



NUCLEAR DETERRENCE IN THE AGE OF PRECISION AND SPEED: HYPERSONIC GLIDE VEHICLES, COUNTER-FORCE VULNERABILITIES AND THE ESCALATION LOGIC OF NON-STRATEGIC NUCLEAR WEAPONS

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ABSTRACT

Nuclear deterrence in the twenty-first century is being transformed by the interaction of speed, precision, ambiguity and lower-yield nuclear options. The traditional logic of mutually assured destruction rested on the assumption that nuclear-armed adversaries possessed survivable second-strike capabilities and therefore had strong incentives to avoid nuclear war. However, the development of hypersonic glide vehicles, long-range precision-guided conventional weapons, advanced surveillance systems, cyber capabilities and non-strategic nuclear weapons has complicated this logic. Hypersonic weapons compress decision-making windows by reducing warning time, manoeuvring unpredictably and creating uncertainty about payload, target and intention. Precision-guided conventional counter-force capabilities create new anxieties because they may threaten nuclear command-and-control systems, mobile missiles, air bases, submarine infrastructure and other assets connected to second-strike survivability. Non-strategic nuclear weapons further complicate deterrence because their lower yields and regional battlefield roles may create the illusion of controlled nuclear use. This article analyses how these developments reshape strategic stability, undermine traditional deterrence assumptions and increase escalation risks in regional and great-power crises. It argues that modern deterrence is no longer based only on the possession of nuclear weapons; it increasingly depends on the survivability of command systems, the credibility of restraint, the management of dual-use ambiguity and the preservation of decision time. The article concludes that the age of precision and speed has not abolished deterrence, but it has made deterrence more fragile, more technologically dependent and more vulnerable to misperception.

KEYWORDS: Nuclear deterrence, hypersonic glide vehicles, strategic stability, counter-force targeting, counter-value targeting, non-strategic nuclear weapons.

INTRODUCTION

Nuclear deterrence has traditionally rested on a paradox: nuclear weapons are politically useful mainly when they are not used. Their function is to prevent war by threatening unacceptable retaliation. During the Cold War, the concept of mutually assured destruction emerged from the belief that if both adversaries retained survivable second-strike forces, neither could rationally initiate nuclear war without facing catastrophic retaliation. Deterrence therefore depended less on the ability to win a nuclear conflict and more on the impossibility of escaping unacceptable damage.¹

The twenty-first-century strategic environment has disturbed this logic. Nuclear powers are no longer dealing only with large ballistic missiles, strategic bombers and submarine-launched ballistic missiles. They are now integrating hypersonic weapons, cyber operations, artificial intelligence, long-range precision conventional strike, missile defence, space surveillance and lower-yield nuclear options into their military planning. These capabilities do not necessarily make nuclear war more likely by themselves, but they create uncertainty about survivability, response time, escalation thresholds and the credibility of limited nuclear use.²

Hypersonic glide vehicles are especially significant because they combine high speed, manoeuvrability and depressed flight profiles. Unlike traditional ballistic missiles that follow more predictable trajectories, HGVs can travel through the atmosphere after boost phase and manoeuvre toward targets. This complicates tracking, warning and interception. The strategic concern is not simply that hypersonic weapons are fast. The deeper concern is that they may compress the time available for leaders to interpret warning, consult advisers, verify information and decide whether to respond.³

Precision-guided conventional weapons create another challenge. The old distinction between conventional and nuclear war becomes blurred when conventional weapons gain the range, accuracy and destructive capacity to threaten nuclear-related targets. A conventional strike against nuclear command-and-control infrastructure, bomber bases, missile sites, early-warning radars or submarine support facilities may be interpreted as the beginning of a disarming campaign. Even if the attacking state intends only conventional coercion, the target state may fear that its nuclear deterrent is at risk.⁴

Non-strategic nuclear weapons deepen the problem by introducing the possibility of nuclear use at lower levels of conflict. These weapons are often described as tactical, battlefield or theatre nuclear systems, although the distinction between tactical and strategic effects can be misleading. A low-yield nuclear weapon used against a military target may still produce strategic consequences because it breaks the nuclear taboo, creates escalation pressure and invites retaliation. Non-strategic nuclear weapons therefore create an unstable middle space between conventional war and strategic nuclear exchange.⁵



This article argues that nuclear deterrence in the age of precision and speed faces three interrelated pressures. First, hypersonic weapons compress decision-making and increase the risk of misinterpretation. Second, conventional counter-force capabilities threaten the survivability assumptions on which deterrence depends. Third, non-strategic nuclear weapons create escalation pathways by making nuclear use appear more limited, controllable or militarily usable. Together, these trends do not eliminate deterrence, but they make deterrence more complex and potentially more unstable.

