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The Evolution of China's Nuclear Forces

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Introduction

In recent years, China has embarked on the most significant transformation of its nuclear forces in its history. U.S. Department of Defense (DoD) projections indicate the People's Republic of China (PRC) could field over 1,000 nuclear warheads by 2030.[1] The scope and speed of this buildup have raised fundamental questions about China's evolving nuclear strategy, its long-term intentions, and the future of strategic stability in the Indo-Pacific and beyond. While Beijing continues to affirm its longstanding No First Use (NFU) policy and officially characterizes its arsenal as a retaliatory force, the trajectory of China's modernization tells a more complex story, one that its traditional conceptions of minimum deterrence cannot fully explain. To understand the significance of China's nuclear modernization, it is essential to examine the historical and doctrinal roots of its nuclear posture and assess how technological advancements, shifting threat perceptions, and political ambition have converged to drive recent changes. From Mao Zedong's ideological dismissal of nuclear coercion to the creation of a survivable, if limited, second-strike force during the Cold War, China's approach to nuclear deterrence has long been defined by strategic restraint. But today, as its arsenal grows in size, sophistication, and responsiveness, the balance between restraint and ambition appears to be shifting.

This paper argues that China's nuclear modernization is not simply a reactive effort to preserve deterrence in the face of improved U.S. capabilities, nor is it merely a symbolic expression of ambitions for great power status. Rather, it represents a strategic recalibration shaped by both defensive concerns and political motivations, one that preserves continuity with China's past but introduces the potential for changes in its nuclear strategy. While there is strong evidence that China's NFU policy remains a genuine, self-imposed constraint, the expansion of nuclear capabilities, particularly launch-on-warning systems, lower-yield warheads, and dual-capable platforms, creates new space for ambiguity in interpreting their nuclear intentions. A divergence between policy and posture raises the risk that China's deterrence strategy may evolve in practice even without formal doctrinal changes.

The implications of this shift are profound. China's nuclear weapons have historically served as a backstop for sovereignty and regime survival; they now increasingly support a more assertive regional posture and may contribute to counter-intervention strategies designed to deter U.S. involvement in a Taiwan contingency or broader Indo-Pacific conflict. As Beijing's arsenal becomes more flexible and survivable, it complicates traditional assumptions about crisis stability, extended deterrence, and arms control. For the United States, the challenge is not only to deter nuclear use, but also to manage the strategic ambiguity China increasingly exploits across conventional, nuclear, space, and cyber domains. To that end, U.S. policy must rely on interlocking principles of credibility, clarity, restraint, and communication.

This paper proceeds in four sections. The first traces the evolution of China's nuclear capability and doctrine, with particular attention on the political and strategic logic of its early restraint. The second analyzes the scope and nature of current modernization efforts, including delivery systems, warhead development, and new technologies such as fractional orbital bombardment and hypersonic glide vehicles. The third explores the military-technical and political drivers behind this transformation, while the fourth assesses the implications for strategic stability, extended deterrence, and U.S. military and diplomatic strategy. The goal of this paper is not to offer a singular solution, but to provide a comprehensive and nuanced

foundation for developing U.S. policy. By understanding how and why China's nuclear trajectory has evolved, it becomes possible to craft a more resilient, realistic, and informed approach to deterrence in an increasingly multipolar and uncertain strategic environment.

Background

China entered the nuclear era with a largely defensive mindset shaped by Maoist ideology, economic hardships, and a deep skepticism of nuclear coercion. Chinese leaders initially resisted nuclear armament on both ideological and practical grounds, viewing atomic weapons as tools of imperialist intimidation that held limited utility against its predominantly rural and resilient population. However, this posture shifted as China confronted mounting security threats, particularly from the United States, and recognized the political and technological value of possessing a nuclear deterrent. With early assistance from the Soviet Union and a growing fear of strategic vulnerability during the Korean War and Taiwan Strait Crises, China embarked on a nuclear program designed not for battlefield advantage, but for political bargaining and long-term national security. The legacy of these formative decisions, emphasizing strategic restraint, second-strike survivability, and asymmetric stability, continues to shape Beijing's nuclear posture today, even as its capabilities and global ambitions evolve. Situating current developments within this historical framework is crucial for understanding China's strategic intentions and for developing effective U.S. policy responses.

Early Resistance to Nuclear Weapons

The nuclear era began on July 16, 1945, when the United States conducted the first successful test of an atomic weapon. Although the Soviet Union, United Kingdom, and France developed their nuclear programs in subsequent years, China remained nearly two decades behind. In the early years of the PRC, Mao Zedong's strategic vision emphasized national ideological resilience and mass personnel mobilization over advanced military technology.[2] The doctrine of "People's War" held that a committed, rural population could outlast and eventually overcome more technologically advanced adversaries through protracted, decentralized warfare.[3] Within this framework, nuclear weapons were seen not as decisive military instruments but as tools of imperialist coercion.[4] Mao famously dismissed nuclear weapons as "paper tigers," arguing that they appeared fearsome but were ultimately ineffective against a country as vast, dispersed, and grounded in revolutionary will as China.[5] This rejection of nuclear weapons was not merely rhetorical. It served an important political function, reinforcing national morale and aligning public sentiment with Maoist themes of anti-imperialism, self-reliance, and political primacy over technological sophistication.[6] By downplaying the military utility of nuclear weapons, Mao strengthened the legitimacy of his national defense doctrine in the face of overwhelming U.S. and Soviet superiority.

Economic realities further necessitated this stance. The aftermath of the Chinese Civil War and the failures of the Great Leap Forward left China impoverished, technologically deficient, and ill-equipped to develop sophisticated weapons programs.[7] Without the industrial base or scientific infrastructure required for a nuclear program, strategic doctrine had to compensate for material limitations. In this context, the People's War doctrine was not just ideologically

convenient, it was strategically necessary. It offered a credible means of national defense that did not depend on capabilities the PRC could not yet produce. Mao's dismissal of nuclear weapons thus reflected both revolutionary conviction and a pragmatic necessity. Acknowledging vulnerability to nuclear attack might have undermined public confidence during a period of famine, internal unrest, and post-colonial humiliation.[8] By framing nuclear weapons as ineffective against China's unique geography and societal structure, Mao forestalled domestic pressure for capabilities the country could not develop and preserved the illusion of strategic parity through ideological means. However, this early resistance to nuclear weapons would not last indefinitely. As China's geopolitical environment changed and its industrial capacity improved, so too would its approach to nuclear strategy.

The Shift to Acquire Nuclear Weapons

While Mao Zedong's early rejection of nuclear weapons stemmed from both ideology and resource limitations, by the mid-1950s Chinese leaders had begun reassessing whether revolutionary determination alone could ensure national security. China's shift toward nuclear acquisition was catalyzed by mounting external threats, especially from the United States, and a growing sense of strategic vulnerability. The Korean War (1950–1953) and the First Taiwan Strait Crisis (1954–1955) deeply shaped Chinese perceptions of nuclear coercion.[9] During this time, U.S. nuclear superiority played an important role in American diplomatic relationships and served as a tool for political leverage.[10] Presidents Truman and Eisenhower, both military men, viewed atomic weapons as usable instruments of national power.[11] After his election in 1952, Eisenhower sought to reach an armistice in the Korean War, threatening to escalate the war if negotiations remained in a stalemate. His threats included a promise to "move decisively without inhibition in our use of weapons." This involved moving atomic weapons into Okinawa and Secretary of State John Foster Dulles reportedly informing Indian Prime Minister Nehru of the U.S. willingness to use atomic weapons if a truce could not be arranged.[12] American and Chinese historical accounts differ on how these threats were interpreted and how they influenced armistice negotiations. Dulles and Eisenhower credited nuclear threats with helping to secure an armistice in Korea. However, there is a lack of direct proof that this was a decisive factor for Beijing.[13] While the precise effect of these threats remains debated, Chinese leaders clearly interpreted U.S. behavior as a willingness to use nuclear force to achieve political objectives.[14] For Mao and his senior leadership, these episodes underscored a stark reality; without a credible nuclear deterrent, China would remain strategically subordinate and vulnerable to Western coercion.[15]

The PRC's security dilemma was further compounded by geopolitical isolation, confronting a hostile United States to the east and an increasingly unreliable Soviet Union to the north. Lacking the protection of secure alliances or extended deterrence guarantees, in 1955 Mao concluded that national survival required an independent nuclear capability. He famously declared, "the danger of a world war and the threats to China come mainly from the warmongers in the United States," and unless China possessed atomic weapons, it would continue to be "intimidated" on the world stage.[16] The objective was not to match adversaries in scale or to initiate a nuclear war, but to acquire a sufficient deterrent to prevent one.

