

7. Nuclear Arms – International Relations / Organizations

Burevestnik missile – How Russia's new nuclear-powered weapon can change the arms race. Russia's test of the nuclear-powered Burevestnik missile and the US's decision to resume testing after 33 years are fueling a new arms race, undermining global treaties like the CTBT and New START. This technological escalation, joined by China's rapid arsenal growth, creates a volatile multipolar competition and forces nations like India to re-evaluate their "Credible Minimum Deterrence" posture.

Introduction – A Renewed Nuclear Arms Race

Recent events have reignited fears of a renewed global nuclear arms race, which is actively undermining decades of progress in arms control and disarmament. The primary triggers for this shift are –

1. Russia's successful test of the nuclear-powered Burevestnik missile.
2. The U.S. decision to resume nuclear testing after a 33-year moratorium.

The New Nuclear Race – Russia's Burevestnik and U.S. Policy Reversal

Russia's Technological Breakthrough (Burevestnik) – The Burevestnik (9M730 "Skyfall") is identified as a nuclear-powered, nuclear-armed cruise missile. It utilizes a miniaturised nuclear reactor for propulsion. Its design allows for low-altitude flight and unpredictable trajectories, making it extremely difficult to intercept. Russia claims the missile possesses an unlimited range. A critical test in October 2025 reportedly demonstrated its capability by flying 14,000 kilometres (8,700 miles) for approximately 15 hours. This test was conducted at altitudes as low as 50 to 100 metres, underscoring its ability to evade radar and missile defence systems.

U.S. Policy Reversal – The U.S. President's decision to resume nuclear testing has officially ended a 33-year self-imposed moratorium. This decision notably coincided with the President's meeting with the Chinese President, an event that has increased global nuclear insecurity.

Strategic Impact – These developments have revived a Cold War-style competition. Major powers, including Russia, China, and the United States, are accelerating their nuclear modernisation programs. This trend directly undermines the New Strategic Arms Reduction Treaty (New START). The erosion of this arms control framework significantly increases the risk of renewed strategic instability.

The Emerging Global Nuclear Order

Erosion of Post-Cold War Consensus – The long-held moratorium on nuclear testing and the diplomacy based on restraint are collapsing. This is occurring as nuclear powers actively innovate and develop new-generation weapons.

Rise of China's Arsenal – China's nuclear stockpile is undergoing a rapid and significant expansion. As of early 2024, China possesses an estimated 500–600 operational nuclear warheads. Projections indicate this stockpile is on track to exceed 1,000 warheads by 2030 and could potentially reach 1,500 by 2035. This expansion is intensifying the United States–China rivalry and fundamentally reshaping global deterrence dynamics.

Technological Multipolarity – The current environment signifies a shift toward multipolar nuclear competition, characterized by a multi-front technological arms race. Key examples of this new technological wave include –

1. Russia's Burevestnik nuclear-powered missile.
2. China's DF-41 Multiple Independently Targetable Reentry Vehicle (MIRV) missile.
3. The United States' development of Hypersonic Glide Vehicles (HGVs).

Factors Leading to a Renewed Global Testing Push

Technological Modernisation – Major powers are pursuing advanced weapons systems, including MIRVs, hypersonic glide vehicles (HGVs), and miniaturised warheads. These new technologies require validation through real-world, physical testing, which existing simulations cannot fully provide. Russia's Burevestnik and the U.S. plan to resume testing are direct reflections of this trend.

Erosion of Arms Control Frameworks – The weakening of the Comprehensive Nuclear-Test-Ban Treaty (CTBT). Grave uncertainty over the future of the New START Treaty, which is set to expire in February 2026.

This has led to a deep reduction in trust and a loss of faith in restraint-based diplomacy. The Non-Proliferation Treaty (NPT) is also facing a credibility erosion, largely due to perceived inequities between nuclear-weapon states and non-nuclear states.

Strategic Competition and Deterrence Signalling – The renewed U.S.–Russia–China nuclear rivalry is forcing smaller nuclear powers to reassess their own deterrence doctrines. China's rapid arsenal expansion (projected to hit 1,500 warheads by 2035) is a primary driver fueling this competitive escalation.

