The New Nuclear World

An exploration of the development of China’s nuclear arsenal, its implication on nuclear deterrence, and recommendations to prevent nuclear conflict.
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Key Terms

**PRC**: An abbreviation of "The People's Republic of China", the formal name of the state of China.

**CCP**: Founded in 1921, the Chinese Communist Party (CCP) have ruled China continuously since Mao Zedong claimed victory in the Chinese Civil War on October 1, 1949.

**PLA**: People's Liberation Army. Founded in 1927, the PLA is the sole legitimate military force in the PRC but is best understood as the armed wing of the CCP.

**ICBMs**: Intercontinental Ballistic Missiles (ICBMs) are defined by their land-based, nuclear-armed, status and their range of over 3,500 miles.

**MIRV**: The term Multiple Independent Reentry Vehicle (MIRVs/MIRVed) refers to ballistic missile payloads with several warheads capable of detaching mid-flight and targeting multiple separate targets.

**SLBM**: The term Submarine-Launched Ballistic Missile (SLBM) refers to nuclear-capable missiles launched from submarines.

**IAEA**: The International Atomic Energy Agency (IAEA) is the international body responsible for the monitoring of safe nuclear energy production and the prevention of nuclear energy facilities being used for military purposes.

**Nuclear Deterrence Theory**: The idea that the threat of nuclear weapons provides sufficient incentive against aggressive action that nuclear weapons become a force for stability without the need for use.

**Easy Deterrence**: This term, used by Keith Payne, describes the school of thought associated with Kenneth Waltz wherein, even in an anarchic international system, nuclear deterrence is stable and easy to establish since any logical consideration of nuclear use comes to the inevitable conclusion that it is clearly against one's self-interest due to an adversary's possession of nuclear weapons.

**Difficult Deterrence**: This term, also used by Payne, describes the school of thought wherein the rationality and caution assumed by the Easy Deterrence school are rejected. Instead, nuclear deterrence is precarious and a continued effort and incentive is required to sustain the long nuclear taboo. Payne, Wohlstetter, and the author of this report ascribe to this second view of deterrence.[1]
Introduction

China's nuclear arsenal is growing, rapidly. In all likelihood, by 2035 the world will face the challenge of three comparably armed nuclear superpowers. This development significantly complicates deterrence thinking, increases the already unacceptable nuclear threat to the survival of humanity, and necessitates a reorientation of international nuclear policy.

For the first time since the end of the Cold War the number of nuclear weapons in the world is rising. The CCP is yet to acknowledge the ongoing build-up or engage in meaningful multilateral arms control discussions. Meanwhile, the Russian government claims to have “suspended” the New START arms control treaty, a legally invalid but nonetheless concerning position, and the prospects for its renewal in 2026 remain bleak. Unless meaningful action is taken, the world may face a nuclear arms race with zero valid treaties or control measures existing between its primary protagonists.

Nuclear weapons are morally repugnant; they risk extraordinary humanitarian and environmental devastation on a daily basis while persistently diverting resources away from critical imminent human needs. China, the U.S., and all nuclear weapons states are global pariahs that insist on holding the world hostage for the sake of their global ambitions. The majority of global governments have expressed their opposition to this status quo and their desire for a nuclear weapons-free world through the passage of the Treaty on the Prohibition of Nuclear Weapons.[2]

Yet, since the Cold War, humanity has existed at the pleasure of U.S. and Russian military bureaucracies. New research suggests that, beyond the immediate death tolls caused by fire and radiation, 5 billion people could die as a result of the global famine that would occur following a nuclear war between Russia and the United States.[3] It is of great concern that China is seeking to join this despotic club rather than striving for positive change.

It is crucial to understand that the convergence of threats emerging from the dynamic interplay of three potential nuclear superpowers significantly undermines previous assumptions around global security. Assured retaliation, a core foundation of deterrence theory, is challenged by the potential existence of three comparable nuclear superpowers. The sort of stable, "easy," passively maintained deterrence espoused by Kenneth Waltz and others becomes harder to support in this new environment. Hawkish calls to immediately update and expand the U.S. nuclear arsenal fail to grasp the futility of this solution and the inevitability of the arms race it would create in the context of three-state deterrence. Deterrence must necessarily become viewed as complex, difficult, and requiring sustained cooperative action and mutual incentives between and amongst states.

Rather than doubling down on arms development, this is a crucial moment for international arms control and a reconsideration of nuclear force posture. Dialogue and transparency will be crucial in preventing a future nuclear conflict involving China. At present, U.S. nuclear doctrine does not reduce the likelihood of a costly and dangerous arms race and it lacks situational clarity over Taiwan and limited nuclear use.

