon States.' They also document recurring inability to reach consensus on final declarations in several review conferences, and identify persistent disputes centred on disarmament implementation, nuclear testing, qualitative developments, security assurances, and regional issues such as the Middle East WMD-free zone process.[123]

The 2022 Review Conference outcome illustrates how legitimacy stress and geopolitical crisis interact. Arms Control Association reporting states that Russia blocked consensus on the 2022 outcome document because of disagreement over language linked to the Zaporizhzhia nuclear power plant crisis during Russia's war in Ukraine. SIPRI's commentary similarly notes that Russia reportedly objected to draft text about Ukrainian facilities under Russian control and argues that the treaty's deeper problems go beyond this immediate crisis, meaning even a consensus might have been only a temporary reprieve. In legitimacy terms, this is damaging: when review conferences fail, the regime loses the symbolic and procedural reaffirmations that non-nuclear states treat as accountability mechanisms for disarmament progress.[124]

Recent scholarship helps explain why this strain persists even when NPT membership remains broad. Nina Tannenwald argues that the NPT is a 'strongly institutionalised but weakly liberal' regime whose uneven institutionalisation produces a hierarchical distribution of burdens and sustained contestation rooted in inequality between nuclear 'haves' and 'have-nots.' Baldus, Müller, and Wunderlich similarly describe a

comprehensive crisis of the non-proliferation regime driven by the absence of genuine disarmament, intra-regime conflicts (including over pillar weighting), and proliferation crises that are harder to enforce because great-power rivalry interferes with collective action. Together, these analyses show why 'crisis' is multi-dimensional: it is simultaneously about disarmament delivery, process legitimacy, and enforcement politics.[125]

Compliance controversies deepen this crisis because they trigger fairness claims. Iran and DPRK are often invoked as evidence of enforcement failure or selective enforcement, while questions over alliance practices (e.g., nuclear sharing arrangements) and new arrangements involving naval nuclear propulsion have generated debates about whether the NPT's rules are interpreted consistently. This chapter does not adjudicate these disputes in depth (reserved for later treatment), but the stress-test point is clear: when different coalitions perceive double standards, they reduce their willingness to accept additional constraints, and review forums become arenas for legitimacy contestation rather than problem-solving.[126]

Table 3.2: Legitimacy and Verification Stress Tests, Status and Failure Mechanics

Instrument	Practical achievement	Core failure mechanic	Why it matters for 'treaty-based disarmament'
CTBT	IMS detection capacity operates at scale; taboo against testing largely holds	Entry into force blocked by Annex 2 ratification; inspections unavailable until EIF	Treaty-in-waiting underwrites norms but lacks full legal enforcement; taboo vulnerable in crisis
FMCT	Broad rhetorical support; expert processes outside CD develop elements	CD paralysis under consensus; scope/verification and regional rivalry disputes	Shows limits of consensus negotiation; shifts governance to auxiliary processes
NPT	Near-universal membership; safeguards and review cycle structure	Disarmament deficit; compliance controversies; review outcomes repeatedly fail	Legitimacy erosion spills into broader arms control: fewer shared baselines, more factional bargaining

Source: Author's compilation from various sources[127]

The combined effect of these failures is not the disappearance of arms control, but a transformation of its form. When treaty mechanisms weaken, governance reappears as informal restraint (political moratoria and reciprocal pledges), minilateral coordination (alliances and small-group dialogues), and domain-specific norms (behavioural constraints and incident-prevention measures). This is already visible in the way New START expiry is managed rhetorically through voluntary restraint discussions, while FMCT progress shifts to expert preparatory architectures outside the CD, and CTBT enforcement becomes primarily normative, backed by monitoring rather than treaty-authorised inspections.[128]

The implication for Chapter 3 is therefore straightforward. Treaty-based disarmament has not only ‘ended’ in a legal sense; it has lost its capacity to serve as the central organising mechanism for stability and legitimacy across the nuclear order. What comes next is governance by fragments: partial transparency, voluntary caps, technology-specific risk reduction, and competing legitimacy narratives. The crucial analytical question is whether these fragments can stabilise strategic competition, or whether they merely postpone a deeper fragmentation of the global arms control order.[129]

CHAPTER 4

THE RISE OF A POST-TREATY WORLD

The progressive erosion of bilateral nuclear arms control treaties has not produced a pure governance vacuum but a reconfigured landscape in which regulation takes the form of partial rules, informal arrangements, and competitive hedging among multiple nuclear-armed states.[130] Instead of integrated, legally binding regimes with precise counting rules and intrusive verification, today's order is marked by overlapping institutions, minilateral coalitions, unilateral steps, and risk-reduction tools that collectively but unevenly substitute for traditional arms control.[131] Scholarship on regime complexes, contested multilateralism, and institutional differentiation offers a useful lens for understanding this transition: arms control has become embedded in a broader pattern where dense but fragmented governance replaces the hierarchical treaty architectures of the late Cold War and immediate post-Cold War period.[132]

From Treaty-Centric Governance to Regime Complexity

Classical arms control during the Cold War was anchored in a relatively coherent set of bilateral treaties between the United States and the Soviet Union that established numerical limits, verification procedures, and agreed categories of strategic systems.[133] These agreements, although incomplete, generated predictability by codifying 'rules of the game' and embedding them in legal frameworks backed by domestic and international legitimacy.[134] As key instruments have lapsed, been suspended, or been narrowed, the institutional field has shifted toward what regime-complex theory describes as a loosely coupled set of partially overlapping institutions and practices without a clear centre of authority.[135]

Henning's work on hierarchy and differentiation in regime complexes underscores how states navigate such fragmented structures by selectively engaging different venues and instruments to pursue their interests.[136] In the arms control domain, this means that management of nuclear risks now occurs across a wide variety of sites, UN bodies, alliances, ad hoc coalitions, regional CSBM regimes, and technical expert networks, rather than primarily through a small number of comprehensive treaties.[137] The result is a post-treaty world that is simultaneously thinner in legalised constraint yet thicker in institutional density, complicating both coordination and accountability.[138]

Typology of Post-Treaty Governance

A. Unilateral and Reciprocal Political Commitments

One central building block of post-treaty governance is the use of unilateral and reciprocal political commitments, steps that are politically but not legally binding, often undertaken without a negotiated treaty text.[139] The Presidential Nuclear Initiatives (PNIs) of 1991-92 are the canonical precedent: through parallel unilateral declarations, Washington and Moscow withdrew large numbers of tactical nuclear weapons from deployment, cancelled certain systems, and altered alert postures without codifying these measures in a legally binding agreement.[140] The PNIs removed or deactivated thousands of warheads and delivery systems, yet they lacked formal verification provisions and rested primarily on reciprocal restraint and national technical means.[141]

In the contemporary environment, analogous tools include unilateral testing moratoria, self-imposed ceilings on specific classes of delivery systems, declared reductions beyond treaty limits, or geographically bounded non-deployment pledges.[142] UNIDIR's work on unilateral disarmament steps highlights how such measures can be framed as 'gifts' to the international community and as confidence-building moves, even though they do not generate legally enforceable obligations.[143] Their attraction lies in their speed and flexibility: governments can tailor them to domestic political constraints and reverse them if the security environment deteriorates, a feature that is much more difficult with ratified treaties.[144]

The downside is obvious: because these measures are reversible and lack embedded verification, they provide weaker assurances of durability and are more vulnerable to suspicion that restraint is temporary or conditional.[145] Empirical analyses of arms control design suggest that while unilateral steps can unlock political blockages and demonstrate good faith, they rarely provide the long-term predictability associated with formalised agreements and may even encourage strategic hedging if counterparts doubt their permanence.[146]

B. Minilateral 'Clubs' and Functional Coalitions

A second component of post-treaty governance is the proliferation of minilateral groupings or 'clubs' that coordinate positions, exchange information, and develop

agendas outside universal treaty frameworks.[147] Keohane and Victor's analysis of club governance in regime complexes shows that small-N coalitions are attractive because they can produce tailored 'club goods', such as specialised transparency measures or verification projects, for a subset of states with shared interests, even when broader multilateral negotiations are stalled.[148]

In the nuclear field, the P5 process among the five NPT-recognised nuclear-weapon states and the Stockholm Initiative for Nuclear Disarmament exemplify this trend.[149] The P5 Process, conducted under NPT auspices, provides a forum for dialogue on doctrines, transparency measures, and potential risk-reduction steps among the major nuclear powers, responding in part to pressure from non-nuclear-weapon states.[150] By contrast, the Stockholm Initiative, launched by a group of non-nuclear-weapon states, pursues a 'stepping stones' agenda centred on pragmatic risk-reduction and transparency measures intended to strengthen the NPT and pave the way for future disarmament progress.[151]

Official statements and ministerial communiqués from Stockholm Initiative meetings outline packages of practical measures, including national and multilateral commitments on transparency, declaratory policy, and nuclear risk reduction.[152] Government explanations of the initiative emphasise its role in reducing polarisation, promoting results-oriented disarmament diplomacy, and maintaining the centrality of the NPT in a contested environment.[153] Yet critics note that the multiplication of overlapping clubs risks diluting focus, enabling forum shopping, and further marginalising universal institutions such as the Conference on Disarmament or NPT review conferences.[154]

