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Nuclear Weapons and China's National Security: Consistency, Evolvement and Risk Management

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ABSTRACT

This paper examines the evolving role of nuclear weapons in China's national security policy, emphasizing the interplay between consistency, adaptation and nuclear risks amidst changing global dynamics. Since its first nuclear test in 1964 and despite geopolitical changes later on, China has maintained that its nuclear weapons serve defensive purposes. However, China's evolving threat perceptions shaped by security incidents, regional proliferation and policy shifts of other nuclear weapon states have influenced debates over the approach of its nuclear modernization, likely culminating in a significant acceleration of China's strategic capabilities. This paper also delves into the dynamics of China–US strategic stability, highlighting the risks of nuclear escalation, inadvertent conflicts and arms races. The analysis underscores the lack of substantive China–US nuclear dialogues, the persistence of mutual misperceptions and the need for effective risk reduction mechanisms. Concluding with recommendations, the paper advocates for enhanced transparency, sustained arms control discussions, reaffirmation of China's commitments and the development of crisis prevention and management frameworks to mitigate nuclear risks in Northeast Asia and beyond.

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The Role of Nuclear Weapons in China

Consistency in an Evolving Security Environment

Announcing the first nuclear test on 16 October 1964, Xinhua News Agency published an official statement by the Chinese government that outlined the role of nuclear weapons in China: to defend itself and oppose the nuclear blackmail and threat by American imperialism. The no-first-use (NFU) policy was also pledged at the same time.

In 1964, the designation of the role of nuclear weapons is believed to be based on China's security environment at the time as well as its experience with nuclear blackmail. After US President Truman stated that the use of nuclear weapons was considered to stop Chinese soldiers in the Korean War in November 1950, the Eisenhower administration's threat to use nuclear weapons to end the Korean War in May 1953 and the judgement of Chairman Mao that a Khrushchev-proposed Soviet nuclear umbrella was not

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trustworthy, the Chinese government decided to develop its own nuclear industry in January 1955 (Norris and Kristensen 2006; Sun 2014; Wang 2012). This decision, according to leading experts in China, did not contradict Chairman Mao's famous contempt for nuclear weapons. It is true that Chairman Mao described such weapons as "paper tiger" on a strategic level, but he also recognized their tactical functions especially when the aggressors own a monopoly on the weapon (Sun 2014; Wang 2012).

Approaching the end of the Cold War, the security environment of China improved significantly, but the role of nuclear weapons in China did not change, according to its multiple Defense White Papers up to 2019 as well as the leading Chinese scholars.[1] This may be mainly for two reasons. First, nuclear weapons are essentially designed for extreme scenarios and changes in the geopolitical landscape do not significantly affect their fundamental roles. Second, Beijing's threat perception continues to be shaped by several factors, including the policy evolvement of major nuclear weapon states (NWS), regional nuclear proliferation and conventional-level incidents relevant to China's national security.

On the conventional-level, throughout the 1990s and the early 2000s, the Yinhe incident, the US intervention in the 1996 Taiwan Strait Crisis, the US bombing of the Chinese embassy in Belgrade and the Hainan Island incident took place one after the other, creating a sense of insecurity for China.[2]

On the nuclear and strategic level, China faces two types of security challenges: regression of the nuclear policies of NWS and regional nuclear proliferation. Regarding the former, after the collapse of the Soviet Union, Russia almost immediately (in 1993) reversed the NFU policy once declared by the Soviet Union. The post-Cold War US administrations did not choose to accept anything similar to NFU policy either. The George W. Bush administration went a step further to withdraw from the Anti-Ballistic Missile Treaty (ABM) and reportedly had the potential to lower the threshold of nuclear use in its 2002 Nuclear Posture Review (Ferguson 2002).