OBJECTIVES OF THE STUDY

The first objective of this article is to analyse how hypersonic glide vehicles affect strategic stability by compressing warning and decision-making timelines. The second objective is to examine how precision-guided conventional weapons may threaten nuclear second-strike capabilities through counter-force targeting. The third objective is to compare counter-force and counter-value targeting in the context of modern deterrence. The fourth objective is to assess the strategic utility and escalation risks of non-strategic nuclear weapons in regional conflicts. The fifth objective is to propose policy measures for reducing nuclear risks in an era of speed, precision and technological ambiguity.

METHODOLOGY

This article uses a qualitative, analytical and doctrinal research methodology. It draws upon classical deterrence theory, contemporary strategic studies, arms-control literature, official reports, think-tank research and scholarly work on hypersonic weapons, counter-force targeting and non-strategic nuclear weapons. The article avoids operational or technical details that could enable real-world targeting or weapons employment. Its focus is conceptual, strategic and policy-oriented.

The analysis is organized around three core concepts: strategic stability, second-strike survivability and escalation logic. Strategic stability refers to a condition in which nuclear-armed adversaries do not have strong incentives to strike first during a crisis. Second-strike survivability refers to the ability of a state to absorb an attack and still retaliate with nuclear force. Escalation logic refers to the pathways through which limited military action can generate pressures for wider or more destructive conflict.

Conceptual Framework: Deterrence, Stability and Nuclear Risk

Deterrence is the use of threats to prevent an adversary from taking an unwanted action. In nuclear strategy, deterrence normally depends on capability, credibility and communication. Capability means the state possesses the weapons and delivery systems required to impose unacceptable costs. Credibility means the adversary believes the state may actually retaliate under specified conditions. Communication means the adversary understands what actions may trigger retaliation.⁶

Strategic stability is achieved when neither side believes it can gain by striking first. If both sides possess secure second-strike forces, the logic of deterrence is relatively stable because a first strike cannot eliminate the opponent's retaliatory capacity. However, if one side believes its nuclear forces are vulnerable, it may adopt dangerous postures such as launch-on-warning, pre-delegation, dispersal under crisis pressure or early escalation. Vulnerability therefore affects not only military balance but also political psychology.

Mutually assured destruction was never a perfect doctrine, but it created a stabilizing insight: nuclear war could not be won at acceptable cost. The problem in the contemporary era is that new technologies may erode this insight indirectly. They may create the belief that a limited, precise or non-nuclear strike can disable an adversary's nuclear forces without triggering full retaliation. Even if this belief is false, it may still produce dangerous planning assumptions.

The modern deterrence problem is therefore not only nuclear versus nuclear. It is conventional-nuclear entanglement. Conventional weapons may threaten nuclear assets. Cyber operations may affect nuclear command systems. Space systems may support both conventional and nuclear missions. Dual-capable missiles may carry either conventional or nuclear payloads. In such an environment, an adversary may misread the character of an incoming attack and respond at a higher level than intended.

Hypersonic Glide Vehicles and Decision-Time Compression

Hypersonic glide vehicles are weapons that are launched by a rocket booster and then glide through the atmosphere at hypersonic speeds while manoeuvring toward a target. Their key strategic attributes are speed, manoeuvrability, lower flight altitude compared with ballistic trajectories and potential unpredictability in target approach. These characteristics complicate early warning, tracking and defensive interception.⁷

The most important deterrence implication of HGVs is decision-time compression. Nuclear crisis decision-making is already difficult because leaders must assess incomplete information under pressure. Hypersonic weapons may reduce the time available to determine whether a launch has occurred, what the weapon is, where it is heading, whether it carries a conventional or nuclear payload and whether it threatens strategic assets. A shorter decision window increases the risk of miscalculation.

