



# DOCUMENTATION

## **Document No. 1. Brad Roberts, “China and the 2021 US Nuclear Posture Review,” Testimony Before the U.S.-China Economic and Security Review Commission, June 10, 2021.**

Secretary of Defense Lloyd Austin’s February 2021 designation of China as the “pacing threat” invites important questions about how US nuclear policy and posture might have to adapt. These questions are given added salience by recent revelations about the accelerating growth of China’s nuclear arsenal. What impact should China’s nuclear policy and posture, and their modernization, have on US nuclear policy, deterrence strategy, and force planning?

To frame brief answers to these questions, my remarks will survey key issues in the Nuclear Posture Review (NPR) process, now just getting started by the Biden administration. But some context is needed to inform that survey, as provided here with three brief observations about the past, present, and future.

### **Setting the Context**

First, since the end of the Cold War, there has been a great deal of continuity in US nuclear policy toward China. That continuity reflected some shared judgments across the Clinton, Bush, and Obama administrations. Some of these carried into the Trump administration; some did not. To be sure, there were some other important discontinuities through this period. With some over-simplification, the shared judgments were that:

- the US-China relationship was not fundamentally adversarial and thus the two could benefit by putting their nuclear focus on strategic stability rather than deterrence
- significant problems in the strategic military relationship sat somewhere in the future, not in the present
- China’s nuclear modernization was troubling largely for China’s lack of transparency and uncertainty about its end-goal and not because new capabilities were reaching the field
- the two could keep nuclear weapons in the background of the political relationship and thereby avoid having to contend with them as an irritant in the political relationship, in contrast to the US-Russian relationship
- toward that end, high-level, substantive, and sustained dialogue focused on nuclear issues and/or strategic stability would be of interest and benefit to both sides
- the US and Russia could take another modest step or two in reducing nuclear arsenals without worrying too much about a Chinese “sprint to parity”
- the extended nuclear deterrent in Northeast Asia could be shaped with an eye primarily on deterring North Korea and assuring South Korea and Japan

All four administrations also praised the virtues of “tailored deterrence,” meaning they rejected the idea that “one size fits all” in a world in which multiple potential adversaries must be deterred. During this period, policymakers hedged against a potential military



flashpoint over Taiwan and determined that the US should be ready to deter China in crisis and to attempt to restore deterrence if it were to fail.

Conspicuously today, few experts in the defense community adhere to these long-standing tenets. We stand at a potentially major turning point in US nuclear policy. The political and military relationships have shifted onto a new ground that is much more competitive and confrontational, at the same time that new information is emerging about China's modernization of its nuclear forces.

Second, China is not today the "pacing threat" for the U.S. nuclear posture—Russia is. Russia's nuclear force is significantly larger than China's. It is also significantly more diverse in the types of weapons and delivery systems it includes. Russia's nuclear weapons complex has a unique capacity for large-scale output. Moreover, Russia has gone much further than China in integrating nuclear weapons into all of its general-purpose military forces and has a capacity far superior to China's to dominate nuclear escalation at all levels of war. For decades the US has committed to maintain a nuclear deterrent that is "second to none." China's force does not drive that requirement the way Russia's does. With time, China's growing forces may change this calculus.

Third, China is not only modernizing its nuclear forces, it is diversifying them and increasing their numbers. Its envisioned end-state is unclear; perhaps it doesn't have one. In our thinking about China's nuclear future, it is important to clearly distinguish what we know from what we don't know. We know that China will be more capable, with a modern triad, modern warheads, and modern command and control. We know that China will be more competitive, with a modern design and production infrastructure for both warheads and delivery systems. We also know that it will be more confident in its ability to accept military risk. What we don't know is whether a more capable, competitive, and confident China will also be more assertive and aggressive. China's assertiveness in its maritime environs and use of force in "gray zone" strategies to try to settle territorial claims, in combination with its economic coercion of its trading and financial partners are troubling indicators of what may lie ahead.

We also know that China is building up its nuclear force; but we don't know whether the strategic balance with the United States will shift, as that depends in part on what the United States does in response. We know that China's no-first-use policy has been under pressure of various kinds; we don't know whether the traditions of nuclear minimalism will be overtaken by contemporary concerns. We don't know what President Xi meant when in 2016 he promised "a great rise in strategic capabilities" and in 2017 "breakthroughs...in strategic deterrence capability." Nor do we know what he meant when in 2020 he promised that by 2049 China would become "a leader in terms of composite national strength and national influence...at the center of the world stage" where it will have "the dominant position."

We can make many predictions about China's nuclear future but we must also recognize that the future is littered with uncertainties. We must also recognize the possibility that the United States may have little or no influence over the next choices China might make about its strategic future. The Biden administration's review of defense strategy, and the associated integrated strategic review, will have to frame responses to these "knowns" and "unknowns" and to the general challenges of coping with uncertainties.

### **China in US Nuclear Policy**

*China in US nuclear declaratory policy.* Each new president publicly declares the conditions under which he or she might consider employing nuclear weapons. Over the decades, there have been very few changes in first principles. But President Biden has introduced the possibility of one, which will be considered in the review process. Every prior president of the nuclear era has declared that the fundamental purpose of US nuclear weapons is to deter nuclear attack on the US or its allies. No president has been willing to take the extra step to declare that this is the sole purpose. In the case of President Obama, for example, he judged that there was a narrow range of plausible contingencies in which the vital interests of an ally or even the US could be put in jeopardy by non-nuclear means. So he rejected "sole purpose" while vowing to work to create the conditions that would enable it to be safely adopted at a future time. On the campaign trail, Joe Biden expressed his support for "sole purpose," stating that, "as president, I will work to put that belief into practice, in consultation with the US military and US allies."

China will not be the key driver of this decision. But it would welcome such a declaration, given its own no-first-use declaratory policy and its long-standing advocacy that the US adopt "no-first-use." ["Sole purpose" and "no first use" are similar but not identical promises of nuclear restraint; the differences vary with specific definitions.]. Such a declaration would be unlikely, however, to result in significant changes to China's nuclear policy or posture. While China would welcome such a US declaration, Japan would not. Its leaders believe that its vital interests can be put at risk by non-nuclear means; they strongly hope that the country that defends it (the US) will not foreswear its most powerful tool for contending with that threat. Japan, South Korea, and Australia are all anxious on this score as the balance of conventional forces in the region shifts in China's favor, thereby weakening the preferred strategy of deterrence by denial (that is, by having the means to prevent its military success).

China will factor in the US debate about "sole purpose" in at least one other respect. There will be a debate about whether such an unverifiable declaration would be accepted by others as credible—that is, as likely to be true in time of crisis and war. The credibility of such declarations is called into question by the fact that the Soviet Union long maintained a "no-first-use" policy publicly while in secret it planned and prepared for first use. Skepticism will be reinforced by the perception of many that China's rapid expansion of its force, and development of certain capabilities that make sense primarily if used first, signals that it

retains its declaratory policy for public messaging but not as a guide to actual military plans and preparations.