China's threat perception was likely sharpened by such policy actions in the nuclear and strategic domain. On Russia's reversal of NFU policy, though Beijing's public critics cannot be found, China proposed the "Draft Treaty on No-First Use of Nuclear Weapons" in 1994 to encourage other NWS to follow suit and, in the same year, signed a joint statement with Russia on mutual NFU and de-targeting of strategic weapons, implying Beijing's concern about the latest development. Regarding the US actions, not only did Beijing emphasize that the US withdrawal from the ABM treaty would bring "the most significant negative consequences" but the Chinese academic community also argued that China may take countermeasures to ensure its nuclear deterrence at a time when US missile defense systems reduce the credibility of China's deterrence (Guo 2002; Ministry of Foreign Affairs of the People's Republic of China 2000).

[1]Between 1998 and 2010, the Chinese government published Defense White Papers every two years, and in the 2010s three times, with the latest version published in 2019. Throughout these White Papers, the role of China's nuclear weapons is described as deterring other countries' use or threat to use nuclear weapons and self-defense in nature. For scholars' comments, see Fan (2018) and Sun (2021).

[2]Yinhe incident: in 1993, a Chinese container ship, Yinhe, was forced to be inspected by the United States for suspicion of carrying chemical weapon materials to Iran, but later proved innocent. Hainan Island incident: in 2001, a mid-air collision between a US intelligence aircraft and a Chinese interceptor aircraft near Hainan island took place, leading to the loss of one Chinese pilot.

At the same time, the United States has also been improving its damage limitation capabilities vis-a-vis China. Renowned Chinese scholars believe that the US long-term investment in the past two decades in damage limitation capabilities – especially in homeland missile defense, anti-submarine warfare and space-based ground moving target indicator – has put serious pressure on China's nuclear retaliatory capabilities and caused deep concerns in Beijing (Li and Wu 2024).

Regarding the latter strategic challenge – regional nuclear proliferation – in the post-Cold War era, three of China's land neighbors continued rejecting abiding by the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and insisted on developing their indigenous nuclear forces. The growing nuclear capabilities of India, Pakistan and the DPRK and their unstable relations with their security rivals and threats worry Beijing.

Collectively, these nuclear developments and conventional incidents likely enforced China's perception that its security environment is far from carefree and its assessment that nuclear weapons still play an unchanged role in safeguarding China's national security. That said, it should be noted that although Beijing's evolving threat perception does not necessarily change the role of nuclear weapons in China, it does impact the debates within China's policy circle and likely the pace or approach of China's nuclear modernization.

In the early 2000s when China–US relations were stable and China felt less threatened, for instance, against the backdrop of the US withdrawal from the ABM treaty, debates over whether and how China should continue building up its nuclear forces were heated among Chinese scholars. One school of thought argued for extreme self-restraint, and the other refuted the idea.[3] Approaching the 2020s, as China–US relations entered a free-fall – global geopolitics filled with tensions and China's threat perception surged – such debates have ceased to exist, with only arguments for increasing China's nuclear forces audible. This trend is accompanied by the transition from a slowly, incrementally increased Chinese arsenal to a widely believed accelerated nuclear build-up in pursuit of "a strong system of strategic deterrence" as stated in the report to the 20th National Congress of the Communist Party of China.

Can We Observe the Consistency?

Back in 1964, the concrete language announced on the day of China's first nuclear test – "countering American imperialism" – was apparently shaped by the political environment back then. Sixty years later, when leading Chinese experts describe the role of nuclear weapons in China, "American imperialism" is replaced with "overseas military threats", but the core element remains self-defense, preventing nuclear blackmail and deterring nuclear attack (Li 2023; Sun 2021, 135). In addition to how Chinese experts judge it to be, this consistency can also be observed from the Chinese government's unilateral declaratory policies, its actions in the multilateral fora, as well as its attitude toward technologies that are prone to first strike.

[3]For instance, Shi Yinhong, a leading scholar on international relations at the then PLA Academy of International Relations, argued in 2000 that facing a US build-up of its national missile defense, China should let the United States be and refrain from a massive increase in China's retaliation capabilities. In the following years, multiple scholars debated with Shi on China's countermeasures. See Shi (2000), Zhang (2002), and Wu (2003).