While strategic necessity drove the shift in outlook, Soviet assistance made it possible. In 1957, Beijing and Moscow signed the Agreement on New Technology for National Defense, under which the Soviet Union provided China with key technical blueprints, uranium enrichment equipment, and scientific expertise.[17] Although the partnership was short-lived, dissolving in 1962 amid growing Sino-Soviet tensions, this period of collaboration laid the technical foundation for China's independent nuclear program. Soviet assistance accelerated the development of fissile material production infrastructure, bomb designs, and experimental facilities, giving China a head start that would have otherwise taken much longer to achieve.[18] With Soviet assistance to accelerate development, on October 16, 1964 China successfully detonated its first atomic device at the Lop Nur test site. This was more than a scientific milestone; it was a geopolitical declaration. With the successful test, China announced that it would no longer tolerate strategic subordination to nuclear armed powers or live under the shadow of perceived nuclear blackmail.

China's nuclear ambitions were shaped not only by external threats, but also by internal aspirations. For Mao and the Chinese Communist Party (CCP), the atomic bomb symbolized scientific advancement, industrial strength, and ideological vindication.[19] That is, the bomb was both a shield and a trophy, a means of deterring aggression and a demonstration that the socialist model could match or exceed the technological achievements of capitalist or imperialist states. This quest for nuclear status echoed other goals of the Great Leap Forward, such as surpassing the United Kingdom in steel production or launching satellites to demonstrate technological parity.[20] Importantly, China's nuclear breakthrough also marked a change in global status. Joining the nuclear "club "elevated China from the ranks of the vulnerable to the circle of great powers. Deng Xiaoping would later articulate this strategic logic in 1988, stating that without atomic bombs, hydrogen bombs, and satellite launches, "China would not have had the international status it has now."[21] This enduring belief that nuclear weapons represent geopolitical legitimacy continues to shape Chinese leadership rhetoric and strategic identity today.

Nuclear Weapon Development

After Mao formally authorized a nuclear program in 1955, the CCP began articulating a more structured vision for its nuclear ambitions. In 1958, the Central Military Commission (CMC) issued the Guidelines for Developing Nuclear Weapons, which outlined the purpose, priorities, and strategic objectives of China's nascent nuclear program. The CMC guidelines framed nuclear weapons as tools of national defense, designed primarily to "warn our enemies against making war on us," not to be used for battlefield dominance or coercion. They explicitly prioritized high-yield thermonuclear warheads and long-range delivery systems, while rejecting the development of tactical nuclear weapons.[22] This design choice reflected a strategic intent that emphasized a credible retaliatory capability over flexible nuclear options. Nuclear weapons were also designated a national priority, taking precedence over all other reconstruction efforts, as part of the broader campaign to "catch up" with more advanced industrial powers.[23] Yet, this ambition did not translate into a quest for numerical parity with larger nuclear powers. In contrast to the United States or Soviet Union, who pursued layered deterrence strategies and large, diverse nuclear arsenals, China focused on a small but effective counterstrike force.

China's early force was designed for minimal deterrence. Rather than planning for limited nuclear exchanges on a battlefield or mutually assured destruction, the PRC relied on a small number of high-yield warheads capable of inflicting unacceptable damage on enemy population centers.[24] This approach aligned with China's limited resources and strategic posture. It avoided the operational demands of precision or flexibility while enabling a credible second-strike threat. In the 1960s and early 1970s, China's small nuclear force consisted almost entirely of liquid-fueled ballistic missiles which required hours or even days to prepare for launch.[25] Despite possessing only a limited arsenal, this was adequate to satisfy China's concept of minimum deterrence through the ability to retaliate after absorbing a first strike.[26] At the same time, China prioritized technological mastery in their limited arsenal. Rather than incrementally building nuclear technology, Beijing pursued thermonuclear weapons and intercontinental ballistic missiles (ICBMs) almost immediately. As Jeffrey Lewis argued, this ambition reflected the ideological temperament of the Great Leap Forward, where political will and scientific achievement were tightly fused.[27]

Despite the PRC's ambitious goals for its nuclear weapons, Mao continued to downplay the military relevance of its arsenal. In a 1968, Mao remarked, "With this little nuclear weaponry, we cannot be counted as a nuclear country" and official PRC statements stressed that "China has a few nuclear weapons, but she will never join the so-called club of nuclear powers."[28] This statement reflected a broader sentiment where the CCP remained publicly opposed to nuclear weapons and often framed its pursuit of nuclear capability as a reluctant response to international pressure. Even after its first nuclear test, CCP statements professed "the Chinese Government has consistently advocated the complete prohibition and thorough destruction of nuclear weapons. If this had been achieved, China need not have developed nuclear weapons. But our proposal has met with stubborn resistance from the U.S. imperialists."[29] This seemingly antithetical framework of ambition and opposition laid the foundation for a unique approach to nuclear weapons that distinguished China from other nuclear powers.

Doctrine

From the moment China became a nuclear power, it adopted a doctrinal stance fundamentally different from those of the United States or Soviet Union. Rather than pursuing nuclear warfighting capabilities or an escalation dominance framework, China grounded its strategy in three mutually reinforcing principles: a retaliation-only posture anchored in a formal NFU policy; deliberate ambiguity regarding the conditions and conduct of nuclear use; and a long-term belief in the ability to maintain strategic stability with minimal nuclear capabilities.
The PRC's NFU declaratory policy is a pledge that "China will never at any time and under any circumstances be the first to use nuclear weapons" and is accompanied by assurances to not threaten or use nuclear weapons against non-nuclear weapon states or within nuclear weapon-free zones.[30] CCP public statements from the 1960s until today have unequivocally reiterated this commitment. Historically, NFU has served multiple strategic purposes. It aligned with China's broader military posture and allowed the PRC to rely on a small counterstrike force. As long as China could guarantee second-strike capability, it avoided the costly infrastructure required for a larger and more sophisticated nuclear arsenal. Additionally, NFU differentiated China from other nuclear powers and reinforced its image as a restrained and responsible nuclear actor. This

enabled PRC efforts to shape favorable global perceptions, enhance soft power, and critique U.S. nuclear policy from a credible standpoint.

Outside of its explicit commitment to NFU, China's overall approach to nuclear strategy is deliberately ambiguous. Public statements reiterate the "defensive purpose" of China's nuclear weapons while failing to articulate a clear nuclear doctrine.[31] This includes a refusal to specify the conditions under which NFU applies.[32] Additionally, deliberate ambiguity is reflected in a lack of transparency regarding the size of its arsenal and development of its nuclear program.[33] For example, Chinese officials denied the construction of new silo fields and even dismissed claims that it was expanding its nuclear arsenal, claiming that modernization efforts are simply measures to improve safety and reliability.[34] This lack of transparency is an important feature in China's approach to nuclear deterrence in an environment of asymmetric stability, especially with the U.S. By withholding details about thresholds, response options, or escalation ladders, China complicates adversary planning and reduces the likelihood of preemptive action. As one PLA author observed, "in asymmetrical deterrence, the stronger side often reveals its nuclear forces, while the weaker side conceals them to increase the other side's uncertainty and fear."[35] For a state with a smaller arsenal, ambiguity serves as a force multiplier, generating deterrent effect through uncertainty rather than volume.

Underpinning China's doctrinal logic is a distinctive understanding of strategic stability. Chinese and Western literature have similar definitions of strategic stability as a condition in which no rational actor sees advantage in initiating military conflict.[36] However, China's approach to strategic stability has long diverged from that of other major nuclear powers. Unlike the Cold War model of symmetric deterrence, which relied on arsenal equivalence and principles of mutually assured destruction, China's framework was built on asymmetric deterrence through mutual vulnerability. In this view, deterrence does not require parity, but rather the ability to hold a potential adversary at risk. This concept of mutual vulnerability requires both sides to believe that any nuclear aggression would provoke unacceptable retaliation. Therefore, stability can be preserved even if the balance of forces is unequal. This belief has guided Chinese nuclear policy for decades. Until 2009, China was only the 5th largest nuclear power with a limited regional capacity and few dozen ICBMs capable of striking the United States.[37] Yet, it remained confident that these forces, paired with a NFU policy and deliberate ambiguity, were sufficient to deter adversaries. Moreover, with a vast interior, rugged terrain, and a historically dispersed population, Chinese leaders believed the country could absorb a first strike and retain the capacity to respond. This logic, rooted in Maoist-era thinking, provided psychological and political justification for restraint.