This is an urgent moment for multilateral dialogue and transparency. Without it, the world moves ever closer to midnight.
The History of China's Nuclear Weapons

On October 1, 1949, Mao Zedong declared the creation of the People's Republic of China (PRC). The Chinese Civil War had ended and the Century of Humiliation came to a close. Despite its status as a fledgling political entity, the PRC was born with a firm sense of its place in history; as one of the world's oldest civilizations and pre-eminent powers. The demise of the Qing dynasty and the arrival of exploitative imperial powers in the mid-19th century are seen as aberrant. From the outset, the CCP perceived existential threats from foreign imperialists and the party sought to restore China's place on the international stage.

After the horrors of Hiroshima and Nagasaki, it was clear to Mao that China required a nuclear arsenal. The U.S. decision to deploy ten nuclear-armed B-29 bombers to the Pacific during the Korean War (1950-1953) - a conflict that both involved People's Liberation Army (PLA) troops and threatened Chinese sovereignty along the Yalu River - only strengthened this perception.

The Sino-Soviet Alliance

Less than four months after declaring independence, Chairman Mao signed the Sino-Soviet Treaty of Friendship and Alliance with the Soviet Union (February, 1950). The alliance was intended to form the basis for a decade of economic and military information exchange between the two states.

In 1955, China and the USSR began "full assistance" in nuclear development; the CCP was to send scientists to study in the Soviet Union, as well as surplus uranium mined in China, while the Soviets agreed to provide nuclear reactors and a cyclotron to the Chinese. Critically, the Soviets helped develop the Lanzhou Uranium Enrichment Plant that would produce the critical uranium for the program's subsequent development.

Project 596

"If our nation does not want to be intimidated, we have to have this thing." Project 596 was reflective of Mao's insistence on the independence of China from foreign control. Indeed, the project's very name is in reference to the separation of the program from Soviet influence - in June 1959. By July of 1960, all Soviet nuclear scientists had returned to the USSR.

In spite of this drive for national independence, the defection of American physicist Joan Hinton is speculated to have been critical to the nuclear project. Having worked at Los Alamos and witnessed the Trinity Test, she moved to China in 1949 and is believed to have shared critical information.

Progress slowed as the Great Leap Forward proved economically disastrous, but by 1964 the Lanzhou plant had enriched a critical quantity of uranium. On October 16, 1964, China successfully tested its first atomic weapon, becoming the world's fifth nuclear state.

While declaring a successful test, the CCP denounced nuclear weapons as "paper tigers" with limited use except avoiding coercion from the U.S. Additionally, they formally announced, "the Chinese Government hereby solemnly declares that China will never at any time and under any circumstances be the first to use nuclear weapons."

Less than three years later, China successfully detonated its first hydrogen bomb.
Following the death of Mao Zedong (1976), the PRC began a period of economic stabilization and increased international normalization. By 1984, China had joined the International Atomic Energy Agency (IAEA) and agreed to place its nuclear exports under international safeguards. By 1992, China acceded to the terms of the Nuclear Non-Proliferation Treaty (NPT) and was officially recognized as a nuclear weapons state.

**Proliferation**

There are significant questions, however, regarding the CCP's stance on non-proliferation. Chinese officials opposed the 1963 above-ground nuclear testing moratorium, claiming it was a shallow attempt to "tie up the hands and feet of all peace-loving countries" by monopolizing nuclear technology in imperialist hands.[8]

Further, China is accused of fast-tracking Pakistan's nuclear weapons development. According to Abdul Qadeer Khan, father of Pakistan's program, a Pakistani military plane left China in 1982 with enough weapons-grade uranium to develop two atomic bombs. It is also believed China provided two nuclear-capable M-11 missiles to Pakistan in 1990 and 1992.[9]

Meanwhile, China has been tolerant of nuclear weapons development in North Korea, continuing a political alliance that dates back to the Korean War, whilst reportedly providing nuclear technology to Saudi Arabia and violating Western sanctions on Iran.[10][11]

**A New Era**

In the words of Xi Jinping, November 2015 marked a "new and historic starting point" in China's military history. The announcement signalled a significant restructuring of the PLA across the board. Critical here is that the division formerly known as the Second Artillery Corps was replaced by the PLA Rocket Force and was promoted to full-service status. The PLA Rocket Force is in charge of all of China's land-based nuclear weapons. The changes were accompanied by a 300,000-person reduction in the PLA and a broader shift away from China's massive land-based strength towards modern military capabilities. Xi has since described the Force as indispensable.[12]
China's Present Nuclear Arsenal

Overview

Since China's recognition as a nuclear weapons state, it has expanded its nuclear arsenal significantly. While precise tracking is difficult - the CCP does not release official figures - the arsenal has expanded most dramatically since 2015. Although a significant margin smaller than that of the United States or Russia, China possesses the world's third-largest nuclear arsenal.

In 2020, China's arsenal was estimated at 200 nuclear warheads. However, the Pentagon now estimates the PRC possess 500 operational nuclear warheads (May 2023). The Bulletin of Atomic Scientists maintains a more conservative estimate of approximately 410 nuclear warheads (March 2023). The Pentagon previously believed China would not reach this level until 2030. The majority of the force is kept on peacetime status with separated launchers, missiles, and warheads. However, the PLA Rocket Force conducts monthly combat readiness exercises and "high alert" duties. These exercises include placing missiles on ready-to-launch and standby positions. It is unclear how long these stances are maintained.[13]

In line with China's attempts to match American and Russian nuclear strength, it now possesses a complete nuclear triad with nuclear-capable missiles deployed from land, air, and sea.