On the declaratory policy level, Beijing has a proven record of keeping its NFU and negative security assurance (NSA) commitments. It has never employed nuclear threats or signals in any of its conflicts or disputes with other countries. Responding to ongoing wars in other regions of the world, such as in Ukraine, China is also particularly vocal and effective in opposing the use and threat of the use of nuclear weapons. This is not only demonstrated by official statements from Beijing on the war in Ukraine but also confirmed by the former US Secretary of State Anthony Blinken before his departure (Sevastopulo 2025).

These stances are also accompanied by China's actions on multilateral fora. In the NPT mechanism, for instance, China proposed a P5-wide treaty or political statement on mutual NFU and called for an international legal instrument on providing NSA to non-nuclear-weapon states (NNWS) and nuclear-weapon-free-zones in the Second Session of the Preparatory Committee for the 2026 NPT Review Conference. Under the P5 mechanism, China also pushed hard to materialize the 2022 P5 joint statement on preventing nuclear war, making extra efforts to add language such as "a nuclear war cannot be won and must never be fought" and the reaffirmation that none of the nuclear weapons are targeted at each other or at any other state (Cheng 2022). Pledging these commitments unilaterally and advocating for them multilaterally at the same time, Beijing has tied itself tight with these brands and increased its own cost of deviating from the path.

China's attitude toward first-strike capabilities, though not as publicly available, can be reflected by key figures' remarks and the focus of the Chinese academia in the nuclear domain. Zhu Guangya, one of the founding fathers of China's nuclear weapons program and later a top leader in the Chinese political system, stated that there is little distinction in strike effect between tactical and strategic nuclear weapons, indicating that nuclear weapons eventually only have strategic roles (Sun 2021, 98). This view is believed to be widely shared by most top leaders and nuclear scientists in China (98). As a result, in Chinese academia, there is a general lack of research on the tactical use or deployment of nuclear weapons even after academic freedom significantly grew in China after the 1980s, which is in contrast with that of the United States. In a similar vein, the ongoing shockwave experienced by the international community since the discovery of China's new silos in the summer of 2021 focuses primarily on Beijing's intercontinental ballistic missiles (ICBMs) and strategic weapons, not tactical or low-yield nuclear weapons (Kristensen et al. 2024).

Nuclear Risks Between China and the United States

As the biggest security concern of China is the United States, this section addresses primarily nuclear risks in China–US dynamics. Risks associated with errors, especially those that are not man-made, such as technical failure, will not be discussed here.

Overarching Challenges

Overall, many of China-US nuclear risks are sourced from the lack of substantive China–US dialogues on this topic. Before delving into the concrete risks, two overarching challenges should be introduced first as they significantly reduce Beijing's motivation and enthusiasm to engage in China–US risk reduction exchanges.

The first regards the impact of the 1999 Cox Committee Report – a US congressional document alleging that China acquired sensitive American military and nuclear technology through espionage and threatened US national security. Between 1995 and 1998, the United States and China conducted a lab-to-lab technical exchange program (also known as US–China Arms Control Technical Exchange) involving Sandia National Laboratories, Lawrence Livermore National Laboratory, Los Alamos National Laboratory and their counterparts in China. A US initiative, the program aimed at improving contacts with China in the area of arms control verification, nuclear materials protection and nonproliferation (Johnston et al. 1999, 15). After the Cox Report, however, many relevant meetings and activities were canceled, leading to the end of the lab-to-lab exchange. Although the Cox Report is widely criticized by both the United States and Chinese policy communities as inflammatory and poorly supported, and China made it clear that as long as the United States could agree that the lab-to-lab program was legal and mutually beneficial, China expressed willingness to restart the program, the United States has been reluctant to agree to it (H. Zhang 2016, 30). To date, the impact of the Cox Report continues to loom large in the field of China–US scientific exchange as well as their nuclear dialogues (Li 2008).