C. Transparency and Confidence-Building without Formal Limits

A third strand of post-treaty governance consists of transparency measures and confidence- and security-building measures (CSBMs) that do not impose numerical limits but aim to reduce misperceptions, surprise, and inadvertent escalation.[155] In Europe, the Vienna Document and the Treaty on Open Skies have historically formed the backbone of such regimes by institutionalising notifications of military activities, data exchanges on forces, on-site inspections, and cooperative aerial observation missions.[156] These arrangements, while formally less constraining than limitation

treaties, generated a dense flow of information that underpinned strategic stability and fostered habits of cooperation.[157]

Analyses by UNIDIR and SIPRI underline how Open Skies, in particular, created unique opportunities for cooperative aerial monitoring, allowing participants to observe each other's territory, verify force dispositions, and gain reassurance about troop movements.[158] As withdrawals and non-implementation have weakened these regimes, several European and transatlantic policy papers have called for revitalised CSBMs, including updated notification thresholds, new categories of reportable exercises, and possibly novel transparency measures for cyber or space activities, to adapt the concept to new technological and strategic realities.[159]

The foundational logic of CSBMs is elaborated in Krepon's classic handbook, which stresses that predictability and communication can be enhanced even without binding limits on capabilities.[160] However, such measures depend on political will and reciprocity; without a shared interest in predictability, notification and inspection regimes can quickly erode or be weaponised for intelligence-gathering without corresponding stabilising benefits.[161]

D. Crisis-Management Tools: Hotlines and Deconfliction Channels

A fourth element is the renewed emphasis on crisis-management tools, especially hotlines, deconfliction channels, and incident-prevention mechanisms, as core instruments for managing nuclear risk in the absence of strong formal constraints.[162] Steven E. Miller's detailed study of nuclear hotlines traces the development of the U.S.-Soviet hotline after the Cuban Missile Crisis and shows how the concept has been replicated and adapted by numerous nuclear-armed dyads and regional rivals.[163] Hotlines are designed to provide rapid, reliable, and confidential communication among leaders, enabling clarification of intentions, incident management, and de-escalation of crises that might otherwise spiral toward nuclear use.[164]

Empirical historical work on 'close calls' in nuclear history demonstrates how communication failures and misinterpretations have repeatedly brought states to the brink of nuclear escalation, reinforcing the perceived value of hotlines as 'firebreaks' between accident and catastrophe.[165] Contemporary analyses by think tanks and NGOs argue that hotlines must evolve to keep pace with modern information

technologies and be embedded in broader risk-reduction strategies, rather than treated as purely symbolic artefacts of the Cold War.[166]

Deconfliction arrangements in live theatres of operation illustrate how these tools function in practice: U.S.-Russia military-to-military hotlines for air operations over Syria, for instance, were established to avoid collisions, clarify flight paths, and prevent miscalculation amid intense military activity.[167] Carnegie analyses of the Syrian experience stress that such mechanisms can be maintained even among adversaries with severely strained political relations, but their effectiveness depends on agreed procedures, routinised use, and clear political backing.[168]

E. Normative Regimes, Taboos, and Reputational Constraints

Finally, normative regimes, shared expectations about acceptable behaviour, remain central to constraining nuclear use in a post-treaty world. The most prominent is the 'nuclear taboo, ' which Nina Tannenwald conceptualises as a powerful normative inhibition against the first use of nuclear weapons that has shaped state practice since 1945.[169] In both her book and earlier article, she argues that legal, moral, and reputational considerations have made nuclear use politically unthinkable in most circumstances, even when military planners considered it operationally advantageous.[170]

T. V. Paul's work debates whether this pattern should be understood as a robust taboo or a more contingent tradition of non-use, but likewise highlights the importance of expectations, identity, and reputational costs in shaping nuclear decision-making.[171] Public discourse, humanitarian campaigns, and the stigmatisation of weapons of mass destruction more broadly reinforce this normative environment, even as nuclear doctrines and postures have evolved. The broader treatment of nuclear weapons in the American Academy's project on the changing global order similarly emphasises how identity, status, and legitimacy inform debates about deterrence, disarmament, and responsible nuclear stewardship.[172]

Normative regimes intersect with institutional arrangements: participation in NPT review conferences, disarmament initiatives, and risk-reduction processes allows states to project an image of responsibility and moderation, generating reputational incentives to eschew certain behaviours even in the absence of binding treaty

constraints.[173] At the same time, as several analysts warn, norms are not self-enforcing and may erode under conditions of acute crisis, doctrinal shifts, or perceived existential threats, making their maintenance an active political project rather than a passive inheritance.[174]

Multipolarity and the Limits of Bilateral Arms Control

Beyond a Bipolar Strategic Picture

The exhaustion of U.S.-Russia bilateral treaties coincides with the consolidation of a more complex multipolar nuclear order in which several states, most notably China, are expanding and diversifying their nuclear forces outside any formal limitation regime.[175] SIPRI's assessments of global arsenals underline that while the United States and Russia still account for the majority of warheads, the growing capabilities of other nuclear-armed states have significant implications for strategic stability and arms control design.[176] Analyses of China's nuclear trajectory, including silo construction and the modernisation of delivery systems, suggest that Beijing has been able to exploit a 'legal vacuum' left by the demise of bilateral treaties to adjust its posture without binding constraints.[177]

This shift undermines the assumption that U.S.-Russia dyadic regulation can adequately capture the strategic picture, even if future bilateral understandings remain necessary for global stability.[178] Multiple nuclear dyads, including U.S.-China, India-China, India-Pakistan, and regional rivalries in East Asia and the Middle East, now contribute to deterrence dynamics, crisis risks, and arms competition in ways that are not easily addressed by traditional bilateral frameworks.[179] As a result, both scholars and policy analysts increasingly call for multilateral or at least multi-party approaches to arms control and risk reduction, even while acknowledging the political and technical obstacles.[180]

Nonstrategic Stockpiles and Blurred Categories

Multipolarity also accentuates the significance of nonstrategic nuclear weapons and dual-capable systems that fall outside the categories traditionally regulated by strategic arms treaties.[181] Analyses from FRS and other institutions show that theatre-range systems, air-delivered weapons, and sea-based nonstrategic assets

remain largely unconstrained, especially in Europe and Asia, despite their prominent role in regional deterrence and escalation ladders.[182] Technological developments, such as hypersonic glide vehicles, advanced conventional precision-strike systems, and emerging cyber-nuclear interactions, further blur the line between 'strategic' and 'tactical', complicating any attempt to establish stable counting rules.[183]

These challenges help explain why attempts to multilateralise or broaden traditional arms control concepts have struggled: verification of dispersed nonstrategic stockpiles is technically demanding and politically sensitive, particularly when alliance politics and forward-deployed systems are at stake.[184] As a result, many proposals focus on incremental steps, such as regional transparency measures, notifications, or geographic deployment restraints, rather than comprehensive treaties encompassing all categories of nuclear forces.[185]

Strategic Hedging and Competitive Hedging

Under conditions of uncertainty about others' capabilities and intentions, states increasingly adopt strategies of strategic hedging: investing in flexible force structures, modernisation programs, and latent expansion capacity while avoiding binding long-term constraints.[186] Policy analyses of the post-New START environment argue that both Washington and Moscow, as well as other nuclear powers, are keeping options open for future adjustments in response to each other and to third parties, rather than seeking new legally binding ceilings.[187] Reddie's study of institutional design and compliance in arms control suggests that, in such environments, states tend to favour less intrusive, more flexible arrangements, such as political commitments and limited-scope agreements, over comprehensive treaties that might lock in disadvantageous force ratios.[188]

However, when multiple states simultaneously hedge, the outcome can resemble an arms race, even if each actor individually frames its actions as defensive or precautionary.[189] SIPRI and other monitoring institutions document renewed modernisation cycles and qualitative improvements across several nuclear arsenals, reinforcing perceptions of competitive dynamics.[190] In the absence of shared benchmarks of sufficiency or agreed ceilings, these dynamics risk producing

open-ended competition, only partially mitigated by informal governance mechanisms.[191]

Institutional Displacement and Forum Shifting

Regime Shifting and Deflective Cooperation

The shift from treaty-based arms control to fragmented governance is part of a broader pattern of regime shifting and contested multilateralism.[192] Keohane and Morse describe how dissatisfied states or coalitions increasingly respond to deadlock in one institution by creating or empowering alternative venues, thereby changing the balance of authority within a regime complex.[193] Zangl, Heußner, and Kruck's concept of 'deflective cooperation' similarly emphasises how powerful states may use new forums to deflect pressure or reframe issues without fully resolving underlying conflicts.[194]

In arms control, such dynamics are evident in the proliferation of initiatives and forums addressing overlapping aspects of nuclear governance: the NPT review process, the UN General Assembly First Committee, regional organisations, the P5 Process, the Stockholm Initiative, and numerous Track 1.5 and Track 2 dialogues.[195] Some of these venues serve primarily as platforms for norm entrepreneurship and agenda-setting; others function as pragmatic working groups for technical cooperation and risk-reduction measures.[196] The resulting institutional complexity reflects both creative problem-solving and strategic forum shopping.[197]

UN-Centred Institutions versus Alliances and Coalitions

UN-centred institutions remain symbolically central to the nuclear order, but their practical capacity is constrained by great-power rivalry, veto politics, and diverging threat perceptions. The Security Council's limited ability to respond to compliance controversies and the chronic paralysis of the Conference on Disarmament illustrate these constraints. Consequently, many substantive decisions about nuclear posture, extended deterrence, and risk reduction are increasingly made within alliances and coalitions where membership is restricted to like-minded states. [198]