*China in the Biden administration's "strategy to put diplomacy first."* The new administration's commitment to "elevate diplomacy as our tool of first resort" will be reflected in an ambitious agenda of nuclear diplomacy encompassing arms control and nonproliferation. In this context, the administration has repeated the calls of its predecessors for China to join it in a dialogue about strategic stability and in the arms control process. The NPR will have to account for the fact that China has rejected such calls for decades. As its response to Trump diplomacy makes clear, it is unwilling to be coerced to the table. If the Biden administration is to be successful in engaging China in substantive, sustained, high-level dialogue, it must find arguments that persuade China rather than simply pressure it. Repeating standard US calls for Chinese transparency and restraint will do little to advance meaningful diplomacy.

*China in US assurance strategy.* NPRs also generally offer assurances of various kinds, including to US allies of its resolve to defend them, to nonproliferation partners of its commitment to the NPT, and to Russia and China of conditional strategic restraint. Prior administrations have assured China that US homeland missile defense "is not aimed at China;" none has been particularly troubled that China rejects these assurances as not credible. Moreover, China has regularly sought an assurance it has never received: that the US accepts mutual vulnerability as the basis of the strategic military relationship. The US has not contested mutual vulnerability and thus the condition exists de facto. But that is not the same thing as making a political statement. Prior administrations have refrained from accepting the condition as a political fact for multiple reasons, including the concern that it would be read in Beijing and Tokyo as appeasement. The 2021 NPR will have to consider whether or not to offer such an assurance. It may be that such a clarification would be reassuring to China and slow its pace of nuclear modernization. Or it may be that such a clarification would be irrelevant in China's calculus. Or it may be that it would be seen as a temporary development in US nuclear policy, given the decades of US ambivalence about answering the question—essentially "too little and too late."

### **China in US Deterrence Strategy**

*China and the commitment to take steps to reduce the role of US nuclear weapons.* The Biden administration has clearly articulated this commitment but has not specified which steps it might or when it might take them. It hopes that by taking steps it will provide leadership by example, thereby encouraging others to do the same. Its NPR is highly likely to call on China to do the same. But China rebuffed similar efforts by the Obama and Trump administrations. China also made it clear that it was unwilling to follow the United States in seeking to substitute non-nuclear means for nuclear means to reduce the number of nuclear weapons. Little can be gained for the US by simply repeating the calls of prior administration. Given its ongoing nuclear modernization, China is likely to be an obstruction to the Biden administration's effort to further reduce the role of US nuclear weapons.

*China in tailored deterrence.* NPRs also generate presidential guidance on how to operationalize deterrence. As a factor in US deterrence planning, China is changing as it becomes more capable. China is well along in becoming a nuclear peer to the United States—in qualitative, not quantitative terms, with its completion of a nuclear triad, development of a theater-range force and early warning system, integration of non-nuclear strike and defensive capabilities, and development of conventional power projection capabilities for potentially escalatory conflicts. It is also well along in becoming a multi-domain peer to the United States—with significant new cyber, spacer, and counter-space capabilities. Its theater deterrence and defense posture is also robust and still rapidly improving. As a quasi-peer, it puts new demands on US deterrence strategy. The 2021 NPR will have to identify those demands and tailor responses. The simultaneous deterrence of Russia, China, and North Korea will demand more planning capacity at US Strategic Command and close collaboration between STRATCOM and the relevant regional combatant commands.

### **China and US Force Planning**

*China and the US 'second to none' strategy.* As noted above, the US has long maintained a “second to none” approach to sizing its nuclear force, as a signal that it will neither allow itself to slip into an inferior strategic position nor compete to try to gain superiority. [Note that this applies to its strategic forces, not the non-strategic forces in Europe, where Russian forces outnumber US forces by a ratio of approximately an order of magnitude.] In the 2021 NPR, the Biden administration will have to think through whether and how “second to none” fits a world in which both Russia and China are growing their nuclear forces and deepening their strategic cooperation. Numerous hard questions will have to be answered. Does a multipolar nuclear environment create new nuclear requirements for the US? Are the reductions so far made in US nuclear forces through arms control irreversible? Should future reductions be irreversible? And what might retirement of the US ICBM force imply for the desired balance with China? At the very least, it would substantially reduce the number of targets in the US that would have to be struck in an attempted preemptive strike, perhaps leading some in China to think that such a counterforce strike might be successful in crippling the US capability to respond militarily.

*China and extended nuclear deterrence in Northeast Asia.* Recent US administrations have explained the role of the US nuclear umbrella over Japan and South Korea in terms of the North Korean threat. As China deploys additional nuclear weapons and/or nuclear-capable delivery systems in the region, and as it projects power more widely, questions arise about the role of the umbrella vis-à-vis China. The 2021 NPR will have to consider what changes to the extended deterrent, and to strategic communications about it, are warranted by China’s nuclear modernization, if any. China will deeply oppose any explicit US statement that US weapons might be brought into the region for potential attack on China. Such a statement would also result in intensified Chinese pressure on US allies not to support that role. In this circumstance, allies would seek stronger reassurance. Moreover, the emerging North Korean nuclear threat has generated new demands for “more NATO-like” nuclear deterrence

arrangements in the region, which an administration committed to reducing nuclear roles might find difficult to pursue.

*China and the nuclear hedge.* Each NPR since the Cold War has reflected leadership concerns about possible sudden erosion in the security environment as well as concerns of the technical community about unwelcome surprises of a technical kind, whether in an aging US nuclear weapon or in an enemy's secret toolkit. Hence each NPR has brought renewed statements of intent to ensure that the capabilities and capacity remain in the weapons design and production complex to enable timely responses to surprise. There has also been a rising focus on how to hedge against the programmatic risk in trying to precisely sequencing the rarely attempted simultaneous modernization of multiple warheads and delivery systems. But the necessary investments have proven politically challenging. The 2021 debate over the necessary nuclear hedge is likely to be intense, given both the expense and the opposition of those who believe that nuclear reductions should be irreversible and investments should not be made to enable the future production of new nuclear weapons. The open-ended expansion of China's nuclear force is likely to make it harder to argue against such investments. China's own success in developing its weapons complex and infrastructure and endowing it with the needed capabilities and capacities offers an object-lesson in focus and resolve.

### **China and the Integrated Strategic Review**

This survey implies that all of the important questions about the impact of China's nuclear modernization on US national security will be dealt with by the NPR. That is incorrect. The nuclear issue is not separable from broader developments in China's military strategy and improving capabilities to engage in modern strategic warfare that is multi-domain and multidimensional in character. A sound answer to the China nuclear problem requires a sound answer to the integration problem.