Land

The PLA possess DF-5A and DF-5B silo-based missiles, capable of striking North America, with an estimated range of 8,100 miles. The DF-5B is capable of carrying 5 Multiple Independent Reentry Vehicles (MIRV). In addition, China holds DF-31 and DF-41 road-based missiles with a range between 4,500 and 9,300 miles. The DF-41 is China's first road-mobile ICBM with MIRV capability.

Sea

China possesses 6 JIN-Class nuclear submarines. Each carries 12 nuclear-capable Submarine Launched Ballistic Missiles (JL-2 and JL-3 Class). These submarines operate near-continuous at-sea patrols. The JL-3 missiles are capable of reaching the U.S. from the South China Sea. A Type 096 submarine is in development with the ability to launch SLBMs with MIRV capability.

Air

The PRC completed its nuclear triad in 2019 with the announcement of the H-6N bomber. The H-6N derives from earlier PLA models but its air-to-air refueling capacity, combined with an altered fuselage, makes it capable of a range of 1,100 miles and of firing air-launched nuclear-armed missiles.[14]
Plans & Projections for Growth

Rising Budgets, Lofty Goals

In 2022 the PLA’s budget rose by 7.1%, to nearly 300 billion dollars. This marks the twentieth consecutive year in which the Chinese military budget has grown.

As part of the CCP’s broad ambition to see the “Great Rejuvenation of the Chinese Nation” by 2049 - the centenary anniversary of the PRC - the CCP is investing heavily in the creation of a “world class” military by 2027 - the centenary anniversary of the PLA. The CCP seeks to accelerate the integration of mechanization, informatization, and intelligentization of the PRC’s security apparatus to aid China’s rise to become a “global leader in terms of comprehensive national strength and international influence.”

Indeed, the 2022 U.S. National Security Strategy identified the PRC as “the only competitor with the intent and, increasingly, the capacity to reshape the international order.”[15]

It is worth noting that, even if you add in the additional 83 billion dollars the Stockholm International Peace Research Institute contend the PRC excludes from its stated budget, Chinese military spending remains nearly $600 billion dollars lower than that recommended in the most recent U.S. military spending proposal.[16][17]

ICBMs and Silo Fields

The PRC has been expanding its nuclear arsenal at a remarkable rate and it is set to expand further. Its nuclear arsenal already exceeds the level predicted for 2030 by the Pentagon just two years ago, while The Pentagon believes China has “probably completed” three new ICBM silo fields.

These fields are expected to house at least 300 silos. It is unknown exactly how many missiles will be housed here.

The Pentagon estimates China will possess 1,500 ICBMs by 2035, achieving parity with the U.S. and Russia's ICBM strategic warheads. It is worth noting that the U.S. and Russia possess significantly greater numbers of non-ICBM nuclear weapons.[18]

Fissile Materials

The Pentagon's estimates for the rise in nuclear warheads takes into account China's increasing capacity to produce and separate plutonium. China is constructing two CFR-600 sodium-cooled fast-breeder nuclear reactors. While these new facilities are consistent with China's domestic nuclear energy program, the CCP's official military-civil fusion strategy and the scale of silo development leads to speculation that these facilities will aid the planned increase in nuclear weapons. Each of these reactors is capable of producing dozens of nuclear warheads annually from the uranium placed around the field core for the purpose of breeding plutonium - these are known as uranium blankets. China has refused to report its stockpiles of separated plutonium to the IAEA since 2017.[19]
Military Development

Military-Civil Fusion

As part of the CCP's efforts to accelerate the transition to world-class military status, the government has committed to a policy of Military-Civil Fusion (MCF). MCF is designed to facilitate the rapid integration of private-sector research and development with military technology.

This effort includes Multi Domain Precision Warfare, an attempt to coordinate command, control, intelligence, and surveillance from the traditional intelligence sector to cyber and space.

The policy aims to utilize the potential of AI and data analysis to identify key weaknesses and opportunities in the international system. The 2049 transition is designed to make China a leader not in conventional warfare but in the military technology of the future.