NATO, U.S. bilateral alliances in Asia, and ad hoc coalitions have become critical arenas for negotiating nuclear sharing, declaratory policy, and crisis-management

measures among partners.[199] Official NATO and allied documents emphasise internal consultation mechanisms, nuclear planning groups, and alliance-level risk-reduction discussions as key tools for maintaining credibility and control in the absence of robust global treaties.[200] Similarly, foreign ministry statements on the Stockholm Initiative highlight how like-minded coalitions seek to shape NPT outcomes and global norms through coordinated positions and joint proposals.[201]

Issue-Specific Groupings and Functional Governance

Issue-specific groupings also play an increasingly important role in functional governance.[202] The Nuclear Security Summits pioneered the use of voluntary 'house gifts' and 'gift baskets' to generate concrete commitments on nuclear material security outside treaty-making, a model that has influenced disarmament and risk-reduction initiatives.[203] The Stockholm Initiative and related efforts build on this logic by promoting specific 'stepping stones' toward disarmament, such as transparency projects, doctrinal dialogues, and verification experiments, that can be adopted by subsets of states willing to move forward.[204]

Government websites and official statements on the Stockholm Initiative stress its aim of reducing polarisation, strengthening the NPT, and advancing concrete risk-reduction packages through ministerial coordination, working groups, and outreach to nuclear-weapon states.[205] At the same time, some observers worry that the multiplication of such groupings may privilege well-resourced states and marginalise those lacking the capacity to engage in many parallel processes, potentially reinforcing inequalities in representation and agenda-setting power.[206]

What Is Lost and What Is Retained

Predictability, Verification, and Constraint

The most visible loss in a post-treaty world is the decline of institutionalised predictability, verification, and constraint traditionally provided by comprehensive bilateral agreements.[207] Treaty regimes such as earlier strategic arms limitation and reduction agreements typically contained detailed counting rules, cooperative monitoring provisions, and formal mechanisms for consultation and dispute resolution that collectively reduced uncertainty about adversary capabilities.[208] With their expiry

or suspension, states rely more heavily on national technical means, open-source intelligence, and ad hoc information sharing, increasing the potential for misperception and worst-case assumptions.[209] Verification regimes built around on-site inspections, data exchanges, and cooperative aerial observation, illustrated by Open Skies and associated CSBMs, also served as laboratories for technical innovation and trust-building.[210] As these erode, transparency becomes a matter of unilateral disclosure or limited political commitments, which can be withdrawn or narrowed with fewer reputational and legal costs.[211] Reddie's work on institutional design emphasises that informal arrangements generally lack the robust compliance mechanisms and audience costs associated with treaty violation, reducing their deterrent effect against opportunistic behaviour.[212]

Flexibility, Ambiguity, and Hedging

What states gain, however, is flexibility in adjusting posture and policy without being locked into rigid legal formulas. Informal governance allows governments to calibrate commitments to evolving threat perceptions, technological developments, and domestic politics, adjusting or rescinding measures when they are judged disadvantageous.[213] For rising powers or states dissatisfied with earlier arms control agreements, the absence of new binding treaties preserves room for growth, modernisation, and bargaining leverage.[214] Ambiguity can also be strategically useful: doctrinal flexibility, opaque stockpile numbers, and uncertain deployment patterns may be seen as contributing to deterrence by complicating adversary planning. Yet the same ambiguity complicates crisis signalling and risk-reduction efforts, increasing the danger that actions intended as limited deterrent moves are interpreted as preparations for rapid escalation or breakout.[215] Analysts of hotline practice and risk-reduction tools argue that as treaty-based predictability declines, the importance of communication, incident-prevention, and crisis-management mechanisms rises sharply, creating new demands on political and military leadership.[216]

Enduring Norms and Institutional Legacies

Despite institutional change, key norms and structures of the nuclear order remain intact.[217] The NPT continues to function as the cornerstone of the global non-proliferation regime, underpinning safeguards, export controls, and

nuclear-weapon-free zones.[218] The nuclear taboo, or tradition of non-use, while subject to debate over its strength and durability, still appears to exert significant influence on leaders' calculations in potential nuclear crises.[219] Many tools of post-treaty governance are, in fact, extensions or repurposings of instruments developed in the heyday of arms control: CSBMs, hotlines, track-two dialogues, and verification experiments all have deep roots in earlier practice. The difference is that these instruments now bear a greater burden of risk management and stability maintenance, often without the legal scaffolding and compliance mechanisms of comprehensive treaties.[220] This suggests that, rather than speaking of a purely 'post-arms-control' world, it is more accurate to describe a transformation in the forms and venues through which arms-control functions are performed.

Toward Technologically Driven Post-Treaty Governance

The rise of post-treaty governance is not only a political consequence of multipolarity and institutional contestation; it is also driven by technologies that blur categories, compress decision time, and complicate traditional counting rules. Hypersonic delivery systems, dual-capable platforms, offensive cyber operations, autonomous systems, and increasingly sophisticated surveillance tools challenge the assumptions underlying classic arms control, in which discrete, easily countable strategic systems could be regulated through stable definitions and verification procedures. As these technologies mature, pressures toward informal, adaptive, and functionally targeted governance mechanisms are likely to intensify, further privileging political commitments, risk-reduction tools, and minilateral experimentation over universal, legally binding treaties. These developments set the stage for a deeper analysis of how emerging technologies reshape both the problems and instruments of arms control: by destabilising traditional metrics of sufficiency, undermining established verification concepts, and creating new pathways for inadvertent escalation that existing regimes are ill-equipped to manage. Understanding post-treaty governance, therefore, requires integrating technological change into the analysis of institutional evolution, a task taken up in the subsequent chapter.

CHAPTER 5

THE TECHNOLOGICAL DISRUPTION OF GLOBAL ARMS CONTROL

The architecture of international security, painstakingly constructed over decades of bipolar rivalry, is currently confronting an existential challenge that transcends traditional geopolitical friction. While the collapse of landmark treaties like the Intermediate-Range Nuclear Forces (INF) Treaty or the Open Skies Treaty is often attributed to political bad faith, a deeper structural analysis reveals that the primary catalyst for the erosion of these regimes is the rapid maturation of emerging and disruptive technologies (EDTs). [221]

These technologies do not merely represent marginal improvements in lethality or range; they fundamentally dismantle the foundational assumptions upon which classical arms control was predicated. For half a century, arms control was a hardware-centric endeavour, focusing on countable, observable, and geographically fixed systems.[222] The modern strategic environment, however, is defined by cross-domain integration, software-defined capabilities, and an inherent ambiguity that renders the 'unit of account' in traditional treaty-making increasingly obsolete.

The core of this disruption lies in the transition from a strategic landscape of clarity and linear escalation to one of entanglement and compressed decision-making. Classical arms control assumed that nuclear and conventional domains were physically and doctrinally distinct. It is assumed that sensors could provide definitive early warning and that verification could be achieved through physical inspections or satellite reconnaissance. Today, the convergence of hypersonic delivery vehicles, artificial intelligence (AI), offensive cyber capabilities, and counter-space weaponry has created a 'grey zone' of strategic stability where the distinction between a conventional skirmish and a nuclear prelude has all but vanished.[223] As we transition into a multipolar era unregulated by the types of agreements that governed the Cold War, the very definition of arms control must be reshaped, moving away from quantitative limitations on platforms toward normative regulation of behaviour and the establishment of global 'rules of the road.'[224]

The Obsolescence of Classical Foundations: From Hardware to Software

The classical model of arms control was built on the premise that strategic stability could be maintained by limiting the number of delivery vehicles, missiles, bombers, and submarines that each side possessed. This 'counting' logic was effective because these systems were large, required massive industrial infrastructure, and were relatively easy to identify via National Technical Means (NTM). A state's deterrent posture was, therefore, legible to its adversary. The New Strategic Arms Reduction Treaty (New START), which expired in 2026, represents the final vestige of this paradigm, focusing on a specific number of deployed warheads and launchers.