China thinks in such broader terms. It sees the bilateral US-PRC nuclear relationship in the context of the broader relationship of the strategic military capabilities of the two countries. These include missile defenses and non-nuclear strategic strike capabilities and perhaps also the associated enabling capabilities in cyber space and outer space. Especially from China's perspective, the credibility of its threat to retaliate by nuclear means if attacked by the United States is undermined by the US deployment of long-range precision non-nuclear strike capabilities, other so-called "left of launch" capabilities, and homeland missile defenses. China's military planners fear that these capabilities may be used in combination to preemptively eliminate China's assured retaliation posture. They fear also that the simple presence of these US capabilities might embolden the US to try to coerce China. Having struggled with this problem since at least the early 1990s, China's military planners long ago recognized the need to integrate the strategic military toolkit for deterrence and defense purposes.

Today, the United States is playing catch up, conceptually and organizationally. From 9/11 to 2014 or so, its military focus was elsewhere. Catching up requires more complete and effective integration of multi-domain operations. This requires getting operational concepts right. At present, they are not. As the bipartisan National Defense Strategy Commission concluded in its 2018 report, the US military “could well lose” a war against China or Russia because it has not so far developed the concepts necessary to successfully counter an adversary’s escalation strategies, nuclear and otherwise. Accordingly, the Biden administration’s review of nuclear policy and posture is being conducted in the context of a broader “integrated strategic review.” The aim is to produce an updated defense strategy that fully integrates strategic and nonstrategic dimensions of war as well as nuclear and non-nuclear aspects.

That integrated review will also likely involve decisions about the further development and deployment of homeland missile defenses and of long-range, precision, prompt, non-nuclear strike capabilities (as well as space and counter-space capabilities as well as cyber and infrastructure resilience). The last administration set a “simple goal” for missile defense: “to destroy any missile launched against the US, anywhere, anytime, anyplace.” Its pursuit of hypersonic strike capabilities was driven by a vision of “over-matching” strategic forces. The Biden administration will have to chart its own course. It is likely to reject these goals. But the alternatives are not as clear as they once were, when the threats were less sophisticated and numerous and the technical choices fewer. China can be expected to compete to maintain confidence in its threat of assured nuclear retaliation and is well hedged against the need to do so. Whether promises of US restraint would be met with reciprocal restraint is an open question today. The prospects of successfully responding to China’s strategies for deterrence and competition are improved with a US policy and posture review process that sees the problem whole, rather than breaking it in pieces with stove-piped capability reviews.

The integrated strategic review is a good idea. It will help frame the right big China questions for US defense strategy. But as an ambitious innovation, it is likely to fall short in some respects.

Expectations should be kept modest.

What Should Congress Do?

On a bipartisan basis wherever possible, Congress should:

1. Ensure that strategic issues in the China-US military relationship receive the necessary sustained leadership focus from the Biden administration. The Congress can do so by maintaining its own focus. And by highlighting serious concerns about China’s nuclear modernization without sounding alarmist.

2. Set its expectation that:
  - a. The Biden National Defense Strategy will fully and effectively address the concerns raised in the 2018 report of the NDS Commission about the US lack of conceptual preparedness for regional wars against nuclear-armed adversaries.
  - b. The administration's integrated strategic review will produce a coherent answer that sets out the specific contributions of different deterrence capabilities (regional and strategic, offense and defense, kinetic and non-kinetic, nuclear and non-nuclear) and the approaches needed to contain the risks of strategic escalation in multi-domain warfare.
  - c. The administration's review of nuclear policy, deterrence strategy, and force planning accounts comprehensively and substantively for the China factor.
  - d. In doing so, the administration will take full account of allied views.
3. Oppose the adoption by the administration of minimum deterrence or analogous strategies. These are strategies built on the premises that nuclear weapons are so destructive that very few weapons are needed and that the threat to employ them in retaliation is always credible.
4. Continue to support the Program of Record for nuclear modernization as formed by the Obama administration and adopted with minor modifications by the Trump administration. This includes needed investments in warheads, delivery systems, and the associated infrastructure and expertise.
5. Invest to encourage the needed intellectual bandwidth on these issues. Toward this end, task the administration to report on what institutional capacity has been created at DoD and in its support elements to ensure a steady flow of new insights about China's approach to modern conflict, including its strategic dimensions. The last administration was right to emphasize the need to out-compete, out-innovate, and out-think US adversaries. After three decades of sharp atrophy in the institutions that generate strategic thought for the US government, more needs to be done to generate the needed focus and excellence for the long term.

Brad Roberts is the director of the Center for Global Security Research at Lawrence Livermore National Laboratory. The views expressed here are his personal views and should not be attributed to the laboratory or its sponsors. Dr. Roberts served as deputy assistant secretary of defense for nuclear and missile defense policy from 2009 to 2013. In that capacity, he served as co-director of the Obama administration's Nuclear Posture Review and Ballistic Missile Defense Review. Dr. Roberts also helped found and lead a DoD-sponsored unofficial US-China nuclear deterrence dialogue that spanned nearly 20 years. Key insights from that process are discussed in his edited monograph *Taking Stock: US-China Track 1.5 Nuclear Dialogue* (CGSR Occasional Paper 2020). His most recent publication is "Orienting the 2021 Nuclear Posture Review" in the summer 2021 issue of *The Washington Quarterly*.



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**Document No. 2. General Glen D. VanHerck, United States Air Force, Commander, United States Northern Command and North American Aerospace Defense Command, Statement before the Senate Armed Services Committee, Subcommittee on Strategic Forces, June 9, 2021.**

Chairman King, Ranking Member Fischer, and distinguished members of the Committee: Thank you for the opportunity to testify, and for allowing me the honor of representing the Soldiers, Sailors, Airmen, Marines, Guardians, Coast Guardsmen, and civilians of United States Northern Command (USNORTHCOM) and North American Aerospace Defense Command (NORAD), including the members of the Canadian Armed Forces who are a vital and essential part of the NORAD team.

Since I assumed command of USNORTHCOM and NORAD, each day has afforded me the opportunity to lead a workforce of dedicated, innovative, and resilient warfighters and public servants. That fundamental commitment to our vital missions is clearly evident as USNORTHCOM and NORAD have kept the watch and defended our nations in what is certainly the most dynamic and complex strategic environment I have encountered in my 33 years in uniform.

Our competitors continue to take increasingly aggressive steps to gain the upper hand in the military, information, economic, and diplomatic arenas. USNORTHCOM meets each of those challenges head-on—and we have done so while supporting whole-of-government efforts to safeguard our citizens through the coronavirus pandemic and historically severe hurricane and wildfire seasons, and also simultaneously synchronizing the deployment of troops to support federal law enforcement personnel on the southwest border. The cascading events of the past year placed unprecedented strain on our people, our interagency partners, and our institutions, and I am proud that we overcame each of those challenges and emerged more resilient.