Domestic and Political Motives – Nuclear testing is often linked to demonstrating national prestige and technological self-assertion. It also serves as a powerful domestic political signal of national strength and independence.

Consequences of Resuming U.S. Nuclear Testing

Global Level

Breaks Long-standing Moratorium – The U.S. decision shatters the 33-year self-imposed moratorium, weakening the informal global restraint that had effectively halted live nuclear detonations since the end of the Cold War.

Legitimises Reciprocal Testing – This move provides political cover and justification for Russia and China to resume their own tests, which would fuel a new phase of nuclear modernisation and competitive validation of new warhead designs.

Weakens Arms Control Frameworks – It directly undermines the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and the global verification regime, including the International Monitoring System (IMS), which was designed to detect and deter testing.

Contradicts NPT's Disarmament Obligation – The decision runs counter to the spirit and letter of Article VI of the Non-Proliferation Treaty (NPT). Article VI mandates all parties, especially nuclear-weapon states, to negotiate in good faith to end the nuclear arms race and achieve complete nuclear disarmament. This erodes trust between nuclear and non-nuclear states, weakening the treaty's moral foundation.

Accelerates Technological Arms Race – It signals a definitive shift away from disarmament and towards technological brinkmanship, accelerating the race to develop hypersonic, tactical, and miniaturised nuclear weapons.

Regional Fallout (South Asia)

Potential Testing Cascade – The resumption of U.S. tests could trigger chain reactions in Asia. If China conducts tests to validate its MIRV and hypersonic systems, India and Pakistan may feel compelled to respond with their own tests to maintain deterrence.

Regional Parity and Escalation Risk – As of 2025, India has approximately 180 nuclear warheads, and Pakistan has about 170. While this indicates near parity, their doctrines are vastly different. Renewed testing by either side could dangerously disturb the strategic equilibrium and heighten escalation risks in a crisis.

Doctrinal Tensions – India maintains a policy of Credible Minimum Deterrence (CMD) and No-First-Use (NFU). This contrasts sharply with Pakistan's first-use posture (which reserves the right to use nuclear weapons first, potentially with tactical weapons). This doctrinal gap makes South Asia more prone to crisis instability if new rounds of testing begin.

Diplomatic Setback – Any resumption of testing by India would undermine its long-standing advocacy of restraint and disarmament, damaging its credibility as a responsible nuclear power.

Environmental and Diplomatic Implications

Environmental Hazards – Both underground and atmospheric tests can cause severe radioactive contamination of air, soil, and groundwater, leading to long-term health hazards and ecological degradation.

Historical Evidence of Damage – Past testing sites such as Nevada (U.S.), Semipalatinsk (Kazakhstan), and Lop Nur (China) continue to show persistent radiation effects and health problems in local populations decades later.

Erosion of U.S. Diplomatic Credibility – The move weakens Washington’s moral authority on non-proliferation and severely complicates negotiations for any future arms-control frameworks, such as a successor to New START or a Fissile Material Cut-off Treaty (FMCT).

Impact on Global Non-Proliferation Leadership – By resuming tests, the U.S. risks losing its role as a norm-setter in nuclear restraint, which reduces the overall momentum for global disarmament efforts.

Institutional Landscape of Nuclear Governance

Non-Proliferation Treaty (NPT, 1970) – Aims to prevent the spread of nuclear weapons, promote disarmament, and enable the peaceful use of nuclear energy.

Comprehensive Nuclear-Test-Ban Treaty (CTBT, 1996) – Bans all nuclear explosions (military or civilian). It has not officially entered into force due to incomplete ratification by key states.

New Strategic Arms Reduction Treaty (New START, 2011) – The last remaining bilateral treaty between the U.S. and Russia, capping their deployed strategic warheads and delivery systems. It is set to expire in February 2026.

Treaty on the Prohibition of nuclear weapons (TPNW, 2021) – A comprehensive treaty that prohibits the development, testing, and possession of nuclear weapons. (Not signed by any nuclear-weapon states).

Fissile Material Cut-off Treaty (FMCT, Proposed) – A proposed treaty to ban the production of fissile materials (like highly enriched uranium and plutonium) for nuclear weapons. India supports negotiations for this at the Conference on Disarmament (CD).