The second overarching challenge concerns China–US disputes over the framework of discussing risks. Beijing usually emphasizes the "root cause" of risks and prefers discussing risk prevention, whereas Washington emphasizes the technical aspects of certain scenarios and prefers addressing risk management. To quote some Chinese experts, addressing US emphasis is similar to putting a seat belt on the United States so that the United States could feel safer conducting reckless activities against China (Hu 2021).[4] Therefore, there has been a general lack of interest for China in discussing risk reduction with the United States. This is also the case in China–US exchanges on conventional-level crisis management, such as maritime and mid-air crisis management.

Risks Associated with Lowered Strategic Stability

Under the most commonly accepted framework, assessing China–US nuclear risks is equal to assessing China–US strategic stability. This section of the paper takes the classic definition of strategic stability – a combination of crisis stability (when neither state has the incentive to use nuclear weapons first in a crisis) and arms race stability (when neither state has the incentive to engage in an arms race) – and examines the risks of nuclear escalation and arms race between China and the United States from both technical and political aspects.

Risk of Nuclear Escalation (Crisis Stability)

In crises, nuclear escalation could be either deliberate or inadvertent. Historically, the deliberate escalation risks between China and the United States were low. The underlining logic is that China had little intention to strike first given its small arsenal and NFU policy, and since China had a minimum deterrent that, depending on experts' views, either meant secured second strike capabilities or first-strike uncertainty, the United

[4]These sentiments were also expressed at a track-2 US–China dialogue in Beijing, July 2019.

States was unlikely to strike first either.[5] Conventionally, the United States was also much stronger than China, making the likelihood of nuclear use even smaller.

In recent years, however, deliberate escalation risks seem to have increased. Due to the increased discussions in Washington on nuclear use in Taiwan Strait scenarios, increased discussions on nuclear sharing with its Asian allies, the US tendency to deploy more nuclear warheads – including in the Asia-Pacific region – and the perceived US lowering of the nuclear threshold as indicated in its nuclear doctrines, there has been increased anxiety in China about its security environment and concern about US nuclear use. On the other side, due to the perceived acceleration of China's nuclear expansion – both in terms of number, type and qualities – the United States has been seriously reevaluating China's intention and incentive to use nuclear weapons first.

Regarding the inadvertent escalation, Wu Riqiang thoroughly categorized three models under the China–US framework: "use it or lose it" mode, unauthorized/accidental mode and the damage limitation mode (Wu 2022, Chapter 5). The first model predicts that the United States could inadvertently attack Chinese nuclear forces due to the conventional-nuclear entanglement of certain Chinese weapon systems. Chinese leadership could perceive such attacks as deliberately disarming Chinese nuclear forces, thus pressuring Beijing to either use it or lose it. The second model refers to two scenarios: (1) due to the concern about the survivability of its Nuclear Command, Control and Communications (NC3) systems, China could pre-authorize theater-level commanders to use nuclear weapons. In a crisis, commanders could decide to use such weapons based on incomplete or inaccurate information. (2) If China adopts a launch-on-warning (LOW) posture, a false alert could trigger the inadvertent escalation. The third model predicts that, in a crisis, due to the increased damage limitation capabilities of the United States, China's worry about US nuclear disarming blackmail and China's concern about the survivability of its nuclear arsenal, Beijing could increase its alert level and conduct counter-blackmail operations through means, such as mobilizing its forces and launching exercises, leading to Washington's misperception of Beijing's signal and triggering US damage limitation strikes.

From a Chinese perspective, risks for inadvertent escalation under the three models have been reduced rather than increased given the recent development. With the growth of the Chinese arsenal, Beijing worries less about its nuclear forces being disarmed by Washington, thus reducing the likelihood of the first model and the third model. Regarding the second model, Chinese experts believe that Beijing is less likely to adopt a LOW posture because only when a country has a very small arsenal, and thus insecure retaliation capabilities, would it be prone to adopt LOW. Now that China has a bigger arsenal than before, there should be less desire to shift to LOW.[6] As for China's NC3, Wu Riqiang argues that NC3 is highly centralized in China and focused on preventing launches by mistakes rather than ensuring launches.