That steadfast commitment is more important than ever as our competitors continue to challenge our homelands through multiple means in all domains. Defending our nations, our citizens, and our way of life requires constant vigilance, and USNORTHCOM and NORAD have demonstrated time and again that our commands remain determined, focused, and ready. But we must keep moving forward. Looking to the future, we will continue to pursue innovative capabilities and strategies to detect, deny, deter, and, if necessary, defeat potential threats posed by peer competitors, rogue nations, transnational criminal organizations, and foreign and domestic violent extremists. No matter the challenge or circumstance, this Committee should rest assured USNORTHCOM and NORAD are always on guard.

## **Threats**

The global geostrategic environment continues to rapidly evolve. While the United States has spent the last 30 years projecting power forward to combat rogue regimes and violent extremists overseas, our competitors pursued capabilities to circumvent our legacy warning and defensive systems and hold our homeland at risk. Peer competitors like Russia and China are undermining the international rules-based order and challenging us in all domains. Further, rogue states like North Korea and Iran are also pursuing capabilities to nullify our military advantages, threaten our networks with cyber weapons, and—in the case of North Korea—develop nuclear weapons. Meanwhile, violent extremist organizations continue to devise plots to attack our citizens and our way of life.

During the Cold War, we were overwhelmingly focused on defending the United States and Canada from a single nation-state threat. After the Soviet collapse, Iraq's invasion of Kuwait, and later the attacks on September 11, 2001 we shifted our focus to non-state and rogue actors. Today, we don't have the luxury of focusing regionally or on only one threat at a time. In the last decade, we've seen a sharp resurgence in the nation-state threat as our global competitors deploy increasingly sophisticated capabilities to hold the United States and Canada at risk and limit our options in a crisis. Concurrently, the terrorist threat continues to evolve in ways that challenge our homeland defense capabilities. As a result, today's threat environment is likely the most complex we have ever faced, as potential adversaries threaten us in all domains and from all vectors.

## **Russia**

Russia presents a persistent, proximate threat to the United States and Canada and remains the most acute challenge to our homeland defense mission. Russian leaders seek to erode our influence, assert their regional dominance, and reclaim their status as a global power through a whole-of-government strategy that includes information operations, deception, economic coercion, and the threat of military force.

In peacetime, Russian actors conduct sophisticated influence operations to fan flames of discord in the United States and undermine faith in our democratic institutions. In crisis or conflict, we should expect Russia to employ its broad range of advanced capabilities nonkinetic, conventional, and potentially nuclear—to threaten our critical infrastructure in an attempt to limit our ability to project forces and to attempt to compel de-escalation. Offensive capabilities Russia has fielded over the last several years include advanced cyber and counterspace weapons and a new generation of long-range and highly precise land-attack cruise missiles—including hypersonics. These capabilities complicate our ability to detect and defend against an inbound attack from the air, sea, and even those originating from Russian soil.

Russia also continues to modernize all three legs of its nuclear triad. In December 2019, Russia fielded the world's first two intercontinental ballistic missiles (ICBMs) equipped with a hypersonic glide vehicle payload that will challenge our ability to provide actionable warning and attack assessment. In the coming years, Russia hopes to field a series of even more advanced weapons intended to ensure its ability to deliver nuclear weapons to the United States. These include the Poseidon transoceanic nuclear torpedo and the Burevestnik nuclear-powered cruise missile, which—if perfected—could enable strikes from virtually any vector due to its extreme range and endurance.

Finally, Russia continues to conduct frequent military operations in the approaches to North America. Last year, NORAD responded to more Russian military flights off the coast of Alaska than we've seen in any year since the end of the Cold War. These Russian military operations include multiple flights of heavy bombers, anti-submarine aircraft, and intelligence collection platforms near Alaska. These efforts show both Russia's military reach and how they rehearse potential strikes on our homeland. Last summer, the Russian Navy focused its annual OCEAN SHIELD exercise on the defense of Russia's maritime approaches in the Arctic and Pacific. The multi-fleet exercise, intended in part to demonstrate Russia's ability to control access to the Arctic through the Bering Strait, included amphibious landings on the Chukotka Peninsula opposite Alaska, as well as anti-submarine patrols and anti-ship cruise missile launches from within the U.S. Exclusive Economic Zone.

## **China**

China continues to pursue an aggressive geopolitical strategy that seeks to undermine U.S. influence around the globe and shape the international environment to its advantage. In the USNORTHCOM area of responsibility, China has made deliberate attempts to increase its economic and political influence with our close partners in Mexico and The Bahamas. While the United States remains the economic and military partner of choice in the region, China is seeking to grow its trade and investment in Mexico and, over the past few years, has invested in The Bahamas' vital tourism sector through marquee infrastructure projects. Militarily, China is rapidly advancing a modernization program that seeks to erode our military advantages and deter us from intervening in a regional conflict.

China remains among the world's most capable and brazen cyber actors, stealing volumes of sensitive data from U.S. government, military, academic, cleared defense contractors, and other commercial networks each year. In a crisis, China is postured to transition rapidly from cyber exploitation to cyber attack in an attempt to frustrate our ability to flow forces across the Pacific, and globally. China also continues to advance its counter-space capabilities that could threaten our space-based communications and sensors. In the foreseeable future, China will likely be able to augment its cyber-attack capabilities with a new family of long-range precision-strike weapons capable of targeting key logistical nodes on our West Coast that support U.S. mobilization and sustainment.

China also continues to expand and modernize its strategic nuclear forces to rival those of Russia and the United States in sophistication, if not in numbers. Over the last decade, China fielded dozens of road-mobile ICBMs and several ballistic missile submarines designed to enhance the survivability of China's nuclear deterrent and ensure its ability to retaliate following any attack. In the next decade, China will deploy a new generation of advanced weapons—some of them hypersonic—that will further diversify their nuclear strike options and potentially increase the risks associated with U.S. intervention in a contingency.

### **North Korea and Iran**

The Kim Jong Un regime has achieved alarming success in its quest to demonstrate the capability to threaten the U.S. homeland with nuclear-armed ICBMs, believing such weapons are necessary to deter U.S. military action and ensure his regime's survival. In 2017, North Korea successfully tested a thermonuclear device—increasing the destructive potential of their strategic weapons by an order of magnitude—as well as three ICBMs capable of ranging the United States. In October 2020, North Korea unveiled a new ICBM considerably larger and presumably more capable than the systems they tested in 2017, further increasing the threat posed to our homeland. The North Korean regime has also indicated that it is no longer bound by the unilateral nuclear and ICBM testing moratorium announced in 2018, suggesting that Kim Jong Un may begin flight testing an improved ICBM design in the near future.