International Atomic Energy Agency (IAEA) Safeguards – The UN's nuclear watchdog, which monitors peaceful nuclear materials and ensures compliance with non-proliferation norms.

India’s Position on Key Nuclear Treaties and Frameworks

Treaty / Framework	Objective / Focus Area	India’s Status	India’s Stand / Rationale
Non-Proliferation Treaty (NPT, 1970)	Prevents spread of nuclear weapons and promotes disarmament	Not a Signatory	Views the NPT as discriminatory, as it legitimises only five nuclear powers. Advocates for universal, verifiable, and non-discriminatory disarmament instead.
Comprehensive Nuclear-Test-Ban Treaty (CTBT, 1996)	Prohibits all nuclear explosions for military or civilian use	Not Signed	Argues that the CTBT allows existing nuclear powers to retain and refine their arsenals (via simulation) without dismantling them. Seeks a time-bound global disarmament framework.
New Strategic Arms Reduction Treaty (New START, 2011)	Caps U.S.–Russia deployed warheads and delivery systems	Not a Party (Bilateral Treaty)	Supports global arms reduction, but calls for the inclusion of all nuclear-armed states for any framework to have a meaningful impact.
Treaty on the Prohibition of Nuclear Weapons (TPNW, 2021)	Bans development, testing, and possession of nuclear weapons	Not a Signatory	Believes in credible minimum deterrence (CMD) for its security. Advocates for abolition only under a universal, verifiable, and non-discriminatory regime.
Fissile Material Cut-off Treaty (FMCT, Proposed)	Prohibits production of fissile materials for nuclear weapons	Supports Negotiations	Endorses a non-discriminatory, verifiable FMCT within the Conference on Disarmament (CD) framework.
International Atomic Energy Agency (IAEA) Safeguards	Ensures civilian nuclear materials are not diverted for weapons	Implements Civil Safeguards Post-2008	Applies safeguards to its civilian nuclear facilities after the Indo–U.S. Nuclear Deal (2008) and supports peaceful nuclear energy under non-proliferation norms.

About India’s Nuclear Journey

Pokhran-I (1974) – Conducted on 18 May 1974 and codenamed “Smiling Buddha”, this test marked

India's entry into the nuclear club. It was officially described as a "peaceful nuclear explosion" (PNE). Strategically, it was aimed at ensuring technological sovereignty and establishing deterrence credibility. The test resulted in immediate international sanctions and India's exclusion from global nuclear commerce for decades.

Pokhran-II (1998) - Conducted on 11 and 13 May 1998 under "Operation Shakti". This involved a series of five underground tests, which included both fission and thermonuclear devices. Following these tests, India formally declared itself a nuclear weapons state, solidifying its strategic autonomy and minimum deterrence posture. While it also triggered international sanctions, this move later paved the way for negotiations and the eventual 2008 Indo-U.S. Civil Nuclear Agreement.

Strategic Legacy - The tests enhanced India's technological credibility and its policy of defence self-reliance. They were fundamental in shaping the evolution of India's nuclear doctrines - Credible Minimum Deterrence (CMD) and No-First-Use (NFU). They also highlighted the high cost of nuclear sovereignty, which included economic sanctions, enduring regional rivalry, and intense global scrutiny.

About India's Nuclear Doctrine

Core Principles - India's nuclear doctrine was formally articulated in January 2003. It is fundamentally built upon two pillars - Credible Minimum Deterrence (CMD) and No-First-Use (NFU). It commits India to using nuclear weapons only in retaliation to a nuclear attack on India or on Indian forces anywhere.

Credible Minimum Deterrence (CMD) Under Evolution - CMD is not a static number but a dynamic concept. It focuses on maintaining a capability sufficient to inflict unacceptable damage on an adversary, thereby deterring them. This doctrine is evolving in response to new threats, such as China's MIRV-equipped DF-41 missiles and Pakistan's Tactical nuclear weapons (TNWs). Consequently, India's deterrent posture now focuses on ensuring a survivable second-strike capability. This includes the development of canisterised missiles (for faster deployment) and a robust sea-based deterrence through the Arihant-class SSBN (nuclear submarine) fleet.