However, this Chinese perspective is unlikely to be shared by the United States. Given risks are driven by the perceptions of both sides and the US perception of China's build-up is quite different (the issue of misperception will be discussed later in the paper), one could argue that risks for inadvertent escalation still loom large.

[5]For details of first-strike uncertainty, see Wu (2013).
[6]From a track-2 US–China dialogue in Shanghai, March 2024.

Risk of Arms Race

The risk of a nuclear arms race seems more imminent than that of nuclear escalation of conflict. In a non-strict term, the prelude of an arms race has already been completed. China is perceived to have speeded up its nuclear build-up, growing from 410 warheads in January 2023 to 500 in January 2024 as estimated by SIPRI, and one does not need to repeat the Pentagon-projected number of 1000 by 2030 (Stockholm International Peace Research Institute 2024; U.S. Department of Defense (2024a, 101). From the side of the United States, senior US officials have publicly indicated a future of US increase in the number of deployed warheads, and according to the latest US Nuclear Employment Strategy, current US force capability, posture, composition and size may all be adapted (Arms Control Association 2024; U.S. Department of Defense 2024b). Prominent US experts from both sides of the aisle have also reached a consensus on China's nuclear threat, as is indicated in the Final Report of the Congressional Commission on the Strategic Posture of the United States. These experts advise the United States to urgently modify its theater nuclear force posture by providing nuclear response options and deploying theater nuclear forces in the Asia-Pacific region (Creedon et al. 2023, viii).

From the official Chinese stance, Beijing has insisted that it has no intention of pursuing nuclear arms control and argues that it "has always kept its nuclear force at the minimum level required for national security" (Ministry of Foreign Affairs of the People's Republic of China 2024b). However, an arms race is a two-way strait. In reality, how the other side reacts significantly affects the dynamic. There have been several measures both sides could have taken in the past decades to prevent an arms race, such as the United States recognizing mutual vulnerability with China and limiting its missile defense systems, China increasing its transparency and engaging in regular military-to-military nuclear dialogue, but unfortunately, none of these measures was taken seriously. Meanwhile, the risks – both of an arms race and escalation – are hugely exacerbated by misperception and miscalculation between the two countries against the backdrop of deteriorated bilateral relations and heightened geopolitics.

Misperception and Miscalculation

Misperception and miscalculation have become a regular theme for China–US relations, especially in the nuclear domain. For instance, in Washington, a widely accepted narrative is that China aims to become a nuclear peer to the United States by 2030 or 2035. In the views of leading Chinese experts, however, ensuring Beijing's second strike capabilities are the ultimate goal of the current development in the Chinese arsenal: in the past, when Beijing only incrementally increased its arsenal to enhance the survivability level of its arsenal, Washington was always able to counteract it with its counterforce capabilities, so the current perceived "leap forward" is a way to ensure the survivability of Beijing's arsenal once and for all.[7] In addition, even if China reaches 1000 by 2030 or 1500 by 2035 – which is unlikely given China's fissile material stockpile – the only difference will still be the number of survivable Chinese warheads, and China will still be unable to disarm US nuclear forces.[8] Future moves based on this misperception will likely

[7]From a track-2 US–China dialogue in Shanghai, March 2024.
[8]Ibid.

cause more miscalculations on both sides, exacerbating risks of nuclear escalation and arms race.

Other Factors: Risks Associated with Third Parties in the Asia-Pacific and Emerging Technology

In China–US nuclear dynamics, risks associated with third parties in the Asia-Pacific cannot be overlooked. These risks refer primarily to Taiwan Strait scenarios, contingencies involving parties around the Korean Peninsula, as well as extreme scenarios involving other US treaty allies in the region, such as the Philippines. Emerging technology is another factor that should be thoroughly studied. Given that many of the risks remain highly speculative, this paper does not aim at providing detailed elaboration but will only point out the core issues.