Iran continues to advance its military technologies and threaten the security of U.S. forces and allies throughout the Middle East. Iran adheres to a self-imposed range limit on its ballistic missile force that prevents it from directly threatening the United States. Nonetheless, Iran is developing and testing ICBM-relevant technologies through its theater missiles and space launch platforms—including its first successful orbit of a military satellite in April of 2020—that could accelerate the development of a homeland-threatening ICBM should Iran's leaders choose to pursue such a system. Iran retains the ability to conduct attacks via covert operations, terrorist proxies, and its growing cyber-attack capabilities, which it has already employed against U.S. financial institutions.

### **Defending the Homeland**

USNORTHCOM's defense of the homeland provides the foundation for the full spectrum of the Department of Defense's worldwide missions and supports the missions of every other combatant command. The ability to deploy forces overseas, support allies, deliver humanitarian assistance, and provide presence and reassurance around the globe relies on our ability to safeguard our citizens, as well as national critical infrastructure, transportation nodes, and leadership. As competitors field highly advanced and agile long-range weapons systems and seek to act on growing territorial ambitions, we are adapting our thinking, evolving our own capabilities, and enhancing our operations and exercises to accurately reflect a changing world while remaining a relevant force.

The United States has long relied on our nuclear arsenal to serve as the strategic deterrent against an attack on our homeland. In today's threat environment, strategic deterrence remains foundational to our national defense. A safe, secure, and effective nuclear force remains the most credible combination of capabilities to deter strategic attack and execute our national strategy. The U.S. strategic deterrent has helped to maintain a careful balance between nuclear powers and remains the bedrock of our national defense, as the longstanding doctrine of deterrence by punishment makes clear to potential adversaries that a large-scale attack on the United States or our allies would result in an overwhelming and devastating response.

However, over the last decade, our competitors have adapted new techniques and fielded advanced weapons systems with the potential to threaten the homeland below the nuclear threshold. Simply stated, the missiles and delivery platforms now in the hands of our competitors present a significant challenge to our legacy warning and assessment systems and defensive capabilities. Advanced systems posing threats to the homeland have already been fielded in large numbers, and our defensive capabilities have not kept pace with the threat. The notion that the homeland is not a sanctuary has been true for some time, and that will remain the case for the foreseeable future. Therefore, we must ensure effective nuclear and conventional deterrents are in place to defend the homeland and ensure our ability to project power where and when it is needed.

Highly advanced cruise missiles, hypersonic missiles, and stealthy delivery platforms provide our competitors with the ability to hold targets in the homeland at risk with conventional weapons. That fact has led us to emphasize improved all-domain awareness and the development of a layered sensing grid to provide warfighters and decision makers at the strategic, operational, and tactical levels with increased awareness and decision space.

The reality of a vulnerable homeland and the risks associated with rising global competition are driving our commands to collaborate with interagency and industry partners to find and deliver smarter, more affordable technology. To outpace our competitors, we cannot be satisfied with incremental steps; instead, we must continue to increase the pace and tempo of our technological advancements. This work is essential, and we are proud of our close collaboration with a host of interagency and industry partners and international allies as we work together to outthink our competition, outpace threats, and defend what we hold most dear. That global focus and cooperation is also reflected in our growing wargaming capacity, including major homeland defense exercises such as VIGILANT SHIELD and our participation in the Large Scale Global Exercise series.

### **The Path to Decision Superiority**

I believe our future success in USNORTHCOM, our fellow U.S. combatant commands, and NORAD requires **all-domain awareness, information dominance, and decision superiority**. Our competitors have invested heavily in weapons systems that can be

launched against distant targets with little to no warning, as well as stealthy delivery platforms specifically designed to evade detection by existing sensors. As a result, the successful execution of USNORTHCOM and NORAD missions in the digital age relies on significantly improving global **all-domain awareness** through the development of a fused ecosystem of networked sensors extending from space to the seafloor.

This network will pull data from an array of repurposed systems, legacy sensors enhanced through low-cost software modifications, and a limited number of new sensors to provide robust indications and warning and persistent tracking of the full spectrum of potential threats to the homeland from the seafloor to on orbit. Integrating and sharing data from this global sensor network into common platforms will allow leaders to observe potential adversaries' actions earlier in the decision cycle, providing more time and decision space at all levels.

That decision space is where the true value of improved domain awareness resides.

Harnessing the capability of distributed multi-domain sensors, machine learning, and artificial intelligence will provide military leaders, the intelligence community, and senior civilian officials with the information necessary to anticipate, rather than react to, competitors' actions.

All-domain awareness is the first critical step on the path to **decision superiority**, and USNORTHCOM and NORAD require and have prioritized capabilities that improve our domain awareness and global integration with our fellow warfighters. Sensors and systems such as Over the Horizon Radars, polar satellite communications, Integrated Underwater Sensor Systems, and space-based missile warning and tracking sensors are essential to our missions. And while the benefits to continental defense are clear, these capabilities will also help every U.S. combatant commander around the world while enhancing USNORTHCOM and NORAD's collective ability to defend the United States and Canada.

In September 2020, just after I assumed command of USNORTHCOM and NORAD, the commands partnered with the United States Air Force and United States Space Command in the second onramp demonstration of the Air Force's Advanced Battle Management System (ABMS). This large-scale joint force demonstration established a network with embedded machine learning and artificial intelligence to rapidly detect, track, and positively identify a simulated cruise missile threat, while providing a common operating picture and all-domain awareness for commanders at multiple levels.

The ABMS onramp demonstration provided a brief but exciting glimpse into the future of USNORTHCOM and NORAD. By creating potential pathways for accessing and distributing data in ways that allow leaders to think, plan, and act globally rather than relying on outdated regional approaches, we are significantly amplifying the capability of the joint force. Through these and other efforts, USNORTHCOM and NORAD are actively working to deliver

**information dominance** by fusing new technologies to increase decision space for commanders and senior civilian decision makers. Ultimately, our objective is to enable leaders and commanders all over the world to quickly assess any situation and take the steps necessary to stay well ahead of an adversary's next moves in order to deter and deny in competition, deescalate in crisis, and defeat in conflict.

In March of this year, USNORTHCOM and NORAD led a Global Information Dominance Experiment (GIDE) that brought leaders from all 11 combatant commands together in one collaborative environment. GIDE demonstrated the strategic value of Joint All-Domain Command and Control by allowing combatant commands to rapidly share information across all domains and collaborate in near real-time. During this experiment, which included a NORAD live-fly exercise, we worked with industry partners to fuse all-domain sensing within a common data system in order to develop globally integrated courses of action and advance the Joint Force's **information dominance** capability. This experiment demonstrated the power of artificial intelligence and machine learning tools, which have the ability to expand decision space for decision makers. Through GIDE events, we will continue to test these capabilities, improve global integration, and help the DoD and allies increase **all-domain awareness** to enable **information dominance**—and ultimately achieve **decision superiority**.