However, some analysts are skeptical about the real deterrent value of China's early nuclear forces. In fact, RAND assessments note that China's retaliatory capability only became operationally credible in the early 2000s, following modest modernization efforts.[38] During this time new capabilities, such as more mobile and survivable launch platforms, began to close the gap between China's doctrinal commitments and its technical capacity. This convergence between China's doctrine and its actual capabilities made its second-strike potential more credible. Still, China's approach to nuclear deterrence carried inherent weaknesses and depended on the ability to retaliate after a nuclear strike despite possessing a limited arsenal. Technological advances such as missile defenses, precision strike capabilities, hypersonic weapons, and space-

based surveillance have made it increasingly difficult for China to assume its deterrent will remain credible without adaptation.[39] Thus, if mutual vulnerability cannot be preserved, PRC analysts assert that ambiguity, concealment, and modernization are necessary countermeasures to preserve deterrence.[40]

Enduring Restraint, Emerging Tensions

China's historical experience with nuclear weapons reveals a posture shaped by strategic caution, technological ambition, and geopolitical necessity. From the outset, Chinese leaders viewed nuclear weapons not as tools for battlefield use, but as political instruments to deter coercion, assert sovereignty, and project national strength. From Mao's insistence that nuclear capability was necessary to resist U.S. intimidation, to Deng Xiaoping's asserted that atomic bombs elevated China's international status. Nuclear weapons became both a shield and a symbol of national revival. For decades, China's deterrent was built on this dual foundation, operational restraint and political symbolism. While this posture is suitable for a defensively oriented, technologically limited state, it becomes more difficult to sustain as national power grows and strategic interests expand. This raises an uncomfortable question: Can a model built on minimalism and restraint endure if the global strategic environment becomes more contested? As China's power grows and its ambitions extend beyond territorial defense, the limits of asymmetric deterrence may become harder to sustain. The next section explores how these pressures have driven a fundamental transformation in China's nuclear modernization, one that challenges the traditional boundaries of its doctrinal logic.

Nuclear Modernization

For decades, China's nuclear strategy rested on a foundation of minimalism, ambiguity, and asymmetric stability. But the strategic environment that sustained that posture is eroding. Over the past decade, the PRC has undertaken the most significant expansion of its nuclear forces in history, one that challenges long-standing assumptions about the size, structure, and intended use of its arsenal. In 2020, the DoD estimated that the PRC possessed approximately 200 nuclear warheads and expected that number to double by 2030.[41] This has proven to be an under-estimation of China's nuclear expansion. As of 2024, China's operational nuclear stockpile has already surpassed 600 warheads and new DoD projections estimate this number will continue to grow to over 1,000 by 2030.[42] Despite this unprecedented buildup, Beijing has neither articulated a strategic rationale nor declared an end state for its expansion. Instead, it has preserved its longstanding commitment to limited transparency, resisted arms control engagements, and offered no public explanation for its nuclear trajectory.[43] This lack of clarity is not new, but in the context of a dramatically larger and more capable arsenal, it raises sharper questions about China's intentions, intentions that the Defense Intelligence Agency (DIA) assess include at least qualitative parity with the U.S. and Russian nuclear forces.[44]

Nuclear Warheads

The clearest indicator that China intends to continue expanding its nuclear stockpile is the construction of new fissile material production infrastructure. Nuclear warheads require key

components such as plutonium, highly enriched uranium, and tritium. While China's existing inventory of fissile materials has supported the current phase of expansion, the International Panel on Fissile Materials assesses that new production will be necessary to sustain growth in the future.[45] Beijing has not reported its plutonium stockpile to the International Atomic Energy Agency since 2017 and has rejected proposals for a moratorium on fissile material production despite its stated support for a Fissile Material Cutoff Treaty.[46] Two recently constructed CFR-600 fast breeder reactors, developed with Russian assistance, stand out as pivotal enablers of future warhead production with each reactor able to generate enough plutonium for dozens of warheads annually. Although the PRC characterizes these projects as part of its civilian carbon neutrality strategy, official documents identify them as "national defense investment projects," and they are governed under military nuclear regulations.[47] This strongly suggests that, despite public claims of peaceful intent, these facilities can serve a weapons-oriented role. In parallel, China is expanding uranium enrichment and tritium production, upgrading warhead manufacturing infrastructure, and may be preparing to conduct year-round operations at its Lop Nur nuclear test site. This raises serious questions in Washington about China's adherence to the U.S.-backed "zero-yield" testing standard.[48]

Another important shift embedded in this expansion is the reported development of lower-yield nuclear warheads. Historically, China's arsenal consisted almost exclusively of high-yield, strategic systems, designed to deter massive attacks, not conduct limited nuclear operations. But according to a 2017 Chinese defense industry publication, a lower-yield warhead has been developed for use against tactical or campaign-level targets, with the stated objective of minimizing collateral damage.[49] While weapon yield data remains undisclosed, the implications are clear: such warheads would provide the PRC with more tailored nuclear options, expanding the range of scenarios in which nuclear weapons might be credibly employed. Taken together, these developments point to a sustained effort to develop a much larger and more technically advanced nuclear force and marks a meaningful departure from China's traditional nuclear posture.

Delivery Systems

The growing number of warheads is complemented by improvements to China's nuclear delivery systems. In 2018, the PRC established a nuclear triad for the first time in its history, comprised of ground, air, and sea-based platforms.[50] This entire triad was just on full display during the September 3rd, 2025 PLA parade in Beijing.[51] In addition to quantitative and qualitative improvements to traditional delivery systems, the PRC is also developing next-generation nuclear capabilities such as a Fractional Orbital Bombardment (FOB) system with a hypersonic glide vehicle (HGV) payload.[52] Components of this triad are as follows:

Land: Historically, the PLA relied primarily on land-based nuclear delivery systems, a trend that persists today with the PLA Rocket Force (PLARF) comprising the largest and most mature component of China's nuclear triad. As of 2024, an estimated 30 of PLARF's 45 missile brigades are believed to operate nuclear-capable systems.[53] Prior to its elevation to a full military service

in 2015, the Second Artillery Force managed a modest arsenal of silo-based and road-mobile ballistic missiles. These legacy systems were defined by limited capability, the physical separation of warheads and launchers, and generally low levels of operational readiness. In 2010, the PRC possessed less than 100 combined intercontinental ballistic missiles (ICBM) and intermediate-range ballistic missiles (IRBM).[54] Today, that number has increased to almost 1,000, with approximately 700 assessed as nuclear-capable.[55] In 2010, the PLA had 30 nuclear-capable ICBMs which could range the continental U.S.[56] Today they have approximately 400.[57] Not all launchers are likely armed or maintained in an active nuclear configuration, but this expansion represents a significant shift in the PLARF's operational capacity.[58]

For decades, the PLARF has operated a small number of silo-based ICBMs. Prior to 2017, the PLA's entire silo-based ICBM force consisted of 18 silos housing the liquid-fueled DF-5 Class ICBM.[59] Since 2017, the number of DF-5 silos has increased from 18 to around 50 across five small missile fields in central and southern China.[60] Some of these silos are being upgraded with newer modifications of the DF-5 which include a "multi-megaton" and a multiple, independently-targetable reentry vehicles (MIRV) variant.[61] More consequential, however, is the recent construction of solid-fuel missile silos in northern China. This project includes three large-scale missile fields which are estimated to include 320 total silos.[62] In the near term, these missile fields will likely house DF-31 ICBM which carries a single warhead.[63] However, the DoD assesses that a silo-based variant of the DF-41, China's longest range and most advanced road-mobile ICBM, may be deployed in the future.[64] The DF-41 is capable of carrying up to three MIRVed warheads, meaning that the warhead count of China's new missile fields could vary significantly depending on how many of each system is deployed.[65] These fields are located deep within China's interior and are geographically dispersed, making them difficult to target with either conventional or nuclear cruise missiles. They may also be protected by dedicated air defense systems, further enhancing survivability against a preemptive disarming strike.[66]

The PLARF's increasingly robust silo-based capability is complemented by a sophisticated mobile component. Road-mobile launchers provide flexibility and increase force survivability by complicating adversary surveillance and targeting. The PLARF's road-mobile ICBM force currently consists of DF-31 and DF-41 ICBMs. Its road mobile IRBM component is comprised of DF-26 brigades.[67] At the regional level, the DF-26 IRBM is particularly significant. This system is designed for both nuclear and conventional missions in the Indo-pacific region and can conduct conventional anti-ship operations.[68] The system's ability to launch either nuclear or conventional missiles from the same launcher has raised concerns among Western analysts about the potential for ambiguity where China's nuclear and conventional forces are indistinguishable. However, despite the DF-26's dual-use design, it is unlikely that the PLARF would co-deploy nuclear and conventional missiles on the same launcher. The CCP has consistently exercised strict centralized control over nuclear weapons with an abbreviated chain of command compared to conventional systems.[69] This doctrinal separation suggests that in practice, nuclear and conventional versions of the DF-26 are likely deployed separately to preserve clear lines of authority and avoid accidental escalation. Regardless, the system's dual-use nature raises serious

concerns about nuclear-conventional commingling. In a crisis or conflict, ambiguity surrounding the payload of a DF-26 launch could heighten the risk of misinterpretation or inadvertent escalation. The DF-26 is also China's first precision strike nuclear-capable missile and the DoD has assessed it as the most likely platform to be fielded with a lower-yield nuclear warhead in the near term.[70] This offers the PRC with a more flexible and potentially usable nuclear option in regional conflicts.