Hypersonic Glide Missiles

The development of Hypersonic Glide Missiles is a central piece of China's forward-looking project. In July 2021, China shocked U.S. intelligence by successfully conducting a fractional orbit launch of a nuclear-capable hypersonic missile. The missile travelled an extraordinary 25,000 miles - three times further than China's existing range - and remained in orbit for a record-breaking period of time (over 100 minutes).[20]

Conventional defense systems use parabolic calculations that accurately predict the path, duration, and speed of a missile. This is critical to existing anti-missile defense systems. The glide trajectory exhibited here disrupts those calculations. Not only does the low orbit allow the missile to evade detection longer, but the in-flight maneuverability and non-parabolic path of the missile makes both target and timing difficult to predict.[21]

Other

Chinese DF-5B silo-based missiles are capable of carrying up to five MIRVs. MIRVs differentiate from ordinary missiles; after launch, each vehicle may separate from the original launch trajectory, fly independently, and hit multiple individual targets. This technology is not new; both Russia and the U.S. had MIRVs in the 1970s. However, China, in addition to Russia, now has MIRVed land-based ICBMs which represent a particular threat to both nuclear deterrence and defense systems. As an aggressor, MIRVs facilitate the destruction of multiple enemy targets with a single strike. Meanwhile, when in situ, the presence of multiple nuclear warheads on a single missile presents an attractive target that incentivizes a preemptive first strike. MIRVed ICBMs should be discouraged in arms control discussions.

Additionally, China is set to give its SLBMs MIRV capabilities. However, this is not comparably destabilizing. Not only is there precedent among the nuclear weapons powers, but also a submarine's concealed location significantly reduces the feasibility of a preemptive strike in spite of the increased attractiveness of MIRVed missiles as preemptive targets.

Finally, China is expected to roll out a Xian H-20 stealth bomber by 2025. Such a bomber is expected to have a range of 6,000 miles, comparable in its capabilities to the new U.S. B-21 Raider.[22] [23] [24]

Figure 1. Terrestrial-Based Detection of Ballistic Missiles vs. Hypersonic Weapons

Official CCP Policy & International Sceptics

Minimum Deterrence

Official CCP nuclear policy has centered on maintaining a "minimum deterrent" since its inception. The party has always maintained the purpose of its nuclear arsenal is to avoid "nuclear blackmail" from the U.S., and originally from the USSR.[25]

Zhao Lijian, CCP official and former Spokesperson for the Foreign Ministry, insists China continues to exercise the "utmost restraint" in its nuclear policy and that the arsenal remains "at the minimum level required by national security."

No First Use

These statements fall in line with China's continued commitment to a No First Use (NFU) policy. Declared at the announcement of China's first-ever nuclear bomb test, officials insist that NFU remains a guiding policy.

Additionally, China remains nominally committed to the non-use of nuclear weapons against non-nuclear-weapons states or in nuclear weapons-free zones.

In light of the hostile Cold War climate into which the Chinese nuclear arsenal was born, it is of little surprise that there has been perennial debate amongst U.S. officials as to the veracity of CCP claims over its nuclear intent; in particular its policy of No First Use.

U.S. concerns increased significantly following comments made in 1996. In the presence of the former Assistant Secretary of Defense, Charles Freeman, a PLA official declared the U.S. had lost its "strategic leverage" over the PRC because of China's second-strike capabilities. The official commented, "in the end you care more about Los Angeles than you do about Taipei," sparking speculation that the PRC may attack the island with the expectation of impunity.

The Department of Defense believes that the DF-41 and DF-5 missile capability of the new silo fields is indicative of a switch to a launch-on-warning (hair trigger) posture. Additionally, the department points to the launch of at least three early warning satellites that would facilitate the rapid launch of missiles before they were destroyed by an enemy attack.[26]

Treaty Obligations

China has been a party to the Nuclear Non-Proliferation Treaty (NPT) since 1968. However, in addition to questions surrounding China's involvement with the nuclear programs of North Korea, Pakistan, and Iran, international NGOs such as the International Campaign to Abolish Nuclear Weapons (ICAN) argue China's present weapons build-up is in violation of its NPT commitment to pursue a nuclear-free world. Under the terms of the treaty, states are prohibited from spreading nuclear technology to foreign states, committed to pursuing nuclear disarmament, and are obliged to accept IAEA supervision of their nuclear arsenal.[27]

Visit disarmament.unoda.org/wmd/nuclear/npt/ to find out more about the NPT.

The PRC played a central role in negotiating and signing the Comprehensive Test Ban Treaty. However, like the U.S. and Russia, it has yet to ratify the treaty and therefore does not consider itself legally bound by its terms.

Visit www.ctbto.org/our-mission/the-treaty to find out more about the Comprehensive Test Ban Treaty.

China, like all nuclear-armed states to date, has rejected the Treaty on the Prohibition of Nuclear Weapons (TPNW).

Visit psr.org/resources/zine-the-nuclear-ban/ to find out more about the TPNW.
Minimum Deterrence & Escalation Dominance

Although there has been no official move away from No First Use or minimum deterrence, the rapid growth of China’s nuclear arsenal is causing speculation over the future direction of CCP policy. To quote Hans Kristensen (Director, Federation of American Scientists); “It is increasingly difficult to square this trend with China’s declared aim of having only the minimum nuclear forces needed to maintain its national security.”[28]

Kristensen does note, however, that the international reliance on the U.S. Department of Defense for information on China’s arsenal must be treated with caution. For example, the forecast growth to 1,500 ICBMs by 2035 relies on assumptions regarding future force posture and The Pentagon’s assessment that the PLA “probably will” use fast-breeder reactors and processing facilities for its military program despite the CCP repeatedly making declarations to the contrary.[29]

Yet, it is of significant concern that the CCP has not declared an end goal to its escalation, has never publicly acknowledged the growth in its arsenal, and is not actively engaging in arms control discussions.