The prototype Pathfinder data analytics project provides another example of how USNORTHCOM and NORAD are working to leverage existing but stovepiped data streams to the benefit of both operational and strategic decision makers. In our ongoing prototype efforts, Pathfinder gathers data from multiple distinct military and civilian air domain sensors and, through automation and machine learning models, produces a fused common operating picture to improve the reliability of the data and increase the decision space that will someday soon be available in real time to our assessors and watch-standers. This low-cost, rapidly developed system will have long-term benefits for our domain awareness and has already shown some of the advantages that information dominance will provide to warfighters around the world.

Information is power, but only if it is accessible, sharable, and actionable. Unlocking the enormous potential of the data currently being collected by a global layered sensor grid will allow us to gain a decisive advantage over competitors and potential adversaries. Currently, vast quantities of data are trapped by incompatible systems and antiquated organizational structures. Breaking down these stovepipes is achievable, but doing so will require innovation and coordination across various agencies, to include technology that allows for timely exploitation of the massive volume of data collected by our sensor networks. More importantly, it will also depend on breaking away from a culture that favors compartmenting and isolating information, in order to fully realize the full potential of our capabilities—including those that reside with our allies and partners. As the defense and intelligence communities connect systems and sensors, consideration of national electromagnetic

spectrum management policies is needed to ensure that necessary connections and bandwidth are accessible.

As our competitors rapidly develop and deploy advanced capabilities with clear intent to overcome the U.S. technological advantage, the Department of Defense and the U.S. Government as a whole must also modernize our requirements and acquisition processes to stay ahead. Given the current pace of technological advancement, we must take full advantage of the forward-thinking solutions our industry partners can offer. To succeed in this era of Great Power Competition, it is essential to rapidly deliver capabilities to the warfighter by streamlining the processes for prototyping, testing, and moving promising technologies into production.

The success of USNORTHCOM and NORAD's Pathfinder program, along with much of the work done by DOD's Defense Innovation Unit, show what is possible when we provide innovators and technical experts the resources and flexibility to tackle even the most daunting challenges. The same approach should also be applied to software development and acquisition. Success in competition and in conflict will increasingly depend on the ability to field software based capabilities faster than our adversaries. For that reason, I am encouraged by the new model championed by the Office of the Under Secretary of Defense for Acquisition and Sustainment that will enable the Department of Defense to acquire software through modern development practices and deliver needed capability at the speed of relevance.

Armed with timely and accurate information, equipped with modern sensors and software, and backed by a flexible and responsive conventional deterrent that provides defeat mechanisms below the nuclear threshold, commanders and senior civilian leaders will achieve **decision superiority** with the options and time necessary to allocate resources wherever needed to deny or deter aggression in competition, de-escalate potential crises, and defeat adversaries should conflict arise.

## **Missile Defense**

### ***Ballistic Missile Defense***

The need for a robust and modern ballistic missile defense system has been strongly reinforced over the past year. Despite U.S. efforts in 2020 to reach an agreement with Kim Jong Un, North Korea continued its development of ICBMs capable of striking targets in the United States. As North Korea continues its pursuit of advanced long-range strategic weapons— including the new systems displayed during their 10 October 2020 parade— USNORTHCOM remains committed to maximizing the capability and capacity of our ballistic missile defense systems.



USNORTHCOM is focused on developing and fielding advanced sensors capable of tracking potential missile threats and providing improved discrimination capability to our warfighters and assessors. Simultaneously, USNORTHCOM is collaborating with our partners in the Missile Defense Agency (MDA) to ensure that the Next Generation Interceptor (NGI) is fielded and operational as soon as possible. Of note, USNORTHCOM worked hand-in-hand with MDA to ensure all of our operational requirements are addressed in the NGI acquisition process. When fielded, NGI will add 20 interceptors to the current inventory, and will provide greater reliability and capability.

As competitor missile technology advances, USNORTHCOM is also working with MDA toward a layered missile defense capability that will allow for a more flexible and responsive defense of the homeland against both ballistic missile and cruise missile threats. The successful engagement of an ICBM-class target by an SM3-IIA interceptor on 16 November 2020 was an historic achievement and a critical step toward establishing this layered capability. Defending the United States homeland against the ballistic missile threat remains a complex and technically challenging endeavor, and I am grateful to the Committee for your continued support as we take the steps necessary to ensure the success of this critical mission.

### ***Cruise Missile Defense***

As evidence of both the global nature of the threat and the implicit trust in our bi-national command, NORAD is developing the requirements for the defense of the United States and Canada against advanced cruise missiles. In this capacity, NORAD works closely with the U.S. military Services, the Canadian Joint Operations Command, and a host of other dedicated DoD and Canadian Defence Ministry partners to share costs and ensure a clear, common understanding of the threat and what will be required to mitigate the risk to our nations.

Modern cruise missiles are difficult to detect and can be launched from significant distances against targets in the United States and Canada from launch sites on Russian soil and by long-range bombers, attack submarines, and surface vessels. Whether subsonic or hypersonic, these missiles can range targets in the homeland and present a very real challenge for our defensive capabilities. Russia has already amassed an inventory of both nuclear and conventional variants, while China is expected to develop similar capabilities in the next decade.

The proliferation of these systems creates all the more incentive for focused investments in improved sensor networks, domain awareness, and information dominance capabilities. Those investments, coupled with the development of layered denial, deterrence, and defeat mechanisms capable of addressing current and emerging threats, are fundamental to the defense of our homeland.

## Conclusion

As USNORTHCOM and NORAD look to a future marked by rapid shifts in the geopolitical environment and technological advancement, we are guided by the lessons of the past. Key among those is that we cannot overcome challenges in isolation. By viewing changing conditions and competitor actions from a global perspective, our problems become more solvable and the solutions more affordable. USNORTHCOM and NORAD will continue to build our partnerships, collaborate with fellow warfighters, and work toward overcoming shared problems rather than continuing to focus on point solutions to isolated threats.

To that end, I look forward to working with the Committee and with all of our innovative industry and interagency partners as we move quickly to develop and field the capabilities required to defend our nations now and well into the future. Together, I believe we can eliminate outdated barriers that only serve to stifle information sharing, and simultaneously foster a mindset that favors creative, forward-looking approaches over unproductive reliance on legacy systems and processes.

Finally, and perhaps most importantly, we will continue to prioritize our most vital asset: our people. With that in mind, I would like to take this opportunity to publicly recognize the select group of USNORTHCOM and NORAD personnel responsible for standing the operational watch 24 hours a day, every day. Their mission is crucial to our defense, and these military and civilian watch-standers have spent much of the last year under strict but necessary isolation protocols to mitigate the risk of a COVID outbreak. They and their families have endured long periods of separation during an already difficult time, and they have done so without any expectation of public recognition. I am honored to lead men and women of such selflessness and professionalism, and our citizens should rest assured these extraordinary defenders have the watch.