These systems clearly demonstrate that the PLARF is not only larger, but more agile and survivable than it has ever been. However, materiel changes are not the only significant change to the PLARF's capability. The 2020 edition of the PRC's *Science of Military* departed from earlier doctrine by emphasizing the need for the PLA to "vigorously improve the rapid response capability of the strategic missile force" as a prerequisite for "winning strategic initiative."[71] Today, that directive is reflected in operational procedures that enable the PLARF to maintain part of its nuclear forces at a heighted states of readiness. The DoD assesses that while some PLARF units still operate in traditional peacetime configurations, with launchers, missiles, and warheads stored separately, others now perform "high alert duty," maintaining a posture that enables rapid launch.[72] These changes support an emerging launch on warning (LOW) doctrine the PLA refers to as "early warning counterstrike."[73] Although Beijing's aspirations for a LOW posture date back to the 1970s, technical limitations long precluded its adoption. However, U.S. government assessments suggest that the construction of large missile fields are likely linked to China's present LOW ambitions. Additionally, the recent development of ground-based radars and space-based early warning systems complement these nuclear forces to enable what the DoD assesses will eventually be a LOW configuration "broadly similar to the U.S. and Russian posture."[74]

While uncertainty remains regarding the exact number of deployed missiles and warheads, the trajectory is clear: China's land-based nuclear forces are becoming more numerous, more survivable, more sophisticated, and more responsive. This evolution marks a decisive break from the constrained, low readiness model that defined the PLA's deterrent for decades and suggests that the PLARF is being restructured not merely to survive a nuclear exchange, but to operate credibly in scenarios that demand a rapid nuclear response. These developments suggest a shift from minimum deterrence to assured responsiveness, a posture that may complicate crisis stability and signal a broader and more aggressive evolution in Chinese nuclear strategy.

Air: For much of its nuclear history, China dismissed an air-delivered capability. While it developed several nuclear-capable bombers during the early phases of its nuclear program, the PLA Air Force's (PLAAF) role atrophied in the 1980s as the CCP prioritized land-based missiles.[75] As recently as 2017, the U.S. DoD assessed that the PLAAF "does not currently have a nuclear mission."[76] That assessment changed in 2018 when a DoD report identified that the PLAAF had been re-assigned a nuclear role, establishing a nuclear triad for the first time in China's history.[77] The clearest indicator of this shift came in 2019 when China unveiled the H-6N bomber during the PRC's 70th anniversary parade. The H-6N is designed for long-range precision strikes and differs from earlier variants in two key aspects: (1) It is capable of aerial

refueling and, (2) in can externally carry a nuclear-capable air-launched ballistic missile (ALBM).[78] Although China's aerial refueling capacity remains limited, these modifications extend the bomber's operational reach and enable credible strike options across the Indo-Pacific, marking a meaningful revitalization of China's air-based nuclear deterrent. China is also developing a next-generation strategic bomber, the H-20, which is widely expected to feature low-observable (stealth) technology, long-range endurance, and nuclear strike capability.[79] Though unconfirmed, the H-20 is believed to be designed for operations as far as Australia and is anticipated to enhance the credibility, survivability, and flexibility of China's airborne deterrent.[80] The development of sophisticated nuclear bombers likely reflects a shift in how Beijing views the role of its air leg as not only a delivery platform but also as a strategic messaging tool.

Indeed, China appears to be adopting a more deliberate air-based approach to strategic signaling. The U.S. has long leveraged the bomber leg of its nuclear triad to demonstrate resolve through publicized flights and joint patrols. Historically, China avoided such overt signaling, favoring restraint and ambiguity. That may be changing. In 2024, the PLAAF deployed H-6N bombers in joint patrols with Russian aircraft over the Sea of Japan.[81] Later that year, two Chinese H-6K bombers entered the Alaska Air Defense Identification Zone alongside Russian counterparts.[82] Although the H-6K is not assessed by the U.S. as being a nuclear-capable system, Chinese media has described it as dual-use since 2016.[83] While the PRC has not publicly explained the intent behind these missions, the choice of platform, partner, and geography suggests an emerging willingness to use bomber deployments for strategic signaling. If sustained, this pattern could signal a continuing doctrinal evolution, a shift from a purely retaliatory posture toward one that includes more visible displays of readiness and resolve. Whether or not the aircraft involved are nuclear-armed, their role in international airspace conveys a message; China is developing not only the tools of deterrence, but also the habits to support nuclear signaling and escalation management.

Sea: China's pursuit of a credible sea-based nuclear capability has been gradual but transformative. Although the PLA Navy (PLAN) fielded its first nuclear-powered ballistic missile submarine (SSBN) in 1987, it wasn't until the introduction of the Type 094 JIN-class SSBN in 2015 that Beijing achieved a meaningful undersea deterrent.[84] As of 2024, the PLAN operates six JIN-class SSBNs, each capable of carrying up to 12 submarine-launched ballistic missiles (SLBMs).[85] According to the DoD, these submarines now conduct near-continuous deterrent patrols, primarily in the South China Sea and the Bohai Gulf, establishing the sea leg of China's nuclear triad as a sustained operational presence.[86] Until recently, the effectiveness of China's sea-based deterrent was constrained by the limited range of its JL-2 SLBM. To target the eastern continental U.S., Chinese SSBNs would have had to operate well beyond their home waters, potentially as far as Hawaii. Such extended patrols undermine stealth and survivability, compromising the core function of the platform. However, that limitation is being overcome. The DoD assesses that China has begun to field the JL-3, an extended-range SLBM capable of

reaching the U.S. mainland from within Chinese littoral waters.[87] This development dramatically improves the survivability and credibility of China's sea-based deterrent by reducing the need for forward deployments and allowing SSBNs to operate under the protective umbrella of China's near-seas anti-access and area denial (A2/AD) systems.

Further advancements are expected with the next-generation Type 096 SSBN. Although its progress has been delayed, this platform is anticipated to be quieter, more survivable, and equipped with a new long-range, MIRV capable SLBM.[88] If realized, the combination of acoustic stealth and MIRV capability would mark a significant leap in the PLAN's ability to conduct secure second-strike operations from a mobile, concealed platform. Strategically, the maturing of China's SSBN force enhances the resilience of its overall nuclear posture. Chinese analysts have long viewed submarines as the most survivable component of a deterrent force due to their mobility, stealth, and ability to operate covertly across vast oceanic spaces.[89] According to Chinese strategist Yan Lianxin, SSBN patrols "expand the combat area" by operating in open oceans and can "increase the surprise" of a nuclear strike.[90] By maneuvering closer to target areas, SSBNs may also be viewed as more capable of penetrating enemy air defenses, further complicating adversary planning and enhancing China's second-strike credibility.[91]

A credible SSBN force gives Chinese leaders greater confidence in their ability to absorb a first strike and retaliate, reducing the pressure to escalate early in a crisis and bolstering strategic stability from Beijing's perspective. Yet it also enhances China's ability to project assured retaliation in regional or global contexts. As with other legs of China's triad, the PLAN's evolving SSBN capability suggests a transition away from minimalism and toward a posture better suited for crisis signaling, operational flexibility, and global competition.

Next-Generation Capabilities: Among the most consequential components of China's nuclear modernization is its investments in next-generation delivery systems. Chief among these are hypersonic glide vehicles HGVs and a fractional orbital bombardment (FOB) system, both of which represent a leap in strategic reach, survivability, and first-strike potential. These technologies are designed not merely to enhance accuracy, but to bypass and neutralize the traditional pillars of U.S. early warning and missile defense.[92] In July 2021, China tested what U.S. officials later identified as a FOB system equipped with an HGV payload.[93] This system launched a payload into low Earth orbit, released a maneuverable glide vehicle, and then de-orbited towards its target.[94] Unlike traditional ballistic missiles, which follow predictable trajectories and are tracked by radar arrays oriented over the North Pole, a FOB-HGV combination can approach from virtually any direction along an unpredictable flight path.[95] The U.S. DoD assesses that this system is likely intended to support a nuclear mission.[96] This capability poses a severe challenge to the United States' strategic warning architecture. For example, by exploiting blind spots in southern hemisphere coverage, FOB systems can evade existing detection frameworks, undermining the foundational assumption that a strategic nuclear strike would be visible with sufficient warning to enable decision-making.[97] These delivery systems threaten to compress timelines for response, obscure intent, and complicate attribution,

all of which introduce new friction into crisis management. Then-Deputy Chief of Space Operations Lt. Gen. B. Chance Saltzman warned that the PRC's 2021 test could offer Beijing a "first-mover advantage" in a crisis.[98] The strategic implications are profound. FOB systems undermine predictability by circumventing early warning protocols, they accelerate escalation timelines, increase the likelihood of miscalculation, and create new incentives for preemption. In this light, China's pursuit of these technologies cannot be viewed as a marginal add-on to its existing triad. Rather, it reflects a doctrinal shift toward ensuring strategic initiative under crisis conditions and contesting U.S. escalation dominance. The traditional model of minimum deterrence did not require these capabilities; China's current approach clearly does.