In scenarios related to Taiwan, the United States has held many discussions on the relevant nuclear risks. Prominent think tanks, experts and former US officials such as RAND, CSIS, Gregory Weaver, Matthew Kroenig and Elbridge Colby[9] have either argued that China would use nuclear weapons first in a desperate effort to prevent its defeat or the United States would use nuclear weapons first given the increasing Chinese conventional advantage in the region, or nuclear escalation would take place inadvertently (Colby 2014; Goldfeld et al. 2024; Kroenig 2023; Weaver 2023). The consensus is clear: nuclear risks are unavoidable if the United States is committed to fighting and winning a war with China over Taiwan Strait contingencies and managing such risks is challenging. To date, there have been few publicly available academic or policy discussions in China on the same topic, likely due to the sensitivity of the issue, the lack of accessible material or data, as well as the preference for prevention over management when it comes to nuclear risks or any risk. That said, two types of Chinese reactions to US discussions are visible: one denies the risks from rising from the Chinese side, arguing that China's nuclear use is unthinkable as Beijing emphasizes the peaceful reunification of Taiwan and sees Taiwan people as compatriots (tóng bāo) (Zhou 2024). The other type recognizes and assesses such risks, arguing that the United States is more prone to start a nuclear war because Washington has fewer escalation options in terms of targets, whereas Beijing could launch conventional strikes against US military facilities in Guam or Hawaii (Liao 2023).

On the Korean Peninsula, multiple factors are increasing nuclear risks. These include the potential upgrade of the US nuclear umbrella to Japan and the ROK, the ROK's quest for its own nuclear weapons, provocations and involvement of the DPRK in European security triggering NATO responses, and the US-perceived growing Russia–China–DPRK–Iran collaboration and collusion in crises and conflicts, among others (U.S. Department of Defense 2024b).

Regarding the Philippines, nuclear risks are mostly argued by Filipino officials, referring to Chinese activities in the South China Sea and the Mutual Defense Treaty between the Philippines and the United States (Sevastopulo 2024). Chinese experts did not take this argument as seriously given the low likelihood of the United States going

[9]As of January 2025, Elbridge Colby has been nominated for a senior position at the Department of Defense again.

nuclear for a few rocks in the South China Sea, regarding it merely as a rhetorical campaign to play up the China threat (Fan 2024).

In terms of risks associated with emerging technologies, the two governments seem to have taken it more seriously. Taking AI for instance, after years of track-2 discussion in the policy communities on regulating AI-related risks, a president-level affirmation on the need to address such risks in 2023 and track-1 talks on AI risk and safety in Geneva in May 2024, President Xi and President Biden reached a consensus on maintaining human control over the decision to use nuclear weapons in November 2024 (U.S. Mission to International Organizations in Geneva 2024; Ministry of Foreign Affairs of the People's Republic of China 2024a). That said, whether the verbal consensus could be implemented or at least stay intact in the second Trump administration remains to be seen. In several other domains related to nuclear risks, including outer space, hypersonic systems and cybersecurity, the lack of progress remains.

To sum up, the risks identified above vary in level: some are more imminent, some are more speculative and some involve many actors, making the assessment of the risk complicated. Despite their differences, all of these risks require better crisis communication channels and management mechanisms between China and the United States, which are currently far from sufficient.

Tackling Risk Reduction: What is Needed in Northeast Asia and Beyond

Compared with conventional-level crisis management between China and the United States, which has at least materialized into a few official agreements including the 1998 Military Maritime Consultative Agreement (MMCA) and two 2014 Memorandum of Understanding (MoUs) (on Notification of Major Military Activities and Confidence-Building Measures Mechanism; on the Rules of Behavior for Safety of Air and Maritime Encounters), in the nuclear and strategic domain, such mechanisms are lacking. But what type of mechanisms are needed, and how to get there? This section of the paper tries to propose several recommendations based on historical best practices in other regions and lessons learned from the track-2 discussions – both in conventional and nuclear domains – that the author attended over the past 6 years. The paper proposes recommendations for China, bearing in mind that certain measures should also be proposed to and taken by the United States.