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**Document No. 3. U.S.-China Economic and Security Review Commission, *2021 Report to Congress of the U.S.-China Economic and Security Review Commission* (Washington, D.C.: U.S. Government Publishing Office, November 2021), pp. 340-342, 371-373.**

**Section 2: China's Nuclear Forces: Moving Beyond a Minimal Deterrent (pp. 340-342)**

### Key Findings

- The People's Republic of China (PRC) is carrying out its most substantial effort to expand, modernize, and diversify its nuclear forces since first acquiring nuclear weapons in the 1960s. The People's Liberation Army (PLA) is developing a nuclear triad; fielding new, more mobile, and more accurate nuclear weapons systems; and

significantly expanding its stockpile of nuclear warheads. The PLA has also enhanced its intelligence, surveillance, and reconnaissance (ISR) systems.

- China's nuclear buildup puts it on a trajectory to become a nuclear peer of the United States in qualitative terms. Qualitative nuclear parity could entail diversified, reliable, and survivable delivery systems; highly precise missiles; warheads of various yields; robust command and control processes; and sophisticated ISR, all of which enable a truly secure second-strike capability and options for calibrated, offensive nuclear use. Current public projections suggest China could also become a quantitative peer in the number of land-based strategic missiles it deploys by 2030.
- Strategic and political forces are driving China's departure from a minimalist nuclear posture. For most of its modern history, China maintained a small nuclear stockpile mainly suitable for minimal retaliation against an adversary's nuclear attack. General Secretary of the Chinese Communist Party (CCP) Xi Jinping's ambitions for great power status, combined with military objectives beyond minimal retaliation, have likely motivated the recent buildup of China's nuclear arsenal.
- At minimum, China's nuclear buildup enhances its current retaliatory strategy by better enabling its nuclear forces to deter or respond in kind to a nuclear attack. Chinese leaders may worry that innovations in other nuclear weapon states have undermined their nuclear deterrent, requiring them to make changes in order to keep up.
- The scale of China's nuclear buildup, however, suggests it could also be intended to support a new strategy of limited nuclear first use. Such a strategy would enable Chinese leaders to leverage their nuclear forces to accomplish Chinese political objectives beyond survival, such as coercing another state or deterring U.S. intervention in a war over Taiwan.
- Uncertainties created by China's nuclear buildup heighten the risk of an accidental nuclear exchange or unforeseen nuclear escalation during a regional conflict. Specific risks of nuclear escalation stem from entanglement between China's nuclear and conventional capabilities, its desperation to avoid losing a conventional war in the region, and false alarms that could result from its possible shift to a launch-on-warning posture.
- The PLA's growing arsenal also casts "nuclear shadows" over China's disputes with its neighbors, many of whom are U.S. allies and partners. Improved nuclear capabilities could encourage Chinese leaders to coerce or initiate a conventional conflict against U.S. allies or partners in the region if they believe their nuclear capability would deter the United States from intervening.
- China has continued to play a concerning role in the global proliferation of missile and nuclear technologies, though the manner in which this proliferation occurs has evolved over time. Whereas two decades ago the Chinese government and state-owned enterprises (SOEs) were the main source of missile and nuclear technologies,

Chinese companies and private individuals now play a dominant role in the proliferation of such goods to countries of concern. The Chinese government turns a blind eye to, and in some cases tacitly supports, these illicit activities.

## Recommendations

The Commission recommends:

- Congress direct the Administration to conduct an interagency review of any Chinese universities that maintain research or training arrangements with China's nuclear weapons research institutes, such as the Chinese Academy of Engineering Physics and the Northwest Institute of Nuclear Technology. The review should be led by the U.S. Department of Energy and include the U.S. Departments of Commerce, Treasury, and Defense; the Intelligence Community; and other federal departments and agencies as appropriate. The review would:
  - Assess the impact of such cooperation on China's nuclear weapons programs and capabilities;
  - Assess whether current U.S. export controls adequately address risks from the transfer and exchange of information and technologies with applications to nuclear research, particularly by researchers and departments in relevant academic disciplines at U.S. universities to these Chinese universities;
  - Identify Chinese universities and research institutes that should be added to the Entity List, based on the risks posed by their cooperation with the Chinese Academy of Engineering Physics, Northwest Institute of Nuclear Technology, and other Chinese institutions involved in nuclear weapons development, as appropriate;
  - Identify Chinese universities and research institutes that merit a presumption of denial for all export licenses involving items covered by the Export Administration Regulations; and
  - Develop and maintain a list of all academic partnerships in fields with applications to nuclear weapons development entered into between Chinese universities and U.S. universities that receive federal funding for the purpose of determining whether these activities are subject to export controls.
- Congress prevent the erosion of U.S. strategic nuclear superiority and respond to China's qualitative and quantitative theater nuclear advantages by directing the Administration to continue implementation of the Obama-Trump Program of Record for nuclear modernization.
- Congress enact legislation creating an independent bipartisan commission, similar to the Quadrennial Defense Review commissions authorized in the past, to assess the Nuclear Posture Review and advise Congress about whether the current U.S. nuclear

posture is sufficient to maintain deterrence against the expanding Chinese and Russian nuclear forces. The Commission should:

- Determine how Russian and Chinese nuclear capabilities have changed between 2010 and 2022;
  - Evaluate whether the current number of U.S.-deployed strategic weapons is sufficient to deter both Russia and China over the next 20 years; and
  - Identify any further changes required to U.S. force posture, doctrine, and missile defense.
- Congress authorize funding for a comprehensive diplomatic strategy on nuclear deterrence and arms control. This comprehensive program would include:
    - Intelligence diplomacy with key allies and partners in the Indo-Pacific and in Europe to inform them of developments in China's nuclear forces;
    - Dialogue to convince these allies and partners to pressure Beijing diplomatically to enter into arms control talks and to explore these partners' willingness to host U.S. intermediate-range forces and other U.S. assets; and
    - Continued efforts to engage both Russia and China in trilateral arms control talks, including by continuing efforts with Russia to persuade China to enter into arms control discussions.

### **Implications for the United States (pp. 371-373)**

The rapid buildup of China's nuclear arsenal signals a clear departure from the country's historically minimalist nuclear posture. It suggests Chinese leaders are more expansively redefining the requirements of their assured retaliation strategy and potentially even contemplating a more ambitious strategy envisioning the first use of nuclear weapons to accomplish China's regional objectives. As Dr. Roberts observes, the significance of China's buildup for the United States "depends, in part, on China's answer to the question, 'How much is enough?'" and that so far, "China has given us no answer."<sup>212</sup>

China's nuclear buildup puts it on a path to become a qualitative nuclear peer of the United States in around a decade, with a similarly diversified, precise, and survivable force.<sup>213</sup> Such a force would give China a truly secure second-strike capability as well as options for highly calibrated nuclear use that could support both their current assured retaliation strategy and a new strategy of limited nuclear first use in the region. China could even become a quantitative nuclear peer if projections for the growth of the land-based leg of the nuclear

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<sup>212</sup> Brad Roberts, oral testimony for the U.S.-China Economic and Security Review Commission, *Hearing on China's Nuclear Forces*, June 10, 2021, 188.