However, the current technological revolution shifts the locus of strategic power from observable hardware to opaque software and enabling algorithms. In the contemporary environment, a platform's capabilities can be fundamentally altered by a software patch or a change to its guidance system, neither of which can be detected by an overhead satellite. This shift creates a crisis of observability. When the primary determinant of a weapon system's effectiveness is its processing speed or the sophistication of its AI-driven targeting, traditional arms control mechanisms that rely on counting silos or airframes lose their utility.[225] Furthermore, the democratisation of these technologies means that high-end strategic capabilities are no longer the exclusive preserve of superpowers, as middle powers and even non-state actors leverage commercial AI, cyber tools, and drone technology to project power in ways that bypass traditional regulatory frameworks.[226]

Table 5.1: Classical Arms Control vs. The Modern Disrupted Environment

Feature	**Classical Arms Control (1960s-2010s)**	**Modern Disrupted Environment (2020s-Future)**
Verification Logic	On-site inspections and National Technical Means (satellite imagery)	Verification of algorithms, software, and digital supply chains
Unit of Account	Physical launchers and warheads	Operational effects and behavioural norms
Domain Focus	Primarily Terrestrial and Maritime	Cross-domain (Cyber, Space, AI, Electromagnetic)
Escalation Path	Linear, predictable ladder	Entangled, non-linear, and multi-vector

Actor Dynamics	Bipolar (US-Soviet/Russia)	Multipolar and Multi-stakeholder (including Private Sector)
Response Time	Minutes to Hours (Reflective Pause)	Seconds to Milliseconds (Compressed)

Source: Author's compilation from various sources

The integration of EDTs into the nuclear enterprise creates a new 'strategic ecosystem' in which every action is filtered through the lens of extreme uncertainty. This uncertainty is not an accidental byproduct of technological progress but a fundamental disruption mechanism that breaks the traditional feedback loops of deterrence. When states can no longer verify their rival's capabilities through traditional means, they are driven toward worst-case assumptions, fuelling a qualitative arms race that is far more difficult to arrest than the quantitative races of the twentieth century.[227]

Ambiguity and the Dual-Use Security Dilemma

The first major disruption mechanism is the pervasive ambiguity surrounding modern delivery systems. Historically, nuclear and conventional forces were largely separated by their delivery platforms. Today, the 'dual-use security dilemma' has emerged as a primary driver of crisis instability. This dilemma arises when a state deploys weapons systems capable of delivering both conventional and nuclear payloads, making it impossible for an adversary to determine the nature of a strike during its flight.[228]

Hypersonic Glide Vehicles (HGVs) and advanced cruise missiles epitomise this threat. These systems are designed to fly at ultra-high speeds within the atmosphere, utilising manoeuvrability to bypass existing ballistic missile defence (BMD) systems. Because they follow erratic flight paths rather than predictable ballistic trajectories, they deny the defender the ability to characterise the attack based on its destination or its likely warhead type.[229] This creates a condition of 'warhead ambiguity' that could lead to catastrophic miscalculation. If a state detects a hypersonic launch directed toward a high-value command centre, it may be forced to choose between a nuclear response or a pre-emptive strike, even if the incoming missile is armed with a conventional penetrator.[230]

The proliferation of these dual-capable systems is particularly destabilising in regional theatres like South Asia or the Taiwan Strait. In these contexts, the short geographic distances and the colocation of conventional and nuclear assets mean that a 'conventional' strike intended to destroy an adversary's air defence could inadvertently decapitate its nuclear command and control. This 'conventional counterforce' capability is a revolutionary departure from the Cold War era, where such tasks required nuclear weapons. The increased credibility of high-precision conventional weapons makes them more likely to be used, yet their use against strategic targets risks crossing an invisible nuclear threshold that neither side fully understands.[231]

The Evolution of Strategic Delivery

Table 5.2: The Evolution of Strategic Delivery Systems

System Type	Flight Path	Predictability	Primary Disruption
Ballistic Missile	Parabolic / Exo-atmospheric	High (Detection to Impact)	Quantitative Overload
Cruise Missile	Low-altitude / Aerodynamic	Medium	Stealth and Proliferation
Hypersonic Glide Vehicle	Atmospheric / Maneuverable	Low (Unpredictable)	Speed and Warhead Ambiguity
Autonomous Swarms	Distributed / Networked	Very Low	Defensive Saturation and Attrition

Source: Author's compilation from various sources

This ambiguity is further compounded by the 'colocation' of nuclear and non-nuclear forces. For instance, many states utilise the same communication hubs, radars, and airfields for both types of operations. During a conventional conflict, a state may target an adversary's satellite-guided navigation or its radar installations to gain a tactical advantage. However, because these systems are entangled with the nuclear enterprise, the target state may interpret the attack as a deliberate attempt to blind its nuclear deterrent, prompting a 'use-it-or-lose-it' escalatory response.[232]

Time Compression, Velocity Crisis and AI Decision Support

The second mechanism of disruption is the radical compression of decision-making time, driven by the combination of hypersonic speeds and AI-driven intelligence, surveillance, and reconnaissance (ISR). In the 1960s, leaders had roughly 20 to 30 minutes to verify a radar signal and deliberate on a response to an incoming ICBM launch. This 'reflective pause' was a crucial stabiliser of the nuclear age. Today, hypersonic missiles and the forward deployment of advanced sensors have reduced this window to mere minutes, while AI-enabled systems threaten to push human decision-makers out of the loop entirely.[233]

The integration of AI into military command and control is often marketed as a tool to improve situational awareness and reduce human error. However, the speed of AI-driven analysis creates a 'velocity trap.' As algorithms begin to process battlefield data at speeds far exceeding human cognition, commanders may feel pressured to delegate authority to automated decision support systems (DSS) to keep pace with an adversary. This leads to the risk of automation bias, where humans defer to the machine's recommendation without sufficient critical oversight, particularly in high-stress crisis scenarios where the perceived cost of hesitation is existential.[234]

Moreover, the interaction of two opposing AI systems could lead to 'algorithmic escalation.' If both sides employ AI to manage their defensive and offensive postures, a technical glitch, a misinterpreted signal, or a spoofing attempt could trigger a rapid series of machine-driven escalatory moves that outpace human leaders' ability to intervene. This scenario, effectively a 'flash crash' in the strategic domain, represents a profound challenge to the very concept of 'meaningful human control' over the use of force.[235]

Systemic Entanglement: Cyber and Space Threats to NC3

The third disruption mechanism is the structural entanglement of nuclear and non-nuclear systems, primarily manifesting in the cyber and space domains. Modern nuclear command, control, and communications (NC3) systems are no longer isolated 'hair-gapped' networks. They are increasingly digitalised, integrated into broader

military networks, and dependent on space-based assets that are themselves dual-use.[236]

Cyberspace has emerged as the ultimate domain for ‘asymmetric entanglement.’ An adversary may conduct an offensive cyber operation (OCO) against a state’s conventional infrastructure, such as power grids, logistics networks, or non-nuclear communication nodes, with the intent of achieving a non-kinetic tactical objective. However, due to the interconnected nature of modern military design, such an attack could inadvertently compromise elements of the NC3 enterprise. A cyber-intrusion into a dual-use satellite network could be interpreted by the victim as an attempt to neutralise its nuclear ‘brain,’ creating a dangerous pathway to nuclear escalation from a sub-conventional beginning.[237]

The Space-Nuclear Nexus

The space domain is perhaps the most vulnerable point of this entanglement. Almost all nuclear-armed states rely on satellites for early warning, attack characterisation, and secure communication with their triads. Yet, space is becoming increasingly contested, with the development of counter-space capabilities including kinetic anti-satellite (ASAT) missiles, electronic jamming, lasers, and co-orbital ‘stalker’ satellites capable of rendezvous and proximity operations (RPO).[238]

- Rendezvous and Proximity Operations (RPO): Dual-use robots designed for satellite servicing or debris removal can be used to manipulate or disable strategic assets. This creates an environment in which ‘peaceful’ manoeuvres are indistinguishable from hostile preparations.[239]
- The Problem of Attribution: Cyber and space attacks are inherently difficult to attribute in real-time. If a strategic sensor goes offline during a crisis, a leader must decide if the cause is a technical failure, a localised jamming attempt, or a deliberate ‘first salvo’ of a nuclear strike.[240]
- The Erosion of Sanctuary: The historic ‘sanctuary’ provided by the vastness of space or the depth of the oceans is being eroded by persistent loitering drones, underwater sensors, and AI-powered data fusion that makes tracking submarines and mobile launchers increasingly feasible.[241]

This entanglement breaks the ‘siloed’ approach to arms control. Traditional agreements focused on specific domains, limiting land-based missiles or banning weapons in space. However, when a cyber-attack in one domain can disable a nuclear

force in another, a more holistic and ‘cross-domain’ approach to security governance is required.[242]

Verification Limits: Governing the Opaque

Verification is the teeth of any arms control agreement, providing the confidence necessary for states to accept limits on their own power. However, the nature of new technologies creates a ‘verification wall’ that traditional methods cannot scale. The classical verification model assumed that if you could see the weapon, you could verify its existence and its constraints. In the age of AI, cyber, and software-defined warfare, this is no longer true.[243]

Software-defined systems pose a particular challenge. A drone, for instance, might be configured for non-lethal ISR today, but its mission could be changed to a lethal strike role via a digital update that leaves no physical trace. Similarly, AI algorithms are ‘black boxes’; an inspector cannot simply look at the code of an autonomous system and be certain that it does not possess prohibited features, especially when those features may only emerge through machine learning in an adversarial environment.[244]

The Crisis of Monitoring and Inspection

Traditional on-site inspections, which were a hallmark of the Cold War and the Chemical Weapons Convention, are becoming less effective and more difficult to negotiate:

- Intrusiveness vs. Security: States are increasingly reluctant to allow inspectors near their most sensitive digital infrastructure, fearing that verification will become a cover for cyber-espionage.[245]
- The Proliferation of the Small: The move toward ‘distributed lethality’, using swarms of small, inexpensive, and highly mobile drones rather than large, detectable platforms, makes counting and monitoring almost impossible.[246]
- Commercial Secrecy: Many of the technologies driving the current revolution are developed by private companies. These firms have proprietary interests that conflict with the transparency requirements of arms control, creating new legal and bureaucratic hurdles.[247]

To overcome these limits, researchers are exploring ‘tech-for-tech’ verification solutions. This includes the use of AI to analyse massive datasets from commercial satellites to detect anomalies in an adversary’s military posture, or the implementation

of hardware-based verification zones that use specific chips to physically lock out prohibited software functions. However, these technical fixes are themselves in their infancy and require international cooperation that is currently absent among the major powers.