Resolve China–US "Framework" Issue and Sustain Talks on Mechanisms

Conceptual Clarification

As previously mentioned, disputes over the "framework" of discussing risks are one of the overarching obstacles to substantive and sustainable China–US engagement in this domain. So far, China has strongly preferred to discuss crisis prevention, whereas the United States has focused on crisis communication and management.

One way to break this stalemate is to make clear what each framework entails in terms of substantive topics. It is possible that after making it clear, there will be overlaps between what each of the two prefers. For instance, under the prevention category preferred by China, topics could include policies and doctrines elaboration, as elaborating them could reduce misperception in the first place, therefore preventing crises. Both

China and the United States are comfortable discussing them. Another topic under the prevention category could be restrictions on certain weapon systems in certain locations, as such restrictions could reduce miscalculation from the onset. China could be interested in discussing US ground-based INF-range missiles in the Asia-Pacific, and for the United States, potential arrangements on Chinese INF-range missiles are also of interest. Precautionary measures should also fall into the prevention category as they generally reduce misperception and miscalculation. One area of potential is pre-launch notification. The United States has a long-standing practice of doing so with Russia and through multilateral mechanisms such as the Hague Code of Conduct (HCOC). Although China did not join HCOC or the similar US-proposed mechanism, this might change in the future as China, for the first time, notified the United States and several other countries in a targeted approach in September 2024 before its latest ICBM test. Other precautionary measures such as pre-deployment and pre-drill notification with the United States may draw China's interest. The 2014 MoUs already covered this issue generically, though on a purely voluntary basis, but it did not define what "major military activities" were and did not mention nuclear forces. In several track-2 dialogues on China–US maritime crisis management, when addressing risks brought by US Freedom of Navigation Operations (FONOPs) in the Chinese periphery, several Chinese experts proposed that while China did not expect the United States to cancel its FONOPs, the United States could at least notify China beforehand. In this way, precautionary measures also have an overlap of Chinese and US interests.

The category of prevention and the category of communication and management in themselves also have overlaps. Making the entailment clear could help identify these overlaps. For instance, national nuclear risk reduction centers (NNRRCs) between the United States and Russia can be used for both crisis prevention and communication purposes. If this can be made clear, one more topic has a higher chance of being on the China–US table. In this way, disputes over frameworks could be at least mitigated, if not entirely resolved.

Priorities for Potential Mechanisms

When it comes to the step of designing concrete mechanisms, whether they are prevention, communication or management mechanisms, several issues should be given higher priority to make the mechanisms effective.[10] The first issue concerns timeliness. According to the current practices and protocols between China and the United States, all the existing channels require prior notice of more than 24 h to arrange a phone call. This prevents a swift establishment of contact, which is critical in any incident or crisis.

The second is regarding the regular maintenance of the mechanisms. As past cases including the Hainan Island incident in 2001 and the balloon incident in 2023 have shown, Beijing is usually reluctant to answer phone calls from Washington at times of major incidents or crises. While this could be driven by multiple factors, including political ones, a lack of regular maintenance is also believed to be a key factor. NNRRCs between the United States and Russia demonstrate a good example as they

[10] This is mostly derived from a series of track-2 US–China dialogues on maritime crisis management held by the Centre for Humanitarian Dialogue between 2019 and 2022. Although the dialogues focused on conventional-level crisis management, there are lessons that can be learned and applied to the nuclear domain.

routinely transit messages every 2 hours to test and practice regular maintenance (Gottemoeller and Daniil 2023, 2).