Conclusions

China's nuclear modernization has dramatically expanded the scale, diversity, and responsiveness of its strategic forces. What was once a minimalist, low-readiness arsenal has become a more survivable, flexible, and sophisticated deterrent. Across all three legs of the triad along with emerging technologies, Beijing has developed a nuclear force that emphasizes pre-launch survivability, penetration capability, and tailored response options.

Pre-launch Survivability: China has taken steps to enhance the survivability of its nuclear forces before a potential attack. Quantitative and qualitative upgrades to its nuclear launch sites, coupled with changes in posture, support this aim. A large, geographically dispersed land-based component complicates the feasibility of a disarming first strike. Upgrades to China's SSBN fleet and the ability to strike from China's littoral waters further strengthen survivability. Additionally, improvements to early warning systems and the development of high-alert protocols for certain PLARF and PLAN units increase the likelihood of a retaliatory launch prior to actually absorbing an incoming strike.

***Penetration Capabilities*:** Modernization initiatives clearly prioritize the ability for Chinese warheads to penetrate adversary defenses. This includes technological upgrades such as maneuverable reentry vehicles, penetration aids, and MIRV. Additionally, the sheer quantity of warheads and delivery systems being developed may serve to saturate and overwhelm missile defense networks. Capabilities such as SSBNs and FOB systems introduce new vectors of attack, potentially bypassing conventional early warning systems and complicating defense planning.

***Tailored Response Options*:** China's modernization supports a more nuanced and flexible deterrent posture. The range of delivery systems and warhead yields under development suggest that the PRC is preparing for a broader spectrum of conflict scenarios—from limited regional contingencies to full-scale strategic retaliation. Long-range ICBMs with multi-megaton warheads expand China's ability to target U.S. cities and military infrastructure, while lower-yield, regional systems like the DF-26 offer options for a proportionate response. These developments enhance China's ability to engage in more deliberate nuclear signaling and strengthen its coercive leverage across multiple domains.

Taken together, these developments mark a decisive break from China's historically austere nuclear model. The technical features of this modernization effort suggest a force posture

no longer optimized for symbolic deterrence, but for strategic initiative. As the next section will explore, this transformation cannot be understood through capabilities alone. It reflects deeper shifts in how Chinese leaders perceive risk, deterrence, and the role of nuclear weapons in a more contested global order.

Drivers of Nuclear Modernization

While the scale and pace of China's modernization efforts are readily observable, the strategic intent behind these developments remains a matter of debate. To understand the implications of China's evolving nuclear posture, it is essential to examine the underlying political, military, and doctrinal motivations shaping its decisions. From a military-technical perspective, China's nuclear modernization is driven by a desire to maintain a credible second-strike capability in the face of changing threats in the global strategic environment. The PLA has long feared that improvements in U.S. missile defense systems, long-range precision strike weapons, and intelligence, surveillance, and reconnaissance (ISR) capabilities could neutralize its limited arsenal in a first strike. These fears are not new, but they have been sharply amplified by advancements in U.S. conventional prompt global strike systems and real-time global ISR networks. Evolving strategic conditions, particularly shifts in U.S. capabilities, have increased China's perceived requirements for their nuclear capability. From a political perspective, China seeks to achieve absolute gains in power and status by creating a nuclear force symbolic of its great power status. Simultaneously, nuclear modernization provides relative gains vis-à-vis the United States, which Beijing considers its primary strategic rival. A more sophisticated nuclear arsenal acts as a strategic counterbalance and enhances political stability in the U.S.-China relationship.

Military-Technical Drivers

Historically, Beijing accepted a position of asymmetric strategic stability; one in which the United States retained overwhelming nuclear superiority, but mutual vulnerability was preserved through China's assured second-strike capability. However, over the past decade, Chinese officials and analysts have begun to question whether that balance still holds. The perception that U.S. military developments undermine China's ability to credibly hold the United States at risk, has led many in Beijing to reassess the nuclear force requirements necessary to maintain deterrence.[99] The DoD and DIA report that China's nuclear modernization is partly driven by the belief that it must directly counter U.S. military advantages.[100] These include not only superior U.S. nuclear capabilities, but also a growing suite of conventional precision strike systems, missile defenses, and ISR assets that collectively threaten to erode China's retaliatory potential. Chinese military writings frequently cite U.S. advancements in missile defense and long-range precision strike capacity as destabilizing elements in the deterrence relationship.[101] The 2013 edition of *Science of Military Strategy* (SMS) warns that these technologies weaken China's nuclear deterrence effectiveness.[102] The 2020 edition echoes this concern, arguing that

U.S. missile defense development has "broken the original fragile and stable state of mutual deterrence."[103] In this context, China's pursuit of advanced systems such as HGVs and FOB platforms can be seen, at least in part, as an effort to penetrate or circumvent perceived U.S. defensive superiority.

Concerns about U.S. offensive capabilities, particularly in the conventional domain, have focused Chinese attention on improving the survivability of its nuclear forces. Chinese strategic thinkers increasingly worry that the United States might exploit its ISR and precision strike advantages to carry out a disarming conventional first strike. PLA writings emphasized this possibility with the 2013 SMS flatly stating that U.S. conventional attacks "will" target Chinese nuclear forces, potentially placing Beijing in a passive strategic position.[104] These anxieties were further inflamed by the U.S. withdrawal from the Intermediate-Range Nuclear Forces (INF) Treaty in 2019 which Chinese analysts interpret as a signal that the United States may deploy land-based conventional missiles in the Indo-Pacific, systems that could threaten China's nuclear infrastructure with speed and precision. [105] These technical concerns are magnified by Chinese interpretations of U.S. strategic intent. Chinese commentators increasingly argue that the United States is shifting from a posture of deterrence to one of potential nuclear warfighting.[106] Analysts point to the evolving language in successive U.S. Nuclear Posture Reviews, particularly since the early 2000s, as evidence of a more aggressive stance toward Beijing.[107] Importantly, these themes appear to shape Chinese thinking at the highest levels. The U.S. Director of National Intelligence reported that Chinese leaders "worry that bilateral tension, U.S. nuclear modernization, and PLA advancing conventional capabilities have increased the likelihood of a U.S. first [nuclear] strike."[108]

This perception of an increasingly aggressive U.S. warfighting strategy, coupled with the belief that the United States possesses both the means and intent to negate China's second-strike capability, has significant implications for how Beijing evaluates its own deterrent. In this context, China's nuclear expansion and diversification emerge as a logical response to a deteriorating perception of strategic stability. Such perceptions also help explain key features of China's evolving force posture. The construction of three large ICBM silo fields, for instance, may be designed to act as a "target sponge," complicating any attempt by the United States to execute a successful disarming first strike. Investments in mobile launch platforms, hardened infrastructure, decoy systems, penetration aids, and other survivability enhancements reflect a broader effort to strengthen retaliatory assurance in the face of growing technological and strategic pressure. China's perception of nuclear vulnerability also extends beyond its bilateral relationship with the United States. Chinese strategists increasingly frame their deterrent posture in light of a more complex and multipolar nuclear environment. The 2013 *Science of Military Strategy* cites the growing number of nuclear-armed states on China's periphery as a key challenge.[109] India, for example, is seen by Chinese analysts as having tailored its nuclear strategy around deterring China.[110] North Korea, despite a formal defense agreement with Beijing, is described in Chinese writings as a volatile actor. One Chinese analyst likened North Korea's nuclear capability to "a sword hanging over the heads of the people in Northeast

China."[111] These varied perceived threats create further pressure to enhance China's nuclear capacity, however Chinese perceptions of military-technical vulnerability are not shaped exclusively by external threats.