No-First-Use (NFU) Debate and Strategic Flexibility

Arguments for Retention - The NFU policy strengthens India's moral and diplomatic credibility, supports its aspirations to join the Nuclear Suppliers Group (NSG), and underlines its commitment to strategic restraint.

Arguments for Review - The threat from Pakistan's TNWs (which are designed for battlefield use) and China's advanced MIRV systems raises questions about the sufficiency of NFU. Some experts advocate for conditional flexibility under extreme circumstances.

Current Position - Officially, India continues to uphold the NFU doctrine, though senior policymakers have indicated the possibility of reviewing it if security dynamics evolve further.

Technological and Strategic Modernisation - To maintain the "credibility" of its minimum deterrence, India is -

1. Developing Agni-V and Agni-VI missiles, incorporating MIRV (Multiple Independently Targetable Reentry Vehicle) and MaRV (Maneuverable Reentry Vehicle) technologies.
2. Operationalising its Arihant-class SSBNs and expanding its Submarine-Launched Ballistic Missile (SLBM) capabilities (e.g., K-4 and K-5 series).
3. Strengthening its Command, Control, Communications, and Intelligence (C3I) networks to ensure robust control over its arsenal.
4. Enhancing its Ballistic Missile Defence (BMD) and Space Situational Awareness (SSA) systems for early warning.

Ethical and Strategic Balance - India strives to maintain strategic readiness while practicing ethical restraint. It simultaneously advocates for global disarmament while ensuring it has a credible deterrent against the dual nuclear threats from China and Pakistan.

Ethical Perspective on nuclear weapons and Disarmament

Moral Paradox - Nuclear weapons function as tools of deterrence (preventing war) but simultaneously pose existential threats to humanity. This challenges fundamental moral principles of jus in bello (justice in war) and responsible state conduct.

Ethics of Deterrence – The very idea of achieving peace through fear contradicts Gandhian and humanist ethics. It raises a profound question – can security built on the threat of mass destruction ever be morally justifiable?

Humanitarian Responsibility – The catastrophic human suffering of Hiroshima and Nagasaki serves as a permanent reminder of the ethical limits of state power. It underscores that technological progress without compassion leads to devastation.

India's Ethical Posture – India's No-First-Use (NFU) and Credible Minimum Deterrence (CMD) doctrines reflect a conscious effort to balance national security with moral restraint, embodying a responsible and non-aggressive nuclear philosophy.

Global Moral Dilemma – The renewed push for nuclear testing erodes the ethical foundation of post-war disarmament, replacing dialogue with force. The pressing challenge for humanity is to reconcile technological capability with moral accountability to ensure global peace and survival.

India's Strategic Concerns and Implications

Dual-Front Nuclear Pressure – India faces simultaneous nuclear challenges from China's MIRV-capable arsenal on one front and Pakistan's Tactical nuclear weapons (TNWs) on the other. Both adversaries, in different ways, threaten India's second-strike survivability and the credibility of its NFU posture.

Deterrence Credibility and Modernisation – India is compelled to sustain its Credible Minimum Deterrence (CMD) through continuous technological upgrades. Key focus areas include –

1. Agni-V and Agni-VI missiles equipped with MIRV and MaRV technologies.
2. Expansion of the Arihant-class SSBN fleet and the K-4, K-5 SLBM systems.
3. Strengthening C3I (Command, Control, Communications, Intelligence) and BMD (Ballistic Missile Defence) systems.

Economic and Strategic Balancing – This modernisation drive creates the classic "guns vs. butter" dilemma. Defence spending on high-cost nuclear systems must be balanced so as not to compromise social and developmental objectives (e.g., health, education). Fiscal discipline is crucial to maintain stability between security and welfare imperatives.

Diplomatic and Moral Posture – India's No-First-Use (NFU) policy is a key diplomatic asset, reinforcing its image as a responsible nuclear power and enhancing its credentials for NSG membership. However, renewed global testing by other powers threatens to undermine the diplomatic advantage India gains from its restraint.

Strategic Autonomy and Regional Stability – India must navigate a path that safeguards its strategic autonomy while avoiding entanglement in the intensifying U.S.–China strategic rivalry. A proactive role in promoting IAEA safety norms, South Asian confidence-building measures, and global NFU advocacy can help preserve regional stability.