The danger is not simply physical speed; it is interpretive uncertainty. A ballistic missile may be faster in some phases, but its trajectory can often be estimated earlier. A manoeuvring hypersonic glide vehicle may make target prediction harder. If leaders cannot determine whether the target is a conventional military site, a nuclear command centre or a national leadership facility, they may assume the worst. Strategic stability depends on time for interpretation, and hyper-sonics threaten that time.

Hypersonic weapons may also create "use-it-or-lose-it" anxieties. If a state believes its nuclear forces or command systems are vulnerable to rapid attack, it may feel pressure to disperse forces, increase alert levels or prepare early retaliation. Such measures



may be intended as defensive precautions, but they can appear escalatory to the adversary. Thus, hypersonic weapons may destabilize crises even if they are not used.

The problem becomes more severe when hypersonic systems are dual-capable or when their payload is ambiguous. If a state cannot tell whether an incoming hypersonic weapon carries a conventional or nuclear warhead, it may interpret the strike through the lens of worst-case nuclear planning. Payload ambiguity is therefore a central risk. The same delivery system may produce different interpretations depending on political context, target location and crisis intensity.

Table 1**Hypersonic Glide Vehicles and Their Strategic Effects**

Feature of HGVs	Strategic effect	Deterrence risk
High speed	Reduces warning and response time	Leaders may make decisions under extreme pressure
Manoeuvrability	Makes target prediction more difficult	Defender may misinterpret intended target
Depressed flight profile	Complicates detection and tracking	Early-warning systems may provide delayed or incomplete information
Dual-use potential	Can carry conventional or nuclear payloads depending on system design	Payload ambiguity may trigger worst-case assumptions
Precision targeting	May threaten high-value military assets	Could create fear of disarming counter-force attack
Missile-defence evasion	May reduce confidence in defensive systems	Encourages arms racing and crisis instability

Source: Compiled by the author from contemporary strategic literature and public-domain reports on hypersonic weapons and strategic stability.⁸

Hypersonic Weapons and the Erosion of Traditional MAD

Traditional mutually assured destruction assumes that neither side can eliminate the other's retaliatory capability. Hypersonic weapons do not automatically destroy MAD, but they may erode confidence in second-strike survivability. If a state believes that hypersonic systems could strike command nodes, mobile missile units, bomber bases, submarine ports or early-warning infrastructure quickly and precisely, it may fear that its retaliatory forces are becoming vulnerable.

This fear matters even if the actual technical capability is uncertain. Deterrence depends on perceptions. If decision-makers believe that emerging technologies may permit a disarming attack, they may change nuclear posture. They may increase alert levels, deploy more mobile systems, diversify launch platforms, harden command systems, place weapons on hair-trigger alert or invest in more survivable submarines. These responses may improve survivability but also increase crisis instability.

Hypersonic weapons also interact with missile defence. If one state believes it can use hypersonic or precision weapons to reduce an adversary's nuclear forces and then use missile defence to intercept the remaining retaliatory strike, it may be tempted by damage-limitation strategies. The adversary may respond by expanding arsenals, deploying decoys, developing more manoeuvrable systems or adopting launch-on-warning postures. The result is an arms-racing dynamic.

There is also a signalling problem. A state may deploy hypersonic weapons for conventional deterrence, believing they provide rapid non-nuclear strike options. However, an adversary may view the same systems as part of a nuclear counter-force architecture. The same weapon can therefore generate different meanings. In crisis, meaning is shaped not by technical classification alone but by fear, doctrine and strategic context.

Counter-Force and Counter-Value Targeting: Conceptual Distinction

Counter-force targeting refers to attacks against an adversary's military forces, especially nuclear forces, command-and-control systems, missile bases, bomber facilities, submarine infrastructure, radars and other strategic military assets. Counter-value targeting refers to attacks against cities, population centres, industrial infrastructure and economic assets. The distinction is central to nuclear strategy because it reflects different theories of deterrence.