Internal assessments of China's own strategic forces also appear to influence modernization efforts. In a 2012 speech to the PLA's nuclear forces, Xi Jinping underscored concerns about the combat readiness, ideological reliability, and professional competence of China's strategic units.[112] These comments suggest that doubts about Beijing's deterrent credibility are not solely imposed from abroad but are also rooted in longstanding concerns about the integrity and effectiveness of its own nuclear enterprise. While some of these critiques reflect political imperatives, such as ensuring party loyalty within the PLA, they also point to deeper anxieties about the readiness and resilience of China's nuclear forces. This sense of vulnerability is further amplified by changes to China's domestic infrastructure. In the early decades of its nuclear program, China's strategic geography reinforced its confidence in asymmetric deterrence. With a vast landmass, mountainous terrain, and historically low levels of urbanization, China believed it could absorb a first strike and still respond. In the 1950s, only 13 percent of the population lived in cities. However, today, that number has risen to over 65 percent representing a striking shift in population centers.[113] Mao's early confidence that China couldn't be subjugated by nuclear strikes was likely true. However, the demographics of the PRC, impressive industrial centers, and more urban populations means that today China can be subjected to nuclear threats in a way that wasn't possible in the past.

Political Drivers

Military-technical factors provide a compelling impetus for modernization; however, they do not fully explain the scale, pace, and sophistication of China's nuclear expansion. Political ambitions have played a parallel and reinforcing role. The current wave of nuclear development marks the first time in China's history that it has possessed the economic and industrial capacity to field a world-class deterrent. With growing material means, Beijing has become increasingly inclined to translate its national power into military prestige. The result is a nuclear program designed not merely to correct vulnerabilities, but to reflect China's ascendant status and to influence global perceptions of its inevitability as a great power. Xi Jinping has anchored nuclear modernization within his broader vision of national rejuvenation. Since taking office in 2012, Xi has repeatedly emphasized the need for a "world-class military" to support China's global ambitions.[114] To that end, Xi expressed the "need to strengthen ourselves in all aspects, especially to strengthen deterrent capabilities."[115] Framed by this thinking, nuclear weapons play an explicitly political role, they project national strength, reinforce international status, and deter external pressure. Xi has consistently sought to project confidence in the inevitability of China's global ascension.[116] He appears to reason that if the international community, particularly the United States, accepts this trajectory as unavoidable, it may eventually abandon resistance and adopt a more conciliatory posture. A stronger strategic military position, particularly in the nuclear domain, is a critical component of this signaling effort. Xi likely believes that a more

powerful nuclear arsenal will have a powerful psychological effect on Western leaders, reducing their willingness to confront or provoke China.

This perspective reflects a broader evolution of China's nuclear utility from a minimalist deterrence posture to one of strategic and symbolic assertion. Senior CCP and PLA officials increasingly frame China's nuclear arsenal as a core indicator of national power.[117] The 2020 *Science of Military Strategy* underscores this shift, explicitly calling for a nuclear force "commensurate with China's international status."[118] U.S. DoD assessments echo this view, suggesting that the PLA's nuclear expansion is likely linked to a broader military strategy aimed at positioning China as a competitive global power, and is almost certainly driven by long-term perceptions of an intensifying Sino-U.S. strategic rivalry.[119] Similarly, DIA concludes that China's modernization efforts are "almost certainly" intended to support enduring competition with the United States and to facilitate broader strategic ambitions.[120] Independent analysts concur, noting that as China's comprehensive national power has grown, so too has its ambition to field a nuclear arsenal that not only rivals the sophistication of established superpowers but also clearly distinguishes it from second-tier nuclear states such as Britain, France, and India.[121] These converging perspectives underscore a shared recognition of the political symbolism and strategic intent behind China's nuclear expansion

Embedded within this evolution is an implicit acknowledgment of the United States as China's principal strategic benchmark, both as a perceived threat and as a measure of parity. As China's nuclear arsenal grows, so does its ability to serve as a tool of political leverage in managing the U.S.-China relationship. Xi Jinping assumed power amid intensifying concerns over the Obama administration's "Rebalance to Asia" and the possibility of a more confrontational U.S. strategy. From the outset of his tenure, Xi anticipated a turbulent trajectory for U.S.-China relations, recognizing that China's continued economic ascent would shift the global balance of power and provoke strategic pushback.[122] In a 2015 speech, Xi declared that China stood "closer than ever" to center stage in global affairs, while warning that the more China developed, the greater the external pressure it would face.[123] This framing indicates an emerging unwillingness to accept asymmetric stability and provides political justification for nuclear modernization as a strategic safeguard in an increasingly competitive environment. Chinese foreign policy scholars reinforce this narrative. They argue that U.S. efforts to slow or contain China's rise have intensified as the power gap narrows. [124] Nuclear modernization is viewed not simply as a military necessity but also as a tool to shift the U.S. risk calculus and deter coercive strategies. Chinese strategists have long regarded U.S. nuclear superiority as a source of political coercion, enabling Washington to pursue aggressive foreign policy postures under the umbrella of strategic dominance.[125] Some Chinese analysts even contend that even Beijing's historically restrained nuclear posture was shaped by a desire to blunt this "emboldening effect."[126] During a 2016 visit to the PLA Rocket Force, Xi referred to China's nuclear forces as the nation's "trump card" to "awe and intimidate" adversaries, suggesting a belief that a more advanced nuclear arsenal can psychologically constrain U.S. decision-making.[127]

U.S. defense assessments closely track with this interpretation. DIA assesses that China increasingly views the United States as intent on containing China's rise resulting in a greater willingness to confront Washington in areas where interests diverge.[128] The DoD similarly reports that Beijing likely believes a more robust nuclear force is needed to deter U.S. intervention, hedge against nuclear escalation or a first strike, and exert greater control over the scope and scale of escalation during a conflict, capabilities that China's previously limited and less diversified arsenal could not support.[129] In this regard, China's nuclear buildup serves not only to deter nuclear attack but also to reduce Washington's perceived freedom of action. Analysts often refer to this approach as "counter-nuclear coercion," a strategy through which Beijing seeks to erode the utility of U.S. nuclear dominance as a coercive instrument.[130] The expansion of China's nuclear force thus appears not only as a response to evolving military requirements, but also as a form of strategic messaging intended to dissuade containment and compel more cautious U.S. behavior.

These developments, rooted in both strategic insecurity and political ambition, raise important questions about the direction of China's nuclear strategy. As China has acquired a more capable and survivable arsenal, it has also adopted policies and behaviors that suggest a shift in doctrinal thinking. This includes indications of a transition from a traditionally limited readiness posture toward a more responsive force, growing emphasis on counter-intervention capabilities, and increased ambiguity around the scope and credibility of China's declared no first use policy. It remains unclear whether these shifts were the intended outcome of modernization, or whether modernization itself has enabled a more assertive shift in nuclear thinking. In either case, the convergence of capability and ambition marks a meaningful transformation in how China views the role of nuclear weapons in its broader national security agenda.

Implications

A central risk emerging from China's nuclear modernization is the widening gap between its growing capabilities and its long-standing stated policy. Beijing continues to maintain its NFU pledge and categorizes its arsenal as retaliatory in nature, yet the scale and sophistication of its modernization suggest the potential for far greater operational flexibility. Launch-on-warning, dual-capable platforms, and a range of yield and delivery options indicate that the PLA is increasingly prepared to manage conflicts across scenarios from regional crises to strategic exchanges. This disparity between doctrine and capability creates uncertainty about Beijing's true intentions. At the same time, both Western assessments and official Chinese sources, including DoD and DIA reports, PRC defense white papers, and repeated statements by Chinese officials, affirm that NFU remains consistent with China's approach to nuclear weapons and is unlikely to change in the near term.[131] PLA curricula and operational manuals similarly emphasize counterstrike and deterrence operations, not warfighting, as the mission of nuclear forces.[132] Additionally, China has historically refrained from issuing nuclear threats even in periods of acute tension. In short, while NFU remains operationally credible, it is at odds with capabilities that could be used more flexibly.

That tension matters because modernization has already equipped China with the tools to adjust its posture without formally changing its policy. As China becomes more militarily assertive, NFU constrains the leverage it can extract from nuclear forces, especially for deterring U.S. intervention in a Taiwan contingency or other fast-moving regional crisis. Some Chinese analysts have therefore begun to question whether greater flexibility, including conditional first-use, may be necessary to meet future security challenges.[133] Should the CCP conclude that NFU no longer serves its strategic objectives, it could pursue a functional shift in posture even without issuing a formal declaratory change. U.S. planners must therefore assume that while NFU remains Beijing's stated policy, it could be reinterpreted or reversed if leaders conclude their political objectives cannot be achieved through conventional means

Additionally, China's ambiguous intentions and increasingly formidable nuclear capabilities create an environment of uncertainty that inherently raises the stakes for global deterrence. This uncertainty carries sobering implications for the credibility of American extended deterrence and for global non-proliferation efforts. If confidence in Washington's ability to navigate this environment erodes, it could spur pressures for independent nuclear programs, demands for greater nuclear sharing, or shifts in allied posture, all of which would weaken non-proliferation efforts and strain alliance cohesion. The central challenge for the United States is to reinforce its credibility as a reliable security guarantor while carefully managing escalation risks. This requires striking a delicate balance: strengthening deterrence and assurance, but doing so in a way that avoids fueling Beijing's perceptions of vulnerability or aggressive containment, which could themselves drive greater instability.