Increasing stockpiles of "tactical" nuclear weapons such as the DF-26 and growing policy discussions within China surrounding proportionate response in a limited nuclear exchange have increased speculation as to whether China is moving away from its historical posture, that all nuclear war is un-winnable, to a position increasingly reliant on establishing escalation dominance.

Active Defense

Overall, PLA military strategy is defined by the phrase "active defense." This is often referred to as the dialectic unity of restraining war and winning war. Restraining war includes "using war to stop war," i.e. striking first to win a swift victory and avoid a protracted conflict. Analysts fear this principle undermines the sincerity of No First Use.[30] Of concern here is the precedent set by Russia. President Putin has effectively used a nuclear shield to restrain the involvement of NATO powers in the war in Ukraine. "Tactical" nuclear weapons have thus entered the military playbook in a previously unseen manner. This troubling development, combined with a policy of active defense, raises the specter of nuclear conflict.
Second-Strike Capabilities

The principle of Mutually Assured Destruction (MAD), fundamental to the deterrence theory on which U.S. policy is based, relies on mutual second strike capabilities; to prevent an opportunistic strike nuclear forces must be able to withstand such an attack and retain destructive potential after the fact. In 1964, U.S. Defense Secretary Robert McNamara determined such destructive force to be set at the ability to destroy a quarter of a country's population and half its industrial capacity. These estimates determined the U.S. must retain 400 warheads after being attacked in order to maintain this capacity. From here the New START limit was set. This calculation holds in a two-state exchange and, according to game theorist Thomas Schelling, the shared capacity for destruction has created "a powerfully stable mutual deterrence."[31]

While China remains a distance away from matching Russian and American total stockpiles, if it achieves parity in active strategic forces - currently set at 1,550 warheads - it will raise significant questions over the viability of second strike capabilities.

In a scenario of three-state parity, it is not possible for each state to maintain second-strike ICBM capabilities against both rivals simultaneously.

Should Russia attack the U.S. and the U.S. carry out a second strike, the combined depletion of U.S. stockpiles would remove its second-strike capabilities - and therefore its land-based deterrence capacity - against China. In this scenario, a nuclear exchange between the U.S. and Russia leaves China as the nuclear monolith possessing potential coercive power over both. The same is true in any three-part exchange between states starting from a state of nuclear parity.

Note: this analysis only considers ground-based strategic deterrence.

A Red Queen's Arms Race

“Here, you see, it takes all the running you can do to stay in the same place." (Lewis Carroll, *Through the Looking Glass*) [32]

China's projected growth has led to calls for increased nuclear weapons capability and growth in the United States arsenal. Such escalation is folly and will result in a nuclear arms race in which the advantage is sought but is never achieved. As in the Red Queen Effect in evolutionary science, staying the same will be perceived as falling behind; adversaries will perpetually compete for comparative advantage and never rest.[33]

To achieve a guaranteed ICBM second-strike capability against both states, the U.S. would need to double its survivable force in case of a successful attack on U.S. soil, necessitating a doubling of its total strategic arsenal to achieve as much. Such a force would in turn undermine the survivability of Russia and China's existing peacetime arsenals. The two states would likely respond in kind and an escalatory cycle would begin.

Note: this analysis only considers ground-based strategic deterrence.
Assured Retaliation in a 3 State Scenario

Relative strategic weapons parity between three states undermines assured retaliation in the instance of a nuclear escalation from a two-state to a three-state scenario.

In this scenario, all states possess 3N nuclear warheads where N is taken to represent an arbitrary number and an attack of 1N is taken to carry the destructive power to destroy 1N of an adversary's stockpile.

Note: A 1N to 1N destructive ratio is used simply to demonstrate the broad dynamics of a nuclear exchange, not the exact force or impact of a nuclear strike. Modern ICBMs hold enormous destructive power whilst the existence of MIRVs facilitates both the targeting of multiple nuclear sites and the destruction of multiple warheads, with just one missile. In short, calculating the impact of one missile strike is complex, and 1N should be taken as an arbitrary measure, but the explanation remains usefully demonstrative of the second-strike problem between three comparably matched nuclear states.

The two-state exchange scenario forms the basis of the doctrine of MAD. However, in a three-state scenario, State C has retained its full nuclear capacity through non-involvement. Therefore, acting individually, if State A/B attacked State C they would not have sufficient firepower to negate State C's nuclear arsenal and they would leave themselves defenseless against further strikes. Alternatively, if they were attacked by State C their forces would be destroyed and they would be unable to retaliate with an ICBM missile.