The Dissolution of Boundaries: Strategic Defence/Offence Mixing

The final disruption mechanism is the mixing of offensive and defensive capabilities, which has historically been a primary driver of arms race instability. In classical strategic theory, a clear distinction was made between 'offensive' weapons (intended to strike) and 'defensive' systems (intended to protect). Arms control often sought to limit Defence (e.g., the 1972 ABM Treaty) to ensure that both sides remained vulnerable, thereby maintaining 'mutual assured destruction' (MAD) and reducing the incentive for a first strike.[248]

Today, this distinction has collapsed. Advanced missile Defence systems, such as the U.S. Terminal High Altitude Area Defence (THAAD) or the Russian S-400, utilise sophisticated radars that can also be used for offensive targeting or to monitor an adversary's conventional air movements.[249] Furthermore, space-based interceptors or high-powered lasers designed for 'Defence' against incoming missiles can just as easily be used as 'offensive' counter-space weapons to blind an opponent.[250]

The Impact of Integrated Defence on Strategic Stability

Table 5.3: The Offence-Defence Boundary in the Modern Era

Technology	Offensive Potential	Defensive Potential	Strategic Friction
BMD Systems	Enhances first-strike survival	Protects population and military hubs	Undermines 'Second Strike' logic
Counter-Space	Blinds the adversary (First Salvo)	Protects own satellites from interference	Weaponization of the 'Global Commons'
Precision PGMs	Conventional counterforce strike	Destroys incoming missiles / launchers	Blurs the nuclear/conventional line

Cyber OCO	Disables command and control	Neutralizes incoming cyber-threats	Constant, sub-threshold conflict

Source: Author's compilation from various sources

This blending creates a 'security dilemma 2.0.' When a state invests in strategic defence, its rival does not see a peaceful act of protection; it sees an attempt to gain the offensive capability to strike first and survive the retaliation. This leads to the deployment of more sophisticated offensive weapons, such as hypersonic or MIRVed (Multiple Independently Targetable Re-entry Vehicle) missiles, specifically designed to penetrate those defences, fuelling an unending cycle of qualitative escalation.[251]

Implications for Arms Control Design: A Shift Toward Behavioural Norms

The traditional hardware-reduction model of arms control is ill-suited for a world defined by ambiguity, speed, and entanglement. If the goal of arms control is to reduce the risk of war and enhance strategic stability, the paradigm must shift from limiting 'what' states have to regulating 'how' they use it. This implies a move toward behavioural norms, rules of the road, and transparency standards that address the functional reality of modern technology.[252]

The future of arms control design will likely be modular and behaviour-centric, focusing on the following areas:

- Non-Interference Norms for NC3: Establishing a global standard that cyber and kinetic attacks against nuclear command and control infrastructure are strictly prohibited, even in a conventional conflict. This would act as a 'firebreak' to prevent entanglement from leading to accidental nuclear use.[253]
- Transparency and Test Notifications: Formalising requirements for pre-launch notifications of hypersonic vehicles and 'notifications of manoeuvre' for satellites in proximity to other spacecraft. This would reduce the risk of misinterpreting a test or a technical manoeuvre as a hostile act.[254]
- Debris Bans and Environmental Stewardship: Building on the existing momentum to ban destructive direct-ascent ASAT testing, which creates long-lasting orbital debris. Such a ban protects the 'space commons' for both military and civilian users.[255]

- Incident Prevention and Crisis Communication: Modernising the ‘Hotline’ for the twenty-first century. This includes establishing dedicated channels for cyber deconfliction and space incident management, ensuring technical glitches can be clarified in real time before they escalate.[256]
- Responsible AI Guidelines: Developing international standards for the development and deployment of military AI, emphasising the maintenance of human-in-the-loop control over nuclear weapons and the implementation of rigorous testing and evaluation protocols.[257]

The Move Toward Modular Governance

Unlike the comprehensive treaties of the twentieth century, which took a decade to negotiate and were designed to last forever, modern arms control must be agile. This means moving toward minilateral and issue-specific arrangements:

- Political Declarations: Non-binding but high-level commitments (like the U.S. commitment on ASAT testing) that establish ‘best practices’ and can be quickly adopted by multiple states.[258]
- Codes of Conduct: Technical standards negotiated among military and scientific experts that define ‘responsible behaviour’ in specific domains like cyberspace or the Arctic.[259]
- Regional Confidence-Building Measures (CBMs): Tailored agreements between regional rivals (e.g., India and Pakistan) that address specific triggers of local instability, such as the colocation of dual-use assets.[260]

This shift does not replace the long-term goal of formal, legally binding disarmament. Instead, it provides the ‘connective tissue’ necessary to manage the immediate risks of technological disruption while political conditions for broader treaties are absent.[261]

The technological disruption of arms control marks the end of the ‘Golden Age’ of strategic stability and the beginning of a far more complex and dangerous era. The collapse of the old regimes is not a sign that arms control has failed, but that it has been outpaced by the very tools it was intended to regulate. As the major powers, the United States, Russia, and China, remain locked in a competitive struggle for technological dominance, the prospects for a new ‘Grand Bargain’ between them appear remote.[262]

However, this systemic breakdown creates a unique opportunity for middle powers. In a multipolar world, states with significant technological capacity but without the existential baggage of superpower rivalry can act as norm entrepreneurs. These middle powers are uniquely positioned to shape a modular, behaviour-based arms control architecture because they have a direct interest in preventing a conflict that would destroy the global technological and economic commons, such as the internet or satellite navigation, upon which their own rise depends.[263]

If arms control is to be reinvented as a modular, norm-based, and technology-aware regime, it will be the middle powers with credibility and convening capacity that lead the way. They can bridge the gap between the rigid legalisms of the past and the fluid realities of the future, establishing the frameworks that will keep the 'Doomsday Clock' from striking midnight in a digital age.[264]

The most critical case in this transition is India. As a rising major power with a long history of supporting global disarmament, a policy of 'networked strategic autonomy,' and a direct stake in the stability of the Indo-Pacific, India has emerged as a key shaper of these new norms. The next chapter will examine how India is leveraging its unique position to lead this middle power moment and stabilise a world disrupted by technology.

CHAPTER 6
THE INDIA WAY IN A POST-TREATY WORLD

The global nuclear order stands at a precipitous inflexion point in early 2026. The collapse of treaty-based strategic arms control, which had its roots in the late 1960s, signals the end of the post-Cold War 'regulated bipolarity' and the onset of an era defined by unconstrained multipolar competition. Within this vacuum, India occupies a structural position that is both unique and paradoxical. As a state that remains outside the Treaty on the NPT yet is increasingly integrated into the regimes and practices of global nuclear governance, New Delhi has transitioned from a historical advocate against the nuclear order to a contemporary norm entrepreneur and bridge actor.[265] This shift reflects a sophisticated reputation strategy centred on the identity of a responsible nuclear state, even as India grapples with acute strategic constraints, including a volatile nuclear trilemma with China and Pakistan, rapid technological disruptions, and evolving energy security requirements.[266]

India's Structural Position: The Hybrid Governance Model

India's contemporary standing in the global nuclear order is characterised by a hybrid status; it is a de facto nuclear-armed state that refuses the NPT's binary classification but increasingly adheres to its behavioural norms.[267] This structural position was formalised by the 2008 civil nuclear cooperation initiatives, which granted India a special case exemption from the Nuclear Suppliers Group (NSG) guidelines, allowing it to engage in civil nuclear trade without accepting full-scope International Atomic Energy Agency (IAEA) safeguards.[268]

Strategic Integration into Export Control Regimes

India has systematically aligned its domestic regulatory frameworks with the 'big three' multilateral export control regimes (MECRs), reinforcing its credentials as a responsible stakeholder. By 2018, India had secured membership in the Missile Technology Control Regime (MTCR),[269] the Wassenaar Arrangement,[270] and the Australia Group.[271] This integration serves a dual purpose: it facilitates access to advanced dual-use technologies and serves as a reputational buffer against its non-NPT status.

Domestically, India regulates its sensitive exports through the Special Chemicals, Organisms, Materials, Equipment, and Technologies (SCOMET) list. The 2025 update to the 'Regulation on Nuclear Export and Nuclear Import Control' further tightened procedures, mandating that items on the 'Nuclear Transfer Warning List' be permitted only if the recipient has a safeguard agreement with the IAEA.[272] This alignment with global standards is essential for India's 'Aatmanirbhar Bharat' (Self-reliant India) policy, as it allows the country to position itself as a trusted link in global high-tech supply chains. However, tensions remain; the 50,088 per cent growth in exports of CNC machine tools to Russia between 2022 and 2024 has invited increased Western scrutiny,[273] highlighting the challenge of balancing strategic autonomy with adherence to emerging, country-specific sanctions regimes.