At the regional level, the PLA undermines crisis stability through the entanglement of nuclear and conventional capabilities, most visibly in the dual-capable DF-26. In a confrontation over Taiwan or elsewhere in the Indo-Pacific, an adversary may be unable to distinguish whether a DF-26 launch is nuclear or conventional until after impact, creating dangerous uncertainty and heightening the risk of inadvertent escalation. This challenge extends beyond individual systems: China's integration of nuclear, space, cyber, and conventional forces blurs traditional boundaries between domains, complicating adversary decision-making and crisis management. In the absence of clear distinctions between nuclear and non-nuclear capabilities, even limited conventional operations could trigger miscalculation, cross-domain escalation, or destabilizing nuclear signaling.

In this environment of shifting strategic stability, the possibility of miscalculation at the strategic and operational level is profound. The United States should assume that Beijing can exploit nuclear flexibility even under restrained rhetoric, and shape its own choices to strengthen assurance while protecting crisis stability. The next section translates these implications into policy recommendations.

Recommendations

Based on the concepts described above, the U.S. policy must rest on four interlocking principles:

1. **Credibility**: Sustaining a capable, modern nuclear force remains essential to deterring Chinese aggression and maintaining extended deterrence.

2. **Clarity**: Strategic messaging, particularly around thresholds, signaling, and allied commitments, must be unambiguous and consistently reinforced.
3. **Restraint**: The U.S. should avoid policy shifts or military programs that validate Chinese threat perceptions or fuel reactive expansion.
4. **Communication**: Diplomatic and Track II dialogue with China is indispensable, even if formal arms control is not immediately achievable.

Together, these four principles provide the framework through which U.S. military and diplomatic measures must be developed and executed. Credibility demands that force modernization efforts preserve the reliability and survivability of the U.S. deterrent. Clarity requires that modernization efforts, strategic intent, and operational planning are accompanied by unambiguous messaging to allies and adversaries alike. Restraint underscores the importance of avoiding measures that would validate Chinese narratives of encirclement or fuel unnecessary competition. Finally, communication highlights that even the most disciplined military posture must be paired with sustained dialogue to mitigate misperception and manage escalation risks. When applied in concert, these principles ensure that U.S. policy responses are not a collection of discrete initiatives, but a coherent strategy that balances deterrence with stability. Building on this framework, the following sections outline two complementary lines of effort. Military measures focus on sustaining a credible and integrated deterrent posture, while diplomatic measures emphasize dialogue, transparency, and narrative management. Distinct in practice yet mutually reinforcing, this combined approach provides the balance of strength and engagement necessary to preserve stability in the face of China's nuclear modernization.

Military Measures

China's rapid nuclear expansion underscores the need for the United States to maintain a credible, survivable, and flexible nuclear deterrent. While the United States cannot afford to neglect the requirements of its own deterrent posture, it must also avoid steps that would reinforce Beijing's threat perceptions, legitimize arms racing behavior, or destabilize the broader strategic environment. The objective is to sustain deterrence without accelerating nuclear competition. Ongoing U.S. nuclear modernization efforts, such as the development of the Sentinel ICBM, Columbia-class SSBNs, and the B-21 bomber, are not only necessary to replace aging legacy systems but are foundational to preserving nuclear credibility in the face of evolving adversary threats. These programs reflect continuity in U.S. force structure, not expansion, and are consistent with long-established deterrence requirements. They provide assurance to allies, reinforce the credibility of U.S. commitments, and enable tailored deterrence across multiple adversary threat environments.

In the endeavor to strengthen U.S. capabilities, communicating intent is critical. China's historical experience of strategic inferiority and deep skepticism of U.S. motives makes any visible shift in American nuclear posture or capability politically consequential. Chinese strategists frequently characterize U.S. nuclear policy as aggressive, pointing to missile defense investments, global ISR infrastructure, and precision-strike capabilities as evidence of a damage-limiting or warfighting orientation. In this environment, the very steps the United States must take to sustain the credibility of its deterrent, modernizing forces, ensuring survivability, and maintaining operational flexibility, risk being interpreted as destabilizing or reactionary. That tension is unavoidable, but it can be managed. Modernization must be pursued in a disciplined manner, paired with clear and consistent messaging that emphasizes continuity rather than

expansion. The United States should explicitly communicate that modernization is not intended to negate China's second-strike capability, but to preserve its own deterrent in an increasingly contested multipolar environment. At the same time, Washington must actively counter narratives of U.S. aggressiveness by reaffirming its commitment to strategic stability, maintaining clear distinctions between nuclear and conventional missions, and elevating arms control and transparency as enduring policy objectives, even if formal engagement with China remains elusive.

Modernization is necessary but insufficient to manage the emerging challenges posed by nuclear buildup. China's nuclear modernization, including its growing inventory of dual-capable delivery systems, investment in launch-on-warning capabilities, and doctrinal ambiguity, demands a corresponding evolution in how the United States plans for, trains for, and operates under the threat of nuclear use. A central component of this response is improved Conventional-Nuclear Integration (CNI); not to blur the line between nuclear and conventional operations, but to ensure that both domains are prepared to function coherently in a contested strategic environment. While the DoD has not formally defined CNI, it broadly refers to the ability for joint/combined forces to operate in, around, and through a nuclear environment.[134] This capability directly supports the National Defense Strategy mandate to unambiguously demonstrate that adversarial nuclear escalation will not impede US, Allied, or partner warfighting objectives.[135] What is often lacking from the American concept of CNI is the complex role of both conventional and nuclear forces in escalation management, particularly in the context of a conventional conflict against a nuclear-armed adversary. Done effectively, CNI will improve the U.S. military's ability to manage escalation, operate under nuclear threat conditions, and credibly deter coercion without adopting more aggressive postures or declaratory policies.

Historically, U.S. nuclear and conventional forces have operated within largely distinct institutional and operational frameworks. While the United States employs dual-capable aircraft, it maintains separate force structures and command authorities for its nuclear and conventional forces, a deliberate distinction that supports strategic signaling, reinforces civilian control, and preserves escalation boundaries. By contrast, the PLA increasingly emphasizes dual-use systems and cross-domain ambiguity, complicating efforts to interpret signaling or constrain escalation during a crisis. U.S. CNI efforts must not mirror this posture. Instead, they should mitigate historical stovepipes and enable integrated planning, training, and operations that reinforce clarity, cohesion, and escalation control. In the decades following the Cold War, U.S. conventional strength and a relatively stable strategic environment reduced the perceived utility of nuclear weapons in military planning. Nuclear considerations gradually faded from conventional exercises, contingency planning, and professional military education. As a result, U.S. forces have operated for decades in environments largely free of credible nuclear threats, contributing to the atrophy of escalation awareness and institutional readiness. However, today this approach is increasingly untenable. As the PLA fields systems explicitly designed to deter U.S. intervention in regional contingencies, and as China's leadership becomes more willing to accept risk in pursuit of political objectives, the United States must rebuild the conceptual and operational foundations necessary to conduct joint operations under nuclear threat conditions. To be effective, CNI must serve a dual purpose. First, it must align U.S. nuclear and conventional operational practices, doctrine, and planning to enable coherent crisis management. Second, it must equip the Joint Force with the tools, structure, and routines required to sustain combat

operations in, around, and through nuclear-threatened or nuclear-affected environments. This requires cross-functional planning, deliberate investments in integration, and a renewed institutional focus on escalation dynamics.

Revising planning processes at the operational and strategic levels must be informed by both nuclear and conventional realities. Nuclear planners must understand conventional objectives, constraints, and tempo, while conventional commanders must incorporate nuclear risk into their decision-making frameworks. This requires the systematic embedding of nuclear expertise into conventional planning staffs, deliberate talent development to foster cross-domain fluency, and recurring opportunities for interaction between nuclear and conventional communities. Such coordination enhances decision-making in crisis scenarios, improves escalation control, and reduces the risk of misalignment that adversaries could exploit during a confrontation. CNI must also be exercised and rehearsed. The Joint Force must regularly conduct multi-domain wargames and field exercises that simulate operations in a nuclear-contested environment. These events should expose conventional forces to adversary nuclear signaling, simulated nuclear use, and degraded operational conditions to test whether U.S. forces can sustain momentum, achieve objectives, and manage escalation. Critically, these rehearsals must move beyond tabletop analysis to include live, integrated force participation across services and components. This not only uncovers vulnerabilities in current doctrine and operations, but also conditions leaders to make decisions under pressure and uncertainty, an essential requirement for credible deterrence.