An ICBM nuclear exchange between two comparably matched countries in a three-state nuclear world could thus leave the third state as the sole nuclear superpower.
Total Reliance on Nuclear Deterrence

In light of the instability caused by the three-state problem and the innovations of modern missile technology, the assumptions of nuclear deterrence theory have weakened. Increasing and modernizing the U.S. nuclear arsenal is not likely to reduce the threat of nuclear conflict. We are faced with an escalatory trap that cannot be simply resolved by militarism. To deal with the threats of the 21st century, U.S. policy must prioritize diplomatic engagement above military escalation.

Theorist Keith Payne describes a divide in U.S. deterrence thought between "easy" deterrence - those who believe the use of a nuclear weapon is self-evidently "folly" and thus deterrence is perennially stable - and "difficult" deterrence theorists - those who contend the maintenance of nuclear peace is "neither inevitable nor impossible" but requires "sustained intelligent effort."[34] [35]

The author of this report contends that passively relying on the stability of nuclear deterrence through its apparent self-evidence is insufficient. In light of the extraordinary aggression shown by President Vladimir Putin in Ukraine, and the importance of Taiwan to CCP policy, the possession of nuclear weapons should not be taken to effectively prevent great power conflict - such conflict could conceivably escalate into a nuclear exchange.

States are not self-evidently rational; they are complex human organizations with decision-making processes that can be impacted by organizational structures, biases, communication failures, and competing long-term priorities. Troublingly, given the prominence of military commanders in global strategic decision-making and the operation of nuclear weapons by military forces, the research of John Steinbruner indicates structural biases exist within military organizations that tend towards escalation above diplomacy during crisis situations.[36]

Additionally, renowned theorist Scott Sagan notes states act in ways often assumed irrational when they suffer from "goal displacement"; becoming willing to take exorbitant short-term risks to reach highly valued long-term goals. Leaders can become insensitive to the opinions of others and dismissive of barriers to their achievement. This position is entrenched further when the political cost of standing down rises. Henry Kissinger once noted that Egypt and Syria's launching of the 1973 Yom Kippur War did not fit U.S. security analysts' "definition of rational". Analysts had ruled out Egyptian aggression as such a war was "un-winnable", and served solely to "restore self-respect." Importantly, Kissinger noted; "There was no defense against our own preconceptions."[37] [38]

Security analysts must take caution to consider the role of bias, goal displacement, and irrationality when considering nuclear deterrence. It is folly to assume deterrence can be easily maintained through demonstrations of force in lieu of responsible checks on military practice, command structure, escalation dynamics, and international diplomacy.

Brinkmanship in Taiwan

Strategic competition in the Taiwan Strait must be delicately managed. The cost of war rises with each of the military developments here discussed, and with both states taking highly combative postures the risk of nuclear escalation is troubling.

To quote Steinbruner; "it is quite apparent [...] that the preservation of a strong deterrent effect and the actual prevention of war are not the same thing."[39]

With both states increasingly entrenched in their views - with China accused of pursuing a "revisionist foreign policy" and America accused of being the "principal instigator" of international instability through its exclusivist "hegemon mindset," - the dangers of goal displacement come into clear focus.[40]
Hawkish rhetoric should be discouraged, and investment in direct channels of conflict de-escalation must be made.

Critical to the resolution of the Cuban Missile Crisis was the relative ease of communication with Soviet high command - no such channels exist with China at present. This situation must be altered as a priority. U.S. officials must leverage potential communications with the CCP over the conflict in Ukraine to lay the foundations for long-standing conflict resolution mechanisms.

The author agrees with the conclusion of The Task Force on U.S.-China Policy that neither state desires active conflict with the other, least of all a nuclear exchange. However, given the lack of crisis communications, or experience between the two countries in significant crisis management, an accidental nuclear exchange - or rather an undesired nuclear exchange caused by miscommunication or misunderstanding - is a troubling possibility. Both governments must avoid incendiary steps that force the other side into conflict.[41]

With regard to Taiwan, this means a commitment to the peaceful continuation of the historic status quo. It has already been shown that military exercises and nuclear posturing have not yielded any result other than increasing the chance of devastating conflict.

Put simply, effective deterrence and the reduction of tensions in Sino-American relations require a significant reduction of mutual threats and a greater emphasis on mutual assurances.

Michael Swaine, of the Quincy Institute, asserts there is no viable alternative to the One China Policy. His conclusion is hard to dismiss. The U.S. position asserted in the Shanghai Communique (1972) "that there is one China and Taiwan is part of China," reasserted by Secretary Blinken in June 2023, is the only one that avoids a direct Sino-American war.

While it is vital to defend the democratic interests of the Taiwanese people, the current U.S. view of Taiwan as a crucial global strategic hub is in direct contradiction to the CCP's interests and will continue to stoke tension.

In the Asia-Pacific region more broadly, it must be acknowledged that the U.S. cannot realistically contain China in the region nor can China exclude the U.S. from the Asia Pacific.