The Safeguards and Additional Protocol Framework

India's engagement with the IAEA represents a cornerstone of its structural 'insider' status. Unlike NPT non-nuclear-weapon states (NNWS) that must accept comprehensive safeguards (CSA) on all nuclear material, India operates under an item-specific safeguards agreement (INFCIRC/754),[274] a unique umbrella arrangement concluded in 2009. This agreement allows India to separate its nuclear facilities into civilian (safeguarded) and strategic (unsafeguarded) programs. Plus, India is the only non-NPT state operating under an INFCIRC/66-type agreement to have an Additional Protocol in force, which allows the IAEA expanded rights of information and access to ensure the absence of undeclared nuclear activities within the civil sector.[275] This voluntary submission to intrusive monitoring is a critical component of India's strategy to be recognised as a responsible nuclear state while maintaining its sovereign right to a strategic deterrent.

Reputation Strategy: The 'Responsible State' Doctrine

India's nuclear identity is built on the pillars of restraint and responsibility, concepts deeply embedded in its strategic culture and declaratory policy. This strategy is designed to decouple India from the proliferator label often associated with non-NPT states, such as North Korea.

The Three Pillars of India's Nuclear Doctrine

Officially adopted in 2003, India's nuclear doctrine remains focused on deterrence rather than war-fighting. This is articulated through three core tenets: the first is No First Use (NFU), in which India pledges not to initiate a nuclear strike. This policy reflects India's cultural heritage of non-violence and serves as a vital risk-reduction measure in the volatile South Asian context.[276] The second tenet is Credible Minimum Deterrence (CMD), through which India seeks to maintain only the minimum arsenal necessary to inflict unacceptable damage in retaliation, explicitly eschewing an open-ended arms race.[277] The third tenet is Massive Retaliation; in the event of a nuclear attack on Indian territory or forces anywhere, India's response will be ‘massive’ and designed to inflict intolerable costs.[278]

Critics, particularly in the aftermath of the 2019 and 2025 crises, have questioned the continued viability of the NFU pledge. Statements by senior Indian officials suggesting that the future of the NFU ‘will depend on the circumstances’ have introduced a degree of strategic ambiguity.[279] Still, Indian strategic thought continues to view nuclear weapons primarily as ‘political tools’ rather than military ones, a perspective that distinguishes India from the Cold War superpowers.

The Responsible State Strategy in Action

India's reputation strategy is not merely rhetorical; it is backed by a voluntary moratorium on nuclear testing maintained since 1998, despite not being a signatory to the Comprehensive Nuclear-Test-Ban Treaty (CTBT).[280] Also, India has established a robust civilian-led command and control architecture, the National Command Authority (NCA),[281] ensuring that the decision to use nuclear weapons rests solely with political leadership.

Indian Strategic Constraints: The Southern Asian Trilemma

India's role as a norm entrepreneur is significantly circumscribed by the ‘Southern Asian trilemma’, a complex, interlocking security dynamic involving China, India, and Pakistan.[282] This trilemma is characterised by asymmetric capabilities, irredentist territorial disputes, and the induction of disruptive technologies that threaten to lower the nuclear threshold.

The China Factor: Systemic Competition and Capability Gaps

China remains the primary long-term driver of India's nuclear modernisation. Between 2024 and 2025, China's operational nuclear stockpile increased by 20%, reaching an estimated 600 warheads, with projections suggesting it could exceed 1,000 by 2030.[283] For India, this expansion creates a 'maximum test': to credibly deter China, New Delhi may be forced to enhance the qualitative yield of its warheads or increase its production rate, potentially moving away from its minimalist posture.[284]

Table 6.1: China-India Strategic Nuclear Comparison

Parameter	China (Est. 2025/2026)	India (Est. 2025/2026)	Strategic Implication
Warhead Count	~600	~180	Massive quantitative asymmetry; India focuses on survivability.
MIRV Tech	Deployed on ICBMs	Under development (Agni-V)	Increases 'first-strike' fears and counterforce pressures.
Sea Deterrence	Advanced SSBN fleet	Developing/Operationalizing INS Aridhaman	Enhances second-strike capability but introduces NC2 risks.
Hypersonic	DF-17 deployed	Testing K-6 hypersonic	Compresses decision times; threatens traditional missile defences.

Source: Author's compilation from various sources

The Sino-Indian relationship is further strained by the institutional penetration of South Asia by China, including the development of logistics facilities in Pakistan and economic ties with Sri Lanka and Nepal.[285] India's selective thaw with China in late 2024, evidenced by patrol agreements and the resumption of direct flights, is less an act of trust than a time management strategy to avoid simultaneous crises on two fronts.[286]

The Pakistan Dyad and the 2025 Crisis

While China is the systemic challenge, Pakistan remains the most immediate source of regional instability. The May 2025 crisis, triggered by a terrorist attack in Pahalgam, Jammu and Kashmir, that killed 27 people,[287] saw the most intense fighting between the two nuclear rivals in decades. India's 'Operation Sindoor' involved missile and drone strikes deep into Pakistani territory,[288] met by Pakistan's 'Operation Bunyan-un-Marsoos.'

This conflict demonstrated the 'escalation gone meta' phenomenon, where retaliatory moves become tied to historical narratives of mistrust, leaving virtually no buffer for de-escalation once thresholds are crossed. A central feature of the 2025 crisis was the superior performance of Chinese military hardware supplied to Pakistan, specifically the J-10C Vigorous Dragon jets and PL-15 air-to-air missiles, which reportedly downed Indian Rafale aircraft.[289] This moment in Chinese defence technology has significantly altered the conventional balance in the dyad, forcing India to rethink its dominance in escalation strategies.[290]

The Strategic Ceiling and Non-Nuclear Risks

A profound paradox has emerged in 2025: as nuclear weapons provide a strategic ceiling that deters total war, they have simultaneously created an opportunistic space for high-intensity conventional engagements. This stability-instability paradox[291] is intensified by the induction of Strategic Non-Nuclear Weapons (SNNWs), including AI-powered platforms, cyber-offensive measures, and precision-guided munitions.[292] The 2025 crisis marked the first instance of a parallel disinformation war that intensified war hysteria through AI-generated narratives, increasing the risk of miscalculation between India and Pakistan.[293]

Domestic Politics and Energy Security Implications

India's nuclear policy is inextricably linked to its domestic developmental goals. The Viksit Bharat vision for 2047 targets a developed nation status, requiring a tenfold increase in nuclear power capacity to 100 GW.[294] Key components of this strategy include the development of indigenous thorium-based reactors,[295] utilising India's vast thorium reserves to reduce dependence on imported uranium. Additionally, the

deployment of Small Modular Reactors (SMRs)[296] allows for compact, scalable units for faster rollout in remote regions, a technology India aims to lead in the Global South. Furthermore, the SHANTI Bill[297] legally reinforces the systems-oriented approach to baseload power and fuel diversification. However, this ambition remains constrained by international realpolitik. India's continued dependence on Russia's Rosatom for the Kudankulam reactors, and on discounted Russian crude oil (which reached 25.9% of imports in 2024), places New Delhi in a delicate position vis-à-vis Western sanctions,[298] forcing a multi-alignment strategy that is increasingly tested by the Gaza conflict and its expansion into a wider regional war.

The Post-START Architecture and Indian Resilience

The structural collapse of the strategic arms control architecture on February 5, 2026, was not an abrupt event but the culmination of nearly a decade of institutional decay. The New START served as the final legal buffer preventing a quantitative expansion of the strategic delivery systems and deployed warheads of the United States and Russia. Its expiration, occurring without a successor framework or even a temporary extension, has created a strategic vacuum that is being rapidly filled by three distinct but overlapping trends: the qualitative nuclear modernisation of the existing nuclear-weapon states (NWS), the emergence of a tripolar nuclear competition involving China, and the dissolution of the verification and transparency norms that underpinned Cold War stability.[299]

India's response to this ‘unconstrained’ environment is guided by its commitment to strategic autonomy, a principle that has evolved from a Cold War-era preference for non-alignment into a contemporary strategy of ‘multi-alignment’ or ‘de-hyphenation.’[300] In this new nuclear age, the Indian state is no longer a passive observer of the failures of the global order; rather, it is actively constructing domestic and regional ‘shields’ against global shocks.

Risk-Reduction Entrepreneurship

The failures of communication during the 2019 and 2025 crises between India and Pakistan have highlighted the need for institutionalised crisis communication. In response, India has begun a sweeping domestic revamp of its information network, abolishing siloed outreach in favour of a ‘Unified Outreach’ model.

India can credibly lead in socialising nuclear commanders across the trilemma to institutionalise global nuclear hotlines, moving beyond foreign minister-level links to secure, backup hotlines between supreme nuclear commanders, based on agreed SOPs that are insulated from domestic political pressures.[301] Also, India can champion de-alerting norms by advocating for the progressive de-alerting and de-targeting of nuclear forces in UN forums, drawing on its own history of recessed deterrence.[302] India can also promote nuclear fail-safe reviews through multilateral dialogues on fail-safe mechanisms to prevent inadvertent escalation caused by AI or cyber intrusions into NC3 systems.[303]

The Verification Deficit and Verification Entrepreneurship

The most immediate consequence of the end of New START is the permanent loss of the routine verification practices, including on-site inspections, telemetry sharing, and twice-yearly data exchanges, that provided predictability to the U.S.-Russia relationship.[304] This verification deficit is particularly dangerous in an era of dual-use delivery systems, where conventional and nuclear warheads can be interchanged on the same missile platforms.[305]

India has identified this gap as a primary area for its 'verification entrepreneurship.' While India has historically resisted intrusive inspections that could compromise its strategic (unsafeguarded) program, its stance has shifted toward supporting global standards for nuclear disarmament verification. In UN forums, India has consistently supported the consensus reports of the Group of Governmental Experts (GGE) on Nuclear Disarmament Verification (A/74/90 and A/78/120),[306] arguing that any future verification regime must strike a delicate balance between transparency and national security.