Counter-value deterrence is based on punishment. It threatens unacceptable damage to society if an adversary attacks. Its stabilizing logic is that no rational leader would risk the destruction of major cities and populations. Counter-force strategy is based on limiting damage by destroying the adversary's military capability. Its destabilizing risk is that it may create incentives for first strike because the attacker seeks to disable the opponent before retaliation.

Modern precision-guided conventional weapons complicate this distinction. In the past, counter-force missions against hardened nuclear targets often required nuclear weapons because conventional weapons lacked sufficient accuracy and destructive power. Today, advanced conventional weapons may threaten some nuclear-related targets, especially soft, fixed or exposed assets. This raises the possibility of non-nuclear counter-force operations with strategic consequences.⁹

The problem is that a conventional strike against nuclear-related assets may not be interpreted as limited. If a missile destroys a radar, command bunker, submarine communication node or nuclear-capable air base, the target state may assume that a broader disarming campaign is underway. The attacker may see the strike as conventional; the defender may see it as nuclear-relevant.

Table 2

**Counter-Force vs Counter-Value Targeting**

Basis of comparison	Counter-force targeting	Counter-value targeting
Primary target	Military forces, nuclear assets, command systems, bases and launchers	Cities, population centres, industry and economic infrastructure
Strategic logic	Damage limitation and military advantage	Punishment and unacceptable retaliation
Relationship with first strike	May create incentives for pre-emption if nuclear forces appear vulnerable	Generally supports deterrence through assured retaliation
Role of precision weapons	High precision increases feasibility against military targets	Precision is less central because target areas are broader
Escalation risk	High, because attacks on nuclear assets may appear disarming	Extremely high if executed, but less likely to be viewed as limited
Stability effect	Potentially destabilizing if it threatens second-strike forces	Stabilizing in theory through mutual vulnerability, but morally catastrophic
Modern challenge	Conventional weapons may perform strategic counter-force roles	Counter-value threats remain politically and ethically unacceptable

Source: Compiled by the author from classical deterrence theory and contemporary literature on precision strike, conventional-nuclear entanglement and strategic stability. ¹⁰

Precision-Guided Conventional Weapons and Second-Strike Vulnerability

Second-strike capability is the foundation of stable nuclear deterrence. A state must be able to retaliate even after absorbing a first strike. This requires survivable delivery systems, protected command-and-control, reliable communication, dispersed forces and credible political will. Precision-guided conventional weapons threaten this foundation by creating new ways to attack nuclear-related infrastructure without crossing the nuclear threshold.

The most sensitive targets are not necessarily nuclear warheads themselves. They include command posts, communication links, radar systems, air bases, naval bases, submarine support facilities, mobile missile garrisons, transport networks and leadership nodes. If these assets are degraded, the target state may fear that its ability to retaliate is being undermined.

The risk is especially high for states with smaller or less diversified nuclear arsenals. A state with a large triad may absorb damage and retain retaliatory options. A state with a small arsenal, limited submarines, few mobile missiles or vulnerable command systems may fear that precision conventional strikes could significantly weaken its deterrent. Such fears can produce dangerous nuclear postures.

Conventional counter-force also creates ambiguity in regional conflicts. A state may strike an air base because it supports conventional operations, but the same base may host nuclear-capable aircraft. A state may strike communication infrastructure because it supports military coordination, but the defender may see it as part of nuclear command-and-control. Dual-use infrastructure makes escalation management extremely difficult.

The emergence of long-range conventional weapons with strategic effects challenges traditional arms-control categories. Arms control historically distinguished between nuclear and conventional forces, but modern systems blur that distinction by allowing conventional weapons to perform missions previously associated with nuclear counter-force. This does not mean conventional precision weapons are equivalent to nuclear weapons, but it does mean their strategic effects can be nuclear-relevant.

Non-Strategic Nuclear Weapons: Definition and Strategic Utility

Non-strategic nuclear weapons are nuclear weapons designed for battlefield, theatre or regional missions rather than intercontinental strategic attacks. They may include short-range missiles, gravity bombs, depth charges, artillery shells, torpedoes or other delivery systems depending on the state and historical period. The term is imprecise because a weapon's strategic effect depends not only on range or yield but also on target, context and political meaning. ¹¹ The strategic utility claimed for NSNWs is that they provide flexible deterrence. A state may believe that low-yield nuclear options deter conventional aggression by threatening limited nuclear escalation. For weaker conventional powers, NSNWs may compensate for conventional inferiority. For extended deterrence alliances, forward-deployed or theatre nuclear weapons may reassure allies by demonstrating commitment.