Socio-Economic and Environmental Governance

The Guns vs. Butter Dilemma

Resource Diversion from Development – Escalating nuclear modernisation and defence spending create a "guns vs. butter" trade-off. Investments in warhead upgrades and missile systems may divert critical funds from education, healthcare, and climate adaptation.

Opportunity Cost for Emerging Economies – For developing nations like India, excessive defence spending risks undermining human capital growth and commitments to Sustainable Development Goals (SDGs).

Environmental and Human Safety Concerns

Peacetime Nuclear Risks – The 2019 Nyonoksa explosion in Russia, which occurred during a missile test (believed to be Burevestnik), highlighted that even non-war testing of nuclear propulsion systems carries significant radiation exposure risks and environmental hazards.

Potential Civilian Fallout – Accidents or leaks at nuclear test sites or research facilities can cause long-term contamination of air, soil, and groundwater, threatening public health.

Historical Lessons – Major nuclear accidents like Chernobyl (1986) and Fukushima (2011) demonstrate the devastating and persistent impact of nuclear incidents, reinforcing the need for robust civilian safety

and emergency preparedness.

Strengthening Global Oversight and Governance

Expanding IAEA's Role – The International Atomic Energy Agency (IAEA) should broaden its mandate to include monitoring of nuclear propulsion safety, radiation control during all forms of testing, and transparent reporting of nuclear incidents by all states.

Environmental Accountability – Establishing a global nuclear safety and environmental accountability framework, supervised by the UN and IAEA, would enhance trust, transparency, and rapid response capacity in case of accidents.

National-Level Preparedness – India must reinforce the role of its Atomic Energy Regulatory Board (AERB) in enforcing strict safety audits, radiation management protocols, and public disclosure norms to maintain both technological confidence and civilian safety.

Challenges Associated with Nuclear Testing

Environmental and Health Risks – Tests can cause widespread radioactive contamination of air, water, and soil, leading to long-term ecological consequences. Past test sites like Semipalatinsk (Kazakhstan) and Nevada (USA) still show high rates of radiation-linked health issues.

Verification and Compliance Gaps – So-called "subcritical" tests or advanced computer simulations can exploit loopholes in the CTBT, making detection and verification difficult. Inadequate international oversight mechanisms allow for covert capability advancements.

Diplomatic and Normative Erosion – Resumed testing directly undermines NPT and CTBT norms, weakening the global disarmament momentum built over decades. States that test risk international sanctions, isolation, and a significant loss of moral standing in global forums.

Economic and Strategic Trade-offs – Testing programs demand immense financial resources, which may be diverted from developmental priorities like health, education, and infrastructure. Regional testing can spark spiraling arms races, especially in volatile zones such as South Asia.

Way Forward

Global Level Actions – Urgently initiate a U.S.–Russia–China trilateral arms control dialogue before the New START treaty expires in 2026. Promote the adoption of a Fissile Material Cut-off Treaty (FMCT) and a verified global testing moratorium that also covers subcritical tests.

National Level Actions (India) – Retain the NFU doctrine as a moral and diplomatic anchor, while simultaneously upgrading MIRV, MaRV, and C3I infrastructure to ensure deterrence credibility. Strengthen Ballistic Missile Defence (BMD) and Space Situational Awareness (SSA) for early threat detection. Enhance domestic nuclear safety frameworks under the supervision of the AERB.

Diplomatic Level Initiatives – Lead an advocacy campaign for a collective global NFU commitment from all nuclear-weapon states. Strengthen hotline communication mechanisms in South Asia and promote IAEA-backed safety conventions to prevent accidental escalation. Reinforce India's leadership role in the Global South for responsible modernisation and disarmament advocacy.

Conclusion

India's nuclear path, from Pokhran to the present day, has been a continuous effort to balance sovereign security with responsible restraint. Amidst a renewed era of global testing and arms racing, India must navigate a difficult path – it must sustain credible deterrence, ethical leadership, and technological readiness. At the same time, it must work to preserve diplomatic balance in an increasingly volatile and multipolar world.

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