India's unique contribution to this debate is its proposal to study the Chemical Weapons Convention (CWC) as a model for universal, non-discriminatory verification.[307] The CWC represents a rare instance where a whole category of WMDs was successfully banned and eliminated through a rigorous, globally applicable inspection regime. By advocating for this model, India is attempting to shift the disarmament conversation away from the 'NPT apartheid' toward a universal

convention that applies equally to all nuclear possessors, thereby enhancing its own legitimacy while pressuring the N5 to commit to verifiable reductions.

The Rise of Middle Power Coalitions

The paralysis of the bilateral U.S.-Russia track has catalysed the formation of minilateral coalitions among middle powers that seek to reinvigorate arms governance. India, Japan, and Brazil have emerged as a critical trio in this regard. Each of these states brings a distinct normative perspective: Japan maintains its identity as the only nation to have suffered a nuclear attack, Brazil champions the Treaty on the Prohibition of Nuclear Weapons (TPNW) as an evolutionary leap, and India provides the realism required to engage with current possessors.

India's role within this middle-power framework is to reach a shared understanding on conventional missile technology. The logic here is to avoid the risky route taken during the Cold War, where the proliferation of conventional missiles frequently triggered nuclear alert cycles. By leading multilateral dialogues on missile restraint and risk reduction, India is attempting to build off-ramps from confrontation that are more flexible and responsive than the calcified UN machinery.[308]

Bridging Communities: Realism Meets Disarmament

India is perhaps the only actor that can credibly bridge the divide between the ‘Nuclear Traditionalists’ (those who view deterrence as essential) and the ‘Activists’ (those who support the TPNW).[309] This bridge actor role is supported by strategic realism, as India's insistence that disarmament must be step-by-step and anchored in security assurances resonates with other nuclear possessors. Additionally, India possesses Global South legitimacy by articulating the developmental and equity rights of the Global South, remaining a collective voice of resistance against the nuclear apartheid of the NPT. India's 2026 BRICS chairship[310] further offers a platform to shape a forward-looking agenda for inclusive global governance, integrating AI safety and risk reduction into a multipolar framework.

CTBT/IMS Diplomacy: Test Norm Reinforcement

Although India has not signed the CTBT, it effectively reinforces the non-testing norm through its voluntary moratorium.[311] In the post-New START era, the IMS remains the

world's most effective mechanism for monitoring qualitative arms racing. India can advance its norm-entrepreneurship by cooperating with the CTBTO and deepening technical cooperation with the IMS without a formal signature, thereby gaining the benefits of the verification network while maintaining its principled stand on a time-bound disarmament framework. India can promote regional norm-building by converting its unilateral moratorium into a regional 'non-testing' pact with Pakistan, a measure that would enhance regional security without sacrificing strategic autonomy.[312]

India and Legitimacy: The Equity Critique

A fundamental component of India's contemporary positioning is its 'equity critique' of the global nuclear order.[313] This critique is not merely polemic; it is a pressure tactic designed to address the perceived fairness, or lack thereof, of international governance structures.

Challenging the Hierarchy of 'Haves' and 'Have-Nots'

India has long argued that the NPT institutionalised a global hierarchy that legitimises nuclear weapons in the hands of five states while denying the same right to others, an 'organised hypocrisy'[314] that fails to accommodate the rise of new powers. This perception of unfairness was scarred into a generation of Indian leaders by the sanctions following the 1974 and 1998 tests.[315]

India continues to articulate a vision of 'Vasudhaiva Kutumbhakam' (The World is One Family), demanding universal disarmament by rejecting selective non-proliferation in favour of a universal, non-discriminatory ban on nuclear weapons.[316] India also demands sovereign equality, asserting that every country has the inherent right to decide its own security interests and access nuclear technology for peaceful development without discrimination. Furthermore, India advocates reforming global decision-making by seeking greater meaningful participation by Global South states in organisations such as the IAEA Board of Governors and the NSG, reflecting contemporary geopolitical realities.[317]

The Road Ahead: Agenda Setting in a Vacuum

As the 2026 NPT Review Conference (RevCon) approaches,[318] it does so in a world with no legally binding limits on nuclear stockpiles for the first time in fifty years. The lead-up has been characterised by institutional fatigue and a crisis of confidence in the disarmament pillar. In this volatile environment, India's role as a 'stabilising actor' is more meaningful than ever. New Delhi's potential as a bridge actor is best demonstrated by its ability to maintain relationships across various blocs, including the Quad, BRICS, and the Shanghai Cooperation Organisation (SCO).[319] By hosting rule-shaping conversations, such as the 2026 AI Impact Summit, India is elevating itself as a Global South leader capable of defining the norms for the 'Third Nuclear Age.'[320]

Table 6.2: India's Potential Leadership Actions in a Post-New START World

Domain	Potential Indian Leadership Action	Causal Impact
Post-New START	Lead minilateral dialogues on strategic stability among middle powers (Japan, Brazil, India).	Reinvigorates arms governance as U.S.-Russia frameworks weaken.
Verification	Champion the 'Chemical Weapons Convention Model' for nuclear warhead verification.	Demonstrates that credible multilateral disarmament is technically feasible.
Crisis Stability	Operationalise multilingual AI platforms for 'real-time narrative awareness' in Southern Asia.	Reduces war hysteria and miscalculation during border skirmishes.
Global South	Propose a 'Global Development Compact' that includes SMR technology sharing.	Aligns energy security with non-proliferation objectives.

Source: Author's compilation from various sources

India's contemporary positioning is defined by a hard-headed national perspective, the 'India Way', which stresses the need for greater realism and results-oriented diplomacy. However, this role is only meaningful if India can translate its normative strengths into a concrete policy menu that fits the constraints of a post-treaty world. As the focus shifts from bilateral arms control to multipolar risk management, India's unique structural position allows it to act as the architect of a more equitable and

resilient global nuclear order. This potential must be refined into specific policy prescriptions that address the vanishingly small margin for error in South Asia while pressuring the global regime to address its foundational fairness.

The ‘India Way’ in UN Forums

India's diplomacy in UN forums is characterised by the repeated tabling of two key resolutions: ‘Reducing Nuclear Danger’ (since 1998)[321] and a ‘Convention on the Prohibition of the Use of Nuclear Weapons’ (since 1982).[322] These resolutions are not merely symbolic; they are norm-setting tools designed to socialise the international community to the ‘hair-trigger’ alert risks of modern arsenals, pressure the recognised nuclear-weapon states to adopt No First Use (NFU) policies, thereby reducing the strategic salience of nuclear weapons, and advocate for a step-by-step process for disarmament that is universal, non-discriminatory, and verifiable.[323]

India views the NPT regime as a form of ‘organised hypocrisy’ that attempts to freeze the international distribution of power as it existed in 1967.[324] This perception of unfairness is amplified by the continued resistance to India's NSG membership, which is often viewed as a ‘distraction’ from the more important goal of using nuclear power for sustainable development.

In 2026, India's ‘equity critique’ has been refined into a more non-polemical, results-oriented strategy. Through its chairship of BRICS 2026 and its active role in the G20 Troika (alongside Brazil and South Africa), India is championing meaningful reforms of multilateral governance institutions. The demand is for a more agile, effective, and representative international system that reflects the contemporary realities of a multipolar world.[325] India's identity as a first responder to crises, both in its neighbourhood and beyond, is a core part of its bid for global legitimacy. By undertaking human-centric development projects and providing scalable, technology-enabled solutions for risk reduction, India is demonstrating that it can shoulder global responsibilities without accepting the discriminatory constraints of the NPT.[326]

India's unique structural position in 2026 allows it to act as a bridge actor in a world where the post-Cold War certainties have vanished. As a ‘responsible nuclear state’ that is both a non-NPT outsider and a governance insider, India is uniquely positioned

to lead in risk management, verification standards, and the articulation of an equity-based nuclear order.[327]

The ‘India Way’, characterised by a mix of hyper-pragmatic statecraft, hard-headed realism, and a commitment to universal norms, must now be operationalised. The following chapter will provide specific policy prescriptions for risk reduction in the Southern Asian trilemma, the institutionalisation of middle-power coalitions, and the technical pathways for verification entrepreneurship, ensuring that India's role as a norm entrepreneur is backed by a credible, actionable strategy.