However, the same qualities that make NSNWs appear useful also make them dangerous. Their lower yields and regional roles may create the illusion that nuclear use can be controlled. Leaders may believe that a limited nuclear strike can shock the adversary into stopping without triggering full nuclear retaliation. This belief is the core of the escalation problem. Once the nuclear threshold is crossed, no state can confidently control the adversary's response.

NSNWs also create command-and-control challenges. Because they may be intended for battlefield or theatre use, there may be pressure to deploy them closer to conflict zones, disperse them, pre-delegate authority or maintain higher readiness. Each of these measures can increase risks of unauthorized use, accidental escalation, theft, miscalculation or crisis instability.

The Russia-Ukraine war has renewed global concern about NSNWs. Russia has frequently used nuclear signalling, and its movement of tactical nuclear weapons to Belarus has increased anxiety in Europe. Even if actual use remains unlikely, nuclear signalling can shape adversary behaviour, alliance debates and escalation perceptions. ¹²



Table 3

Strategic Utility and Escalation Risks of Non-Strategic Nuclear Weapons

Claimed strategic utility	Associated escalation risk
Deters large-scale conventional attack	May lower the perceived nuclear threshold
Provides flexible response options	Creates illusion of controllable nuclear war
Reassures allies under extended deterrence	May make allies targets in nuclear crisis
Compensates for conventional inferiority	Encourages early nuclear signalling in battlefield defeat
Strengthens regional deterrence	Increases risk of local crisis becoming nuclear confrontation
Creates bargaining leverage	May provoke adversary counter-deployment or pre-emption fears
Demonstrates resolve	Can make de-escalation politically harder after nuclear threats

Source: Compiled by the author from nuclear deterrence literature, NTI explanations of tactical nuclear weapons and contemporary assessments of low-yield nuclear escalation risks.¹³

Regional Conflicts and the Tactical Nuclear Temptation

Regional conflicts create special risks for NSNWs because local military defeat may be interpreted as regime-threatening or strategically unacceptable. A state facing conventional inferiority may view low-yield nuclear weapons as a way to stop an adversary's advance, demonstrate resolve or force external intervention. This is sometimes described as an "escalate to de-escalate" logic, although the phrase is debated and may oversimplify actual doctrine. The problem is that nuclear use cannot be guaranteed to remain limited. A low-yield nuclear strike against a battlefield target may still produce mass casualties, radioactive contamination, political shock and global condemnation. The adversary may respond with nuclear weapons, massive conventional strikes or attacks on leadership and command systems. Allies may be drawn in. Neutral states may intervene diplomatically or economically. The conflict may expand beyond the original theatre.

South Asia is often discussed in this context because Pakistan has developed short-range nuclear options to deter India's conventional military superiority. The danger is that such weapons may lower the nuclear threshold in a crisis involving terrorism, border conflict or limited conventional operations. India, by contrast, has traditionally emphasized massive retaliation, though debates continue about credibility and proportionality. The result is a dangerous interaction between limited-war concepts and nuclear escalation. Europe presents another risk. Russia's large stockpile of non-strategic nuclear weapons and its nuclear signalling during the Ukraine war have raised concerns about whether Moscow might consider limited nuclear use under extreme battlefield conditions. NATO's challenge is to deter such use without creating incentives for Russian pre-emption or uncontrolled escalation.

East Asia also contains NSNW-related concerns. North Korea's development of shorter-range nuclear-capable systems and increasingly explicit nuclear doctrine raises the possibility that Pyongyang may integrate nuclear options into regional war planning. This creates risks for South Korea, Japan and U.S. forces in the region.