The exchange of clear information and clarification of facts should be prioritized. At times of incidents and crises, certain messages conveyed may not be comprehended in the way the sender would wish. It is worth considering ways to standardize messages, so they can be conveyed clearly and efficiently in a mutually agreed format.

Sustain Arms Control Talks with Other Parties

Besides the United States, China should also sustain its arms control talks with US allies in the region and beyond to reduce nuclear risks. This has become more imminent in recent years. In Northeast Asia, for instance, discussions around upgrading the nuclear arrangement with the United States have been heated in Japan and the ROK, while in the latter country, even the idea of developing indigenous nuclear capabilities is becoming normalized and gaining wider support (Choi 2024; Dalton and Perkovich 2024; Kelly and Kim 2024). The perception of "China threat" has also grown in the region, with special concerns given to Beijing's "rapid and unclear" nuclear expansion. To stop fueling such concerns, Beijing could consider increasing its diplomatic and military-to-military engagement with its neighbors. This could also advance Beijing's proposal of an NFU treaty, as it is widely believed the US regional allies are the biggest opponents to the United States adopting anything similar to NFU due to their concern over China's military strength (Sevastopulo 2021).

From Beijing's perspective, a major concern is that the security issues of two theaters – Asia-Pacific and Transatlantic – become increasingly intertwined, which would induce more involvement of European countries or NATO in Asia-Pacific security. As the DPRK's involvement in European security increases, this concern will only grow. From the European side, suspicion over China's nuclear ambition has also grown significantly to the point that in almost all arms control conferences/seminars in Europe, there is a session on China, whereas a decade ago this was not the case. To reduce risks of mutual misperception and miscalculation, it is critical for Beijing to not only continue (so far, at least the European Union, France, Germany, the Netherlands, Switzerland and the United Kingdom have regular track-1 arms control consultations with China) but also consider increasing its engagement with European countries on arms control issues.

Consider Transparency Measures

To reduce nuclear risks triggered by increasing misperceptions and potential miscalculations and in the context of its growing nuclear arsenal, China could consider carrying out more transparency measures than "transparency of intention and policy" alone (a term used in contrast to transparency of number). While it is understandable that China feels uncomfortable releasing much with a relatively small arsenal and that not all transparency measures contribute to a better security environment, it is worth considering what measures could increase transparency without leading to insecurity. For instance, clarifying that the silos do not mean a shift to LOW posture and clarifying that its short-range missiles do not carry nuclear warheads could all serve this goal. Such clarifications could be released in a regularly updated White Paper on Chinese nuclear forces. China's most recent missile pre-launch notification – sent to a targeted group of countries – in September 2024 is a positive start for transparency and its value is recognized by countries including the United States (Kuramitsu 2024). Such measures should be encouraged and continued.

Uphold Unilateral Commitments

China's unilateral commitments, such as its unconditional NFU policy and NSA, in themselves have great value in nuclear risk reduction. As previously mentioned, China has never employed nuclear threats in any of its conflicts or disputes with other countries and has proposed to transform these commitments into multilateral agreements. At a time when international arms control proposals are generally lacking and norms eroding, such endeavors should be valued rather than overlooked. Despite criticisms from other countries on NFU for lacking credibility – and this should be addressed rather than simply ignored – it is in the interest of both China and the international community for China to continue upholding these commitments and making efforts to make them acceptable multilaterally.

Encourage Informal Exchanges

Exchanges on the track-2 level are equally important in reducing misperceptions between countries. While nominally, China continues to promote international exchanges, in practice, procedures that Chinese interlocutors need to go through to be approved to attend international exchanges have been growing significantly in the past decade. The same tightening trend applies to foreign nationals visiting Chinese institutions for exchange. Based on the author's experience, this has significantly hampered exchanges between Chinese and international experts, especially on international security topics. The relevant authorities should consider streamlining the procedures needed and aim at creating a genuinely positive environment for such exchanges to reduce risks triggered by increasing misperceptions.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Notes on Contributor

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