CHAPTER 7

RECOMMENDATIONS AND CONCLUSION

The preceding chapters diagnosed the erosion of treaty-based arms control and the rise of a fragmented, post-treaty governance landscape; this chapter translates that diagnosis into a policy agenda organised by time horizon and governance level. Rather than attempting to revive the classical model, it assembles a pragmatic mix of politically binding measures, modular experiments, and long-term institutional reforms aimed at managing arms racing and inadvertent escalation under contemporary technological and geopolitical conditions.[328]

Immediate Agenda

1. Voluntary Ceilings and Mutual Transparency on Strategic Forces

At the bilateral and 'P3' (U.S.-Russia-China) level, the most urgent task is to prevent unconstrained quantitative competition in strategic systems once existing limits lapse or are suspended.[329] Building on proposals by Brooks, Acton and others, Washington and Moscow should announce parallel, politically binding commitments not to exceed their last treaty-notified deployed strategic levels for a defined interim period, even absent a follow-on treaty.[330] These voluntary ceilings would be accompanied by continued data exchanges and notifications derived from the New START template, perhaps via technical working groups or 'shadow' implementation mechanisms, even if formal inspection rights remain suspended.[331]

To engage Beijing without forcing premature formal parity, the P3 could adopt a 'floor-plus-ceiling' formula in which China publicly declares that it will keep its arsenal 'well below' the U.S.-Russian levels for a fixed period, in exchange for U.S. and Russian reaffirmations of their voluntary caps and commitments not to seek damage-limiting capabilities.[332] This would institutionalise a norm of restraint without requiring immediate trilateral numerical equality.

2. Restart and Extend Crisis-Communication Arrangements

Given crisis instability risks identified in historical hotline studies and recent U.S.-Russia deconfliction practice, all nuclear-armed dyads should ensure that secure

leader-level and military-to-military hotlines are operational, regularly exercised, and insulated from political retaliation.[333] At the multilateral level, states could establish an informal 'Crisis Communication Contact Group' of nuclear-armed states under P5 auspices to exchange best practices on protocols, language templates, and technical resilience, drawing on Miller's recommendations for institutionalising hotline usage beyond symbolic gestures.[334]

3. Near-term Transparency and CBMs in Space and Cyber

UNIDIR's cyber-nuclear studies and broader work on space norms highlight the acute escalatory risks posed by interference with early-warning satellites, NC3-relevant space assets, and nuclear-related digital infrastructure. As an immediate step, nuclear-armed states should adopt unilateral and then reciprocal public pledges not to conduct kinetic ASAT tests against satellites used for nuclear command, control, and early warning, building on the U.S. and allied moratoria and proposals at the UN Open-Ended Working Group on space norms.[335] In cyberspace, an initial package could include: (a) political commitments not to plant malware on NC3 networks in peacetime; (b) emergency incident-notification channels between relevant cyber authorities of nuclear-armed states; and (c) agreement to treat certain cyber intrusions into early-warning or launch-decision systems as categorically unacceptable, echoing recent UN cyber norms but specifying the nuclear context.[336]

4. Test-notification and 'No-Surprise' Norms for New Systems

Drawing on Cold War CBMs and contemporary hypersonic risk assessments, states should commit in the near term to prior notification of all flight tests of new long-range ballistic, cruise, and hypersonic systems above agreed range and speed thresholds.[337] At a minimum, these notifications would specify launch area, general trajectory sector (e.g., ocean impact zone), and approximate timing, without revealing sensitive performance data.[338] Regional dyads in Asia and Europe could additionally experiment with 'no-surprise' windows, mutual commitments not to conduct large-scale missile exercises near borders during defined crisis periods, to reduce misinterpretation of exercises as preparations for attack.[339]

Medium-Term Agenda

1. Modular Verification Pilots and Experiments

Given the political difficulty of negotiating full-scope verification regimes, the medium-term agenda should prioritise modular pilots that test verification concepts for specific objects, locations, or activities.[340] Building on experimental approaches pioneered in nuclear disarmament verification research and Dunn's risk-reduction agenda, states could launch small-scale cooperative projects focused on:

- Verified warhead-storage declarations at a single site;
- Portal monitoring for a subset of missile bases;
- Managed access inspections for selected nonstrategic nuclear storage areas.[341]

These pilots would be politically binding but non-treaty in status, with clear sunset clauses and evaluation criteria, allowing lessons to inform later, more formal frameworks.[342]

2. Agreement on Non-Interference with NC3

Technological trends described by Acton and others show that growing capabilities for cyber, kinetic, and co-orbital attacks on nuclear command, control, and communications risk 'escalation through entanglement.'[343] Over the 2-5-year horizon, nuclear-armed states should negotiate a politically binding code on non-interference with NC3, containing at least three elements:

- A shared functional definition of NC3 and associated space and cyber assets;
- A pledge not to deliberately target those assets with cyber or kinetic attacks in peacetime or early crisis;
- A mechanism for clarifying ambiguous incidents affecting NC3-relevant infrastructure (e.g., cyber incidents, unexplained satellite anomalies).[344]

This code could initially be elaborated in a P5 working group and subsequently opened to other nuclear-armed states, mirroring existing P5 process risk-reduction work but with a sharper operational focus.[345]

3. Hypersonic Test CBMs and Limits on Deployment Practices

As hypersonic weapons proliferate, the reports on regional analyses in South Asia and Europe warn that their speed, manoeuvrability, and ambiguous payloads intensify

‘use-or-lose’ pressures and increase misidentification risks.[346] In the medium term, key actors (United States, Russia, China, India, and selected U.S. allies) should adopt CBMs specific to hypersonics, including:

- Distinct test-trajectory corridors that avoid overflight of other nuclear-armed states;
- Commitments not to co-locate nuclear and conventional hypersonic systems at the same bases, where this would make discrimination impossible;
- Voluntary transparency on the nuclear or conventional status of deployed hypersonic systems in peacetime.[347]

Regional compacts, for example, among Asian actors engaged in hypersonic development, could experiment with moratoria on deployment of nuclear-armed hypersonics pending further evaluation of stability effects.[348]

4. Regional Missile Risk-Reduction Frameworks

Medium-term risk-reduction also requires region-specific approaches. European states, drawing on the CSBM tradition and on proposals from Stimson and SIPRI, could develop a ‘Missile Transparency and Risk-Reduction Regime’ including sub-regional notification thresholds, data exchanges on selected missile holdings, and optional reciprocal inspections of specified sites.[349]

In Asia, where ballistic and cruise missile competition is intense, regional dialogues (for example, under the ASEAN Regional Forum or dedicated Track-1.5 platforms) could pilot shared launch-notification centres or standardised NOTAM/NOTMAR formats for missile tests, with particular attention to the India-Pakistan and India-China dyads.[350] Such frameworks would be modular by design and could later be linked to broader global missile-governance efforts.

Longer-Term Agenda

1. Pathways to Treaty-like Frameworks

In the longer term, politically binding practices can crystallise into new treaty-like frameworks that capture some virtues of classical arms control without replicating its rigidities.[351] Drawing on Brooks’s broader conception of arms control as cooperative risk reduction, one pathway would be to codify sequences of previously tested CBMs and pilots into legally binding protocols, each covering a narrow functional area: NC3

non-interference, hypersonic deployment rules, non-kinetic ASAT restraints, or verified warhead-storage transparency.[352] These protocols would share common design features, verification templates, consultative mechanisms, and withdrawal clauses, but could be adopted à la carte by different coalitions, creating a layered architecture of obligations rather than a single comprehensive treaty.[353]

2. Multilateralisation Strategy Beyond the P5

Given the realities of a multipolar nuclear order, long-term arms control must reach beyond the U.S.-Russia dyad and the P5, but without creating unwieldy universal negotiations that risk paralysis.[354] Over time, key modules, such as NC3 non-interference or anti-ASAT test bans, could be translated into universal instruments, but only after technical and political feasibility has been demonstrated in smaller groups.[355]

3. Strengthening the NPT Review Process

To sustain the legitimacy of the NPT in a post-treaty world, the review process must be seen as more than a ritualised forum for restating entrenched positions.[356] Drawing on risk-reduction agendas articulated by Dunn, Williams, and others, states parties should:

- Institutionalise a dedicated 'Nuclear Risk-Reduction Segment' at each Review Conference and PrepCom, where nuclear-armed states present concrete progress on the kinds of measures outlined above;
- Mandate an intersessional working group on emerging technologies and nuclear risk, with participation from experts across regions and capabilities;[357]
- Enhance participation of non-nuclear-weapon states in verification-development initiatives (e.g., through a standing NPT-linked verification partnership), addressing long-standing complaints about exclusion from technical decision-making.[358]

Such reforms would not solve disarmament disputes, but they would anchor the post-treaty agenda in the treaty most central to the nuclear order.

India's Recommended Diplomatic Portfolio

For India, a state with growing capabilities, contested regional security dynamics, and strong non-proliferation credentials, a focused diplomatic portfolio could simultaneously advance national interests and broader stability. New Delhi is well placed to champion a 'South Asian missile-risk-reduction initiative' that combines advance notification of all ballistic and cruise missile tests (building on the existing ballistic-test notification regime) with exploratory discussions on extending notifications to hypersonic and longer-range systems as they emerge.[359] Regionally, India could promote an 'India-Pakistan-China dialogue on 'no-surprise' missile exercises' near sensitive borders and crisis theatres, framed as a pragmatic stability measure rather than a concession on capabilities.[360]

At the multilateral level, India could align with and help shape NC3 non-interference norms and cyber-nuclear risk-reduction initiatives, drawing on its growing digital and space profile to argue against cyber operations that threaten early-warning and command systems.[361] India can also position itself as a champion of verification innovation, participating in multilateral warhead-verification pilots and promoting Global South participation in such efforts under the NPT umbrella.[362] Taken together, this portfolio allows India to project itself as a responsible nuclear power, mitigate destabilising dynamics in its immediate region, and shape the emerging post-treaty governance architecture in ways consistent with its interests and identity as a leading voice of the Global South.[363]

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