Hyper-sonics, Counter-Force and NSNWs as a Connected Risk System

Hypersonic weapons, precision counter-force capabilities and NSNWs are often analysed separately, but they form a connected risk system. Hyper-sonics compress decision time. Precision counter-force threatens survivability. NSNWs create lower-threshold nuclear options. Together, they weaken the stability provided by clear thresholds, survivable retaliation and slow-moving crisis diplomacy. In a crisis, these systems may interact dangerously. For example, a state may launch a conventional hypersonic strike against what it considers a military target. The defender may believe the strike is aimed at nuclear command-and-control. Fearing follow-on attacks, the defender may raise nuclear alert levels or signal possible NSNW use. The attacker may interpret that signal as preparation for nuclear escalation and strike additional targets. Escalation may occur even if neither side initially intended nuclear war.

The central problem is ambiguity. Modern weapons often blur distinctions between conventional and nuclear, tactical and strategic, offensive and defensive, regional and global. Deterrence theory depends on signalling, but ambiguity makes signals harder to read. A weapon intended for conventional deterrence may be perceived as a nuclear first-strike tool. A low-yield nuclear weapon intended for deterrence may be perceived as making nuclear use more likely.

Table 4

Integrated Risk Matrix: Precision, Speed and Nuclear Escalation

Technology or doctrine	Primary stabilizing claim	Primary destabilizing risk
Hypersonic glide vehicles	Rapid strike and deterrence by denial	Decision-time compression and target ambiguity
Precision-guided conventional weapons	Non-nuclear military effectiveness	Threat to nuclear second-strike infrastructure
Missile defence	Protection against attack	Fear of damage-limitation strategy
Cyber operations	Disruption without kinetic force	Threat to nuclear command-and-control
Non-strategic nuclear weapons	Flexible deterrence and regional reassurance	Lower nuclear threshold and escalation uncertainty
AI-enabled surveillance	Better warning and tracking	Automation bias and rapid escalation pressure

Source: Compiled by the author from strategic stability literature and contemporary policy reports on emerging technologies and nuclear risk.¹⁴



Implications for Nuclear Command-and-Control

Nuclear command-and-control systems are central to deterrence because they allow political leaders to authorize, withhold or communicate nuclear use. These systems must be survivable, secure, reliable and under political control. Hypersonic weapons, cyber operations and precision conventional strike create new pressures on command-and-control because they may threaten the nodes that connect leaders with nuclear forces.

If leaders fear that command systems may be destroyed quickly, they may adopt riskier postures. These could include higher alert levels, greater delegation, launch-on-warning arrangements or dispersal of nuclear forces during crisis. Such measures may improve survivability but reduce safety. The central dilemma is that steps taken to ensure retaliation may increase the probability of accidental or premature escalation.

Cyber threats intensify the dilemma. A cyber operation against communication networks may be intended to disrupt conventional operations, but it may be interpreted as preparation for nuclear attack if the networks are dual-use. Similarly, attacks on satellites may degrade both conventional and nuclear warning systems. The entanglement of nuclear and non-nuclear command infrastructure makes escalation control more difficult.

AI may also affect command-and-control indirectly. AI-enabled early warning, sensor fusion and decision support could improve situational awareness, but it may also accelerate decision-making in dangerous ways. Leaders may be pressured to rely on algorithmic assessments during compressed crises. If data are incomplete or manipulated, automated recommendations could worsen misperception.

Arms Control and Risk Reduction Challenges

Existing arms-control frameworks were not designed for the full complexity of hypersonic weapons, conventional counter-force and NSNWs. Many hypersonic systems are conventional, but their strategic effects may be nuclear-relevant. Many NSNWs are not covered by major strategic arms treaties. Conventional precision weapons are generally outside nuclear arms-control arrangements, even when they may threaten nuclear assets. This creates governance gaps. Risk reduction does not require immediate comprehensive disarmament. It can begin with transparency, notification, dialogue and restraint measures. States could discuss hypersonic test notifications, payload transparency, basing restraint, crisis communication and non-targeting understandings for nuclear command-and-control. Such measures would not eliminate competition, but they could reduce misinterpretation.

NSNWs require particular attention. Their numbers, locations and doctrines are often less transparent than strategic nuclear weapons. Future arms-control efforts should include non-strategic nuclear systems, but this will be politically difficult because states link them to regional balances and alliance commitments. Verification would also be challenging because NSNWs can be smaller, mobile and dual-capable. Conventional counter-force risks may be addressed through norms against attacks on nuclear command-and-control, early-warning systems and strategic communication nodes. Such norms would be difficult to verify but useful for crisis stability. Even declaratory restraint can matter if it shapes expectations and reduces worst-case assumptions.