**Operational Alert**

In light of the risk of either accidental or undesired nuclear conflict, the lack of transparency over China's rumored switch to a Launch-on-Warning (also known as hair-trigger) status and its High Operational Alert practices are of concern.

A state of high operational alert describes a situation in which nuclear warheads are pre-fitted to missiles or held at airbases that host nuclear bombers. Between Russia and the United States, there are some 900 missiles on hair-trigger alert while the PLA Rocket Force conducts monthly high alert drills - with missiles placed in ready-to-launch and standby positions.

The international community should seek clarity over these operations, particularly over the length of time for which this level of alert is maintained, and the chain of command for launch.

Hair-trigger alert postures increase nuclear risk at little gain to deterrence and should be discouraged. The U.S., Russia and the PRC would be advised to reduce the number of missiles on high operational alert, separating warheads from launch sites where possible and reduce the chance of nuclear disaster. Mutual insecurity drives both sides towards conflict.

U.S. officials, including former CIA and NSA directors, President Obama and President Bush have described “hair-trigger” as an “absolutely insane” relic of the Cold War that, according to Obama, “increases the risk of catastrophic accidents or miscalculations.”[42]

Given the seeming impasse on arms negotiations, and the Pentagon’s concern over a potential switch in Chinese force structure to include “hair trigger” status, this is an opportune moment for the U.S. to reconsider its dangerous nuclear posture and place the unilateral removal of “hair trigger” on the negotiation table in order to improve the safety of citizens in both countries and across the world in light of developing geopolitical tensions.
The Five Incapables

Chinese media often expresses concern over the operational inexperience of the PLA. Chinese troops have not fought a conventional war since their brief involvement in the Korean War (1950-53). Consequently, some outlets speak of the Five Incapables in reference to operational and command issues. Most troubling in the nuclear context is a recognized inability to understand a higher authority's intentions; make effective operational decisions; and manage unexpected situations.

Such concerns grew in August 2023 after Xi Jinping abruptly replaced the PLA Rocket Force's top two commanders with political allies that have no previous experience managing nuclear weapons.

The changes came amidst a South China Morning Post report that claimed anti-corruption investigators were investigating the now-ousted General Li Yuchao and his deputies. Analysts have speculated that corruption surrounding silo development contracts may be at the root of such upheaval. The replacement of the existing hierarchy with outsiders, rather than PLA Rocket Force deputies, suggests a deep mistrust between CCP leadership and those in charge of the nuclear arsenal. This is highly concerning.

Steinbruner contends; "the most serious threat of war under current circumstances probably lies in the possibility that organizationally and technically complex military operations might override coherent policy decisions and produce a war that was not intended." His conclusions are troubling in the Chinese context.

In a potential nuclear crisis, the lines of communication are likely strained - or, in the case of nuclear submarines, become unusable - operational decisions would therefore fall to commanders in the field. It is thus critical that China address existing command and communication structures and ensure that nuclear decision-making lies firmly in civilian hands with adequate checks and protections on the possibility of miscommunication and malpractice.

Artificial Intelligence

China's drive to integrate contemporary technological innovations into a forward-looking military infrastructure raises critical questions as to the role of AI in the nuclear debate.

At present, there are neither international norms on the utilization of AI in combat situations nor an international treaty to govern the relationship between AI and nuclear weapons. It is vital that AI systems are entirely separated from the launch capacity and decision-making processes involved in the nuclear equation.

Amidst the wide-ranging debates on strategic stability, deterrence, and great power conflict, it is easy to lose sight of a critical truth: nuclear weapons control is a humanitarian issue. Nuclear weapons kill brutally and kill indiscriminately. An exchange of just 1% of the world's present nuclear arsenal could cause a nuclear famine impacting two billion people.

The future of humanity must not be intertwined with the development of a technology that, at present, is unregulated and poorly understood.

It is a welcome development that the U.S. Department of State has publicly stated their commitment to the non-involvement of AI systems in U.S. launch protocols. While the State Department recognizes AI will inevitably be utilized in military scenarios their affirmation that "states should maintain human control and involvement for all actions informing and executing sovereign decisions concerning nuclear weapons employment."[46]

AI is a critical area of common interest between all nuclear weapons states. It is once again urged that the United States leverage any possible areas of cooperation in order to bring nuclear weapons states to the negotiation table. Direct communication between adversarial states is a vital prerequisite if future nuclear crises are to be avoided. It is absolutely in the mutual interest of states to set clear legal barriers to AI involvement in nuclear weapons deployment. Such an opportunity for cooperation is rare and must be utilized.
Opacity & a Lack of Multilateralism

At present the endpoint and intentions of the PRC nuclear build-up are opaque. The estimate used here that China will possess approximately 1,500 nuclear weapons is based on assumptions because the CCP has not acknowledged nuclear growth nor outlined its plans. This uncertainty breeds instability, it is already fueling anti-China rhetoric in the United States.

China's refusal to report its fissile material stockpiles to the IAEA similarly raises global threat perceptions and runs counter to the interests of stability and peace.