<sup>213</sup> Brad Roberts, Director of the Center for Global Security Research at Lawrence Livermore National Laboratory, interview with Commission staff, August 27, 2021; Brad Roberts, written testimony for the U.S.-China Economic and Security Review Commission, *Hearing on China's Nuclear Forces*, June 10, 2021, 4-5.

triad are correct. Regardless of what the future holds, however, several troubling implications are already apparent.

First, China's growing nuclear capabilities create uncertainty and raise the risk of accidental or unforeseen nuclear escalation during a regional conflict. Because some of the PLA's conventional and nuclear forces and supporting infrastructure are either comingled or indistinguishable, the United States might accidentally attack nuclear capabilities in the course of attacking nonnuclear capabilities during a conventional war in the Indo-Pacific. Such a situation could lead to "crisis instability" whereby China resorts to nuclear first use in order to preserve its nuclear deterrent, which it believes to be in serious danger. Reducing the risks stemming from entanglement in the PLA will be challenging because Chinese leaders may worry they will undermine deterrence or reduce operational efficiency if they agree to reduce entanglement.<sup>214</sup> Moreover, Chinese leaders may not believe that accidental nuclear escalation is a serious concern. The belief that inadvertent escalation is unlikely actually makes it more probable, however. As several nuclear experts affiliated with the Carnegie Endowment for International Peace argue, this view "leaves political and military leaders less inclined, in peacetime, to take steps that could mitigate the risks and more inclined, in wartime, to interpret ambiguous events in the worst possible light."<sup>215</sup> Similar risks of unintentional nuclear escalation could stem from a launch-on-warning posture, which is prone to false alarms.

Second, China's growing nuclear capabilities raise the risks that a conventional conflict in the Indo-Pacific could escalate to a deliberate nuclear exchange, though these risks are still small in absolute terms. The expansion, modernization, and diversification of China's nuclear forces give the PLA greater flexibility, resiliency, and capacity to use its nuclear weapons. According to Dr. Roberts, the result of these changes "will be a China that's more confident in running risks, military and political, and more risk for the United States in defending its interests in a conflict over Taiwan or elsewhere in the region with China."<sup>216</sup> In a high-stakes conventional war, Chinese leaders could conceivably decide to threaten or engage in limited nuclear use against U.S. conventional forces and bases for fear of losing the conflict or their grip on power.

Third, China's growing nuclear capabilities could strain U.S. extended deterrence by emboldening conventional aggression or nuclear coercion against U.S. allies and partners. As China's nuclear arsenal grows, Dr. Roberts observes, Chinese leaders could become confident in their "ability to suppress escalatory responses by the United States because of

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<sup>214</sup> James M. Acton, Tong Zhao, and Li Bin, "Reducing the Risks of Nuclear Entanglement," *Carnegie Endowment for International Peace*, September 12, 2018.

<sup>215</sup> James M. Acton, Tong Zhao, and Li Bin, "Reducing the Risks of Nuclear Entanglement," *Carnegie Endowment for International Peace*, September 12, 2018.

<sup>216</sup> Brad Roberts, oral testimony for the U.S.-China Economic and Security Review Commission, *Hearing on China's Nuclear Forces*, June 10, 2021, 188.

the long shadow of nuclear weapons.”<sup>217</sup> With stability achieved at the strategic level, Chinese leaders may feel more confident in their ability to use conventional force to resolve territorial disputes over Taiwan, the East China Sea, or the South China Sea. They could also stop short of using force and instead rely on their nuclear arsenal for coercion. Chinese leaders’ possible interest in threatening nuclear use to deter Japanese involvement in a Taiwan contingency seemed evident in the decision by a municipal Chinese government authority to repost on social media a video threatening Japan with nuclear war in July 2021 after Japanese leaders made statements indicating they could come to Taiwan’s defense.<sup>218</sup>

Fourth, improvements in China’s nuclear forces could complicate U.S. nuclear deterrence planning in the future even if they do not presently threaten the survivability of U.S. nuclear forces. Never before has the United States faced two peer nuclear-armed adversaries at the same time. The pace of China’s nuclear modernization, the expansion of its nuclear warhead stockpile, and the extent to which it cooperates with Russia may require the United States to reexamine its deterrence strategies and force posture. Dr. Roberts told the Commission the major challenges for the United States in the decades ahead are “whether, as China’s nuclear force grows ... we need a strategic force of our own that’s larger as well” and “whether [China and Russia] are an additive problem or whether China remains a lesser-included problem because it’s a smaller force.”<sup>219</sup>

Fifth, China’s expanding nuclear arsenal raises the specter of an arms race. China’s longstanding refusal to engage in arms control inhibits deeper arms reductions by the United States, exacerbates the anxiety of U.S. allies, and prompts other countries to hedge in their nuclear strategies.<sup>220</sup> Chinese leaders may be uninterested in creating mechanisms for crisis communication and management because, as Mr. Denmark observes, “the way they make decisions, the way they share information, does not lend itself well to those sorts of communications.”<sup>221</sup> Without China’s participation in arms control, an unbridled arms race between the world’s major nuclear powers could develop and U.S. allies and partners in the Indo-Pacific could decide to pursue their own nuclear deterrents.

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<sup>217</sup> Brad Roberts, “Taking Stock: U.S.-China Track 1.5 Nuclear Dialogue,” *Lawrence Livermore National Laboratory*, December 2020, 51.

<sup>218</sup> Emily Clark, “Military Fanboys’ Shared a Video Threatening Nuclear War. This Is Why China Allowed It,” *ABC News*, July 19, 2021.

<sup>219</sup> Brad Roberts, oral testimony for the U.S.-China Economic and Security Review Commission, *Hearing on China’s Nuclear Forces*, June 10, 2021, 217.

<sup>220</sup> Brad Roberts, oral testimony for the U.S.-China Economic and Security Review Commission, *Hearing on China’s Nuclear Forces*, June 10, 2021, 140.

<sup>221</sup> Abraham Denmark, oral testimony for the U.S.-China Economic and Security Review Commission, *Hearing on China’s Nuclear Forces*, June 10, 2021, 214.

Finally, the Chinese government's tolerance for Chinese companies and individuals' proliferation of dual-use technologies undermines the global nonproliferation regime and poses a different type of nuclear threat to U.S. allies and partners. The nuclear and ballistic missile technologies provided by various Chinese entities to Iran,

North Korea, and Pakistan over the years will continue to threaten the security of U.S. allies and partners such as Israel, Saudi Arabia, South Korea, Japan, and India. Combined with the direct threat posed by the PLA's growing nuclear arsenal, the indirect threat posed by such proliferation will increase the pressures on U.S. allies and partners to develop missile defenses and credible second-strike capabilities of their own.