Policy Recommendations

- I. Nuclear-armed states should preserve decision time as a strategic stability objective. This means avoiding postures, deployments and doctrines that force leaders into rapid launch decisions. Decision time should be treated as a security asset.
- II. States should develop crisis communication mechanisms specifically addressing hypersonic and dual-capable missile ambiguity. Hotlines, launch notifications, test transparency and emergency clarification channels can reduce misinterpretation.
- III. Nuclear powers should avoid targeting or threatening nuclear command-and-control systems with conventional weapons. Even if such targets are militarily attractive, attacks on them may be interpreted as preparation for nuclear disarming strikes.
- IV. Arms-control discussions should include hypersonic weapons, non-strategic nuclear weapons and conventional-nuclear entanglement. Traditional strategic arms-control categories are no longer sufficient.
- V. States should increase the survivability of nuclear forces without adopting destabilizing launch-on-warning postures. Survivability should be achieved through redundancy, secure communication and dispersal rather than pressure for immediate launch.
- VI. NSNWs should be subject to greater transparency and future arms-control efforts. Their perceived tactical utility is outweighed by their escalation risks.
- VII. Regional nuclear rivals should pursue risk-reduction agreements, including missile test notifications, non-attack pledges against nuclear facilities, crisis hotlines and military-to-military communication.
- VIII. Policymakers should resist the illusion of limited nuclear control. Any nuclear use, even low-yield or regional, would transform the political character of conflict and create unpredictable escalation pathways.

FINDINGS

The first finding of this article is that hypersonic glide vehicles do not automatically invalidate nuclear deterrence, but they weaken strategic stability by compressing warning and decision-making timelines. The second finding is that precision-guided conventional weapons create counter-force anxieties because they may threaten nuclear-related assets without using nuclear warheads. The third finding is that the distinction between counter-force and counter-value targeting remains conceptually



important, but modern technology blurs the operational boundary between conventional and nuclear effects. The fourth finding is that non-strategic nuclear weapons create escalation risks because they encourage the belief that nuclear use can be limited or controlled. The fifth finding is that the greatest risk comes from the interaction of speed, precision and ambiguity rather than from any single technology. The sixth finding is that modern deterrence requires not only nuclear arsenals but also survivable command systems, credible communication, restraint norms and crisis-management mechanisms.

CONCLUSION

Nuclear deterrence in the age of precision and speed is more complex and fragile than classical deterrence theory suggests. Hypersonic glide vehicles, precision-guided conventional weapons and non-strategic nuclear weapons do not eliminate deterrence, but they change the conditions under which deterrence operates. The central issue is not merely destructive power; it is decision time, survivability and interpretation.

Hypersonic weapons compress decision-making windows and create uncertainty about target and payload. Precision conventional weapons threaten nuclear-related infrastructure and may generate fears of counter-force attack. Non-strategic nuclear weapons create the illusion that nuclear use can be limited, tactical or controlled. Together, these developments strain the traditional logic of mutually assured destruction by weakening confidence in second-strike survivability and increasing the risk of rapid escalation.

The problem is not only technological. It is political and psychological. Deterrence depends on what leaders believe during crisis. If they believe their nuclear forces are vulnerable, they may act quickly and dangerously. If they believe the adversary is preparing a disarming strike, they may escalate before losing options. If they believe low-yield nuclear use can restore deterrence, they may cross a threshold that cannot be controlled.

The future of nuclear stability will therefore depend on preserving time, clarity and survivability. Arms control must adapt to hypersonic weapons, dual-capable systems, NSNWs and conventional-nuclear entanglement. Crisis communication must become faster and more reliable. Nuclear command systems must remain secure without creating launch-on-warning pressures. Political leaders must recognize that precision and speed can create not only military advantage but also strategic instability.

The age of precision and speed does not make nuclear war inevitable. However, it makes complacency dangerous. The central task of modern deterrence is to prevent technologies designed for rapid advantage from producing irreversible catastrophe.

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