These efforts carry unavoidable strategic risk. China will almost certainly interpret U.S. CNI rehearsals as evidence of hostile intent, reinforcing its own threat perceptions and potentially fueling further nuclear expansion. Such reactions cannot be ignored, but they must also not deter preparation. The greater danger lies in failing to develop the operational tools, habits, and fluency needed to manage escalation in a real crisis. A Joint Force unpracticed in operating under nuclear threat conditions would be far more likely to miscalculate, escalate inadvertently, or falter under pressure, outcomes that would magnify instability rather than reduce it. The challenge, therefore, is not whether to conduct CNI training, but how to do so responsibly: pairing disciplined operational preparation with careful messaging, transparency where feasible, and a consistent emphasis on defensive intent. In this way, the United States can mitigate the risk of feeding adversary narratives while ensuring its forces remain ready to manage escalation at the operational level. Just as importantly, effective CNI serves as a tool of strategic influence. By demonstrating that the Joint Force can fight through nuclear threats and still achieve its objectives, the United States can disabuse Beijing of the notion that limited nuclear use or coercive signaling will yield political gains. A force that is trained, integrated, and prepared to operate under nuclear threat conditions not only reduces operational risk, but also reinforces the credibility of U.S. extended deterrence and signals that nuclear coercion is strategically futile.

Diplomatic Measures

While crucial, U.S. diplomatic efforts to reduce nuclear risk with the PRC are clearly challenging. Near-term prospects for formal arms control are limited, and the absence of regular communication channels, particularly in crisis scenarios, exacerbates the danger of misperception, miscalculation, and escalation. China's nuclear posture, shaped by opacity and doctrinal ambiguity, compounds this risk. Rebuilding strategic dialogue is therefore essential as a safeguard against inadvertent conflict. Despite repeated efforts by the United States to initiate

bilateral nuclear discussions, China has resisted such engagement, citing disparities in arsenal size and mutual suspicion.[136] Beijing has further insisted that strategic dialogue can only occur after the United States agrees to recognize mutual vulnerability and commit to No First Use, positions that Washington cannot accept without compromising the credibility of extended deterrence.

Still, these obstacles should not deter the U.S. from pursuing incremental, informal, and issue-specific engagement aimed at managing escalation risk. One avenue for near-term progress is the expansion of Track II and Track 1.5 dialogues, which allow U.S. and Chinese experts, including retired officials and military officers, to discuss sensitive topics in unofficial settings. These dialogues, while not binding, can generate mutual understanding, clarify intentions, and test ideas that may inform future policy. They are especially valuable for exploring doctrinal concepts that lack direct translation between Western and Chinese strategic culture, such as the interpretation of "deterrence," the role of signaling, and the relationship between nuclear and conventional operations. The United States should also pursue issue-specific, low-stakes bilateral engagement focused on risk reduction. Such topics might include early warning coordination and crisis communication protocols including hotline connectivity and the procedures for strategic messaging as well as continued notification of long-range missile tests, particularly during periods of heightened tension or military exercises. Even modest progress in these areas would improve mutual understanding and reduce the likelihood of unintended escalation. Such engagement also allows both sides to reinforce the idea that strategic restraint is in their mutual interest, even in the absence of broader strategic trust. Multilaterally, the United States should welcome and support China's increasing engagement in nuclear discussions such as the Non-Proliferation Treaty Review Conference. While China's proposals, such as its call for a multilateral No First Use Treaty, may be partially motivated by public diplomacy or normative positioning, they also offer a rare opportunity to gauge Beijing's preferred rules for the nuclear order.[137] The U.S. should neither dismiss these efforts nor adopt them wholesale. Instead, they should be treated as entry points for understanding China's strategic preferences and as potential platforms for consensus-building on risk reduction measures, especially among non-nuclear weapon states.

It is important to note that PRC has historically viewed strategic dialogue through a fundamentally different lens than the United States. Chinese writings often reflect skepticism that dialogue can be mutually beneficial, and Beijing frequently uses such forums to extract unilateral commitments or to reinforce existing narratives about American aggression. Recognizing this, the U.S. must approach diplomatic engagement with realistic expectations, clear boundaries, and a focus on process over outcome. Strategic dialogue should not be framed as a search for consensus, but as a means of managing cultural diversity. In the absence of such engagement, the risks of miscalculation will almost certainly rise. A crisis involving U.S. allies in East Asia, particularly in the Taiwan Strait, could unfold under compressed timelines, uncertain signaling, and doctrinal ambiguity. Without pre-established norms of communication or escalation control, both sides would face significant pressure to interpret actions with limited context, increasing the chance of inadvertent nuclear signaling or conflict. Ultimately, strategic dialogue is a hedge against such catastrophe. Even if doctrinal divergence persists, both nations have a shared interest in avoiding accidental escalation. Reestablishing communication channels, expanding informal engagement, and supporting risk reduction measures offer a realistic and stabilizing path forward, one that strengthens deterrence by making it more predictable, transparent, and resilient.

As China continues to modernize its nuclear forces, its strategic writings increasingly frame the United States as the source of instability. PLA analysts often depict U.S. nuclear strategy as opportunistic and aggressive, citing conventional precision strike systems, global ISR infrastructure, and missile defense networks as evidence of a broader effort to erode China's deterrent capacity and constrain its geopolitical ascent.[138] These narratives both justify China's nuclear expansion and present the PRC as a reluctant, reactive actor. Managing such perceptions is therefore essential. The United States must avoid rhetoric or actions that validate Chinese threat narratives, while simultaneously exposing the contradictions in Beijing's posture. Clear and disciplined messaging can blunt Chinese claims that U.S. systems are escalatory, while also underscoring that China's buildup occurs outside any transparency regime, even as it promotes disarmament rhetoric. Highlighting these contradictions weakens Beijing's credibility and creates diplomatic space for Washington to rally support for greater openness and reciprocal restraint.

Finally, the United States must continue to frame its alliances in the Indo-Pacific as stabilizing and defensive. Chinese analysts frequently describe U.S. alliances as tools of containment or aggression, reinforcing the perception that Washington seeks to encircle China militarily.[139] In response, the U.S. should underscore the historical, defensive nature of these partnerships and link them explicitly to the preservation of regional peace, order, and deterrence, not the pursuit of strategic dominance. Highlighting allied concerns about China's growing coercive capacity can help reframe extended deterrence not as escalation, but as reassurance. In this broader context, narrative management is not an adjunct goal to deterrence, it is central to it. Strategic competition with China is not merely a contest of capabilities, but of political perception and international legitimacy. If Beijing succeeds in casting the United States as the driver of instability, it may gain both domestic latitude and international sympathy for its continued nuclear expansion. But if the United States exposes the inconsistencies in China's posture, clearly articulates its own defensive rationale, and avoids reinforcing adversary narratives, it can maintain the moral and strategic high ground while limiting the incentives for further escalation.

Conclusion

China's nuclear modernization marks a critical juncture in the evolution of its strategic posture. While Beijing's official doctrine continues to emphasize restraint, the scale, diversity, and responsiveness of its emerging capabilities reflect a growing ambition to shape regional outcomes and challenge U.S. deterrence strategy. The result is an increasingly ambiguous and even contradictory posture that blurs the line between political signaling and warfighting capacity, raising serious questions about the future of strategic stability in the Indo-Pacific and beyond. At its core, China's nuclear expansion represents a departure from the principles of minimalism that defined its nuclear identity for decades. Whether this transition was the goal of modernization or a consequence of it, the outcome is the same: The capability versus doctrine gap is widening, and the risk of miscalculation, coercive escalation, or doctrinal abandonment is growing. Even if Beijing retains its declaratory NFU policy, the strategic environment in which that pledge operates has fundamentally changed. For the United States, this shift demands neither complacency nor alarmism. It requires a deliberate and multidimensional strategy, one that integrates military preparedness with diplomatic initiative, deters first use while preserving escalation control, and reassures allies without provoking arms racing. Central to this strategy is a recognition that restoring transparency, reinforcing norms, and managing perceptions are as vital as force structure in maintaining stability. Therefore, U.S. policy must rest on the four

interlocking principles of credibility, clarity, restraint, and communication as outlined above. Ultimately, China's nuclear modernization presents a test, not only of American deterrence posture, but of its strategic discipline. The challenge is not merely to respond to changing capabilities, but to shape the conditions under which restraint remains viable and escalation remains avoidable. By anchoring its response in a balanced mix of strength, transparency, and engagement, the United States can navigate this emerging landscape without compromise.

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