The author of this report welcomes the language of the 2022 U.S. Nuclear Posture Review in stating; "mutual, verifiable nuclear arms control offers the most effective, durable and responsible path to reduce the role of nuclear weapons in our strategy and prevent their use" and its nod to the need for "additional discussions of mutual restraints in capabilities and behaviors."

As a priority, the international community must press for mutual verifiable arms control in a manner comparable to that of New START. A hard ceiling on nuclear armament could help prevent a cyclical and un-winnable arms race; a clear policy in the South China Sea could deter the deployment of "tactical" nuclear weapons or the use of a nuclear shield to facilitate aggression, and; international norms and laws on the use of emerging technologies could provide strategic clarity and in turn reduce international tensions.

U.S. officials and policy reports insist the Biden Administration remains open to arms control talks with the CCP but that Chinese officials are unwilling to come to the table. Yet, with the CCP having repeatedly stated their willingness to discuss a fissile material cut-off treaty and their desire to see the U.S. switch to a policy of No First Use it is incorrect to claim that there are not significant avenues for future deliberation. In this state of rising global tension, both sides must demonstrate a willingness to place previously held positions on the table in order to achieve progress.[47]

As Ukrainian President Volodymyr Zelenskyy reminded UN delegates in 2022: “None of you will find a cure for radiation sickness.” A nuclear strike on one country threatens the future of all nations. There is no cure for radiation sickness, and there will be no adequate humanitarian response available during a nuclear war.[48]

It is in every nation’s mutual interest to ensure that nuclear weapons are never again used. While diplomats may doubt the sincerity of their foreign counterparts, multilateral cooperation is the only means to reduce the unacceptable nuclear threat that currently looms over us all.
Conclusion

The growth, opacity, and future direction of China's nuclear policy constitute a significant and worsening development to the already unacceptable threat nuclear weapons pose to humanity. The CCP's drive to obtain comprehensive status as a global nuclear superpower appears rooted in a century-long struggle to restore the prestige and strength of the PRC whilst ignoring the global impacts of a potential Sino-American conflict. Mutual brinkmanship in the Taiwan Strait represents a significant challenge to the maintenance of the nuclear taboo as two nuclear superpowers edge closer to war.

Yet, the problem is not simply one of CCP ambition and Chinese militarism. The existing nuclear superpowers have paid little more than lip service to the non-proliferation and arms control regimes since the turn of the century. The PRC, already an economic and military superpower, is competing in an international environment whereby great power status has continually been defined by nuclear strength. The international community has failed to incentivize restraint from China's military planners. It is worth remembering that the Russian and American nuclear arsenals remain more than ten times larger than that of the PRC, while the American military budget rises toward a trillion dollars a year.

Great power competition is couched in terms of strategic advantage and military theory, yet human lives are at the center of these conflicts. There are no victors in a nuclear war. There is only catastrophic humanitarian disaster.

This is why there is a global movement to affirm the prescriptions of the TPNW. 122 states recognize that the primary victims of nuclear weapons are innocent civilians, that any nuclear weapons use would have devastating environmental and humanitarian consequences, and that, therefore, their production and use are unacceptable under all circumstances. The nuclear weapons states thus act as pariahs, sidelining the interests of governments worldwide for their own perceived gain.

With the nuclear states moving in the wrong direction, the international community must immediately prioritize any viable measure to increase the strength of multilateral arms control, nuclear transparency, and nuclear security. This should include, but not be limited to, serious considerations of the CCP’s proposals for a fissile material cut-off treaty, mutual commitments to policies of No First Use, legal constraints to the operational limits of artificial intelligence within the military, and a move away from “hair trigger” statuses. Any one of these proposals would considerably reduce the nuclear threat while their negotiation has the potential to develop goodwill and collaborative experience that is currently concerning in its absence.

From the U.S. perspective, the author of this report suggests policymakers embrace a framework of "competitive interdependence". This framework recognizes the reality of continued strategic competition between the U.S. and the PRC while clearly establishing that conflict, however limited, is against the economic and humanitarian interests of both states. It prioritizes the setting of "red lines," standards of diplomacy, and mutual transparency on matters of global significance.[41]

The continuation of the nuclear taboo cannot be languidly assumed. Nuclear peace is precarious, and with the advancement of technology and the emergence of a third nuclear superpower, it has become increasingly so in the last decade. We stand at the precipice of a nuclear arms race and an unchartered array of strategic risks. It is time to step away and incentivize multilateral cooperation.
Notes


[10] Ibid.


[16] 2023 Annual Report to Congress


[20] Ibid.

[21] Ibid.


[23] "Fact Sheet: China's Nuclear Inventory", Arms Control Center.


[26] 2023 Annual Report to Congress


2023 Annual Report to Congress
[30] Ibid.


[38] H. Kissinger, *Years of Upheaval* (Boston, 1982).

[39] Steinbruner, "National Security and the Concept of Strategic Stability"


[44] Steinbruner, "National Security and the Concept of Strategic Stability"


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