

THE NEXT U.S. STRATEGIC POSTURE — AND THE POSTURE AFTER NEXT

Workshop Summary

July 8-10, 2020

Center for Global Security Research
LAWRENCE LIVERMORE NATIONAL LABORATORY

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On July 8-10, the Center for Global Security Research (CGSR) at Lawrence Livermore National Laboratory (LLNL) hosted a workshop titled “The Next U.S. Strategic Posture – And the Posture After Next.” This session brought together participants drawn across the policy, military, and technical communities in the United States and among allies. The event was a follow-up discussion to CGSR’s last meeting titled “Fit for Purpose? The U.S. Nuclear Posture in 2030 and Beyond.” The July workshop had a broader scope and looked at the different elements of U.S. strategic posture, including not just nuclear capabilities but missile defense, conventional prompt global strike, and space and cyberspace. Participants assessed the 2030 U.S. posture relative to the predicted Russian and Chinese postures, and they examined what capabilities will be crucial beyond 2030.

Discussion was guided by the following key questions:

- What will be the main attributes of the US strategic posture in 2030?
- Relative to the predicted Russian and Chinese strategic postures of 2030, will the US position have improved, stayed the same, or eroded? Why?
- What factors should guide the development of capabilities beyond 2030?

Key take-aways:

1. The US strategic posture is diversifying. First missile defenses began to take on strategic functions, then counter-space capabilities, and now precision conventional strike and cyberspace are demonstrating strategic potential. As the strategic toolkit diversifies, new instabilities and vulnerabilities are also emerging.

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2. The US strategic toolkit is also becoming more robust. The next strategic posture promises to be an incremental improvement on the 2020 posture. But the posture after next could be substantially different.
 - a. By 2030, the nuclear deterrent will have been partially modernized but little changed; by 2040, it may include new and different weapons.
 - b. 2030 will not bring significant new developments in missile defense systems except perhaps some quantitative increases in the current systems. In contrast, 2040 could be an important milestone for missile defense, and it could see the development and dispersal of experimental new technologies, along with changing demands for defense systems to be effective.
 - c. By 2030, the US, Russia, and China may all have deployed hypersonic strike weapons, potentially in significant numbers.
 - d. By 2030, US space capabilities will have become more strategic in potential effect; by 2040, they could become more decisively advantageous to the US.
 - e. As the US strategic toolkit diversifies, there is a rising premium on the US ability to effectively integrate strategy, plans, and operations. Truly integrated strategic deterrence remains a distant goal.
3. In the emerging strategic competition among Russia, China, and the US, a net assessment of winners and losers in 2030 is very difficult to construct. Properly crafted, it would include all-domain expertise, clear metrics, allied expertise, both classified and unclassified components, and appropriately tailored war-gaming and red-teaming. Despite a great deal of fluidity and uncertainty, it seems unlikely that the net balance of strategic power and influence will have shifted dramatically in favor of any of the three by 2030. None should be able to conclude that it is in a position to seize and hold some gain bearing on a vital interest of another.
4. US allies are cautiously optimistic that the regional deterrence architectures to which they and the US contribute capabilities will be fit for purpose in 2030. But they see many challenges on the road ahead arising from assertive and creative adversaries, emerging and disruptive technologies, and the need for comprehensive strategies that integrate political, military, and economic factors.
5. Cutting across this discussion was an oft-voiced concern about the level of intellectual effort so far invested in designing the US strategic posture of the future and in understanding and mitigating the risks of a strategic free-for-all.

Panel 1: The U.S. Nuclear Deterrent in 2030 and Beyond

- What is the existing modernization plan?
- What factors might obstruct success? Might new requirements emerge?
- What impact might alternative arms control futures have on modernization?

Nuclear modernization has so far enjoyed strong political support within the US government, but there are major obstacles and concerns with the existing plans that might undermine their implementation in the coming years. The first obstacle is program execution. The United States has embarked on the most ambitious nuclear modernization effort since the Cold War with a nearly simultaneous replacement of each leg of the triad. Due to the difficulty of synchronizing all these efforts, problems could emerge that disrupt the entire modernization roadmap. One possible problem is the occurrence of program delays. A delay in any one program is likely to reverberate through all other programs and possibly jeopardize the entire modernization endeavor. These delays could happen in part because many Cold War production processes must be re-learned; many of the personnel working on nuclear modernization do not have experience in these tasks. Additionally, the budget and workforce constraints might limit flexibility because of the simultaneous nature of the modernization programs. In order to overcome these program execution obstacles, the Department of Energy (DoE) must address these concerns with Congress and make sure that its priorities are clear to adequately prepare a credible nuclear deterrent approaching 2030 and beyond.

The nuclear stockpile must also be flexible enough to keep pace with evolving threats. Nuclear modernization has been at the forefront of Russian military strategy, making it imperative for the United States to modernize its stockpile in a way that addresses new deterrence challenges. Another consideration is the increasing vulnerability of stealth aircraft and submarines. If advanced sensors can make stealth aircraft susceptible to detection, or if submarines can be tracked in the near future, the US defense posture will face significant problems.

The need to overcome the obstacles to modernization is not only important for the purpose of deterring adversaries, but also for the purpose of assuring allies. Infrastructural readiness plays a major role in building allied confidence in the US nuclear stockpile. A specific example is plutonium pit production. The US is falling behind in this field, and if progress is not made in this specific aspect of manufacturing, allies may lose confidence in the ability of the United States to modernize its arsenal and respond to changing threats and emerging requirements.

So far, political disagreement has not been an issue plaguing nuclear modernization. Both the Obama and Trump administrations have sustained legislative support for modernizing the stockpile, in part by combining arms control and deterrence strategies in a single nuclear strategy. But bipartisan support is fragile, since the Trump administration has not delivered much on the arms control end of the bargain.

With regards to arms control, there is a growing need to pressure China to come to the table, and slow the growth of its nuclear arsenal. China may double its arsenal by 2030, and a possible future of arms control cooperation with China might reverse this trend. In order to create a climate for arms control discussions with China, the United States needs to force China to realize

that arms control is in its best interest. This will require the help of allies in Asia and Europe as well. Encouraging NATO members to cooperate and push China to negotiate an arms control treaty might change the current political climate, and create favorable conditions for trilateral arms control talks.

Panel 2: Missile Defense in 2030 and Beyond

- What capabilities are likely to be in place in 2030?
- What technical options might the US then have for new capabilities by 2040?
- How much is enough? What factors should guide the further development of the US homeland defense posture? Of regional defenses?

2030 will not bring significant new developments in missile defense systems except perhaps some quantitative increases in the current systems. The Ground-based Mid-course Defense (GMD) system may have been augmented with a few additional interceptors and also reinforced with an underlayer of shorter-range Aegis and THAAD systems. Some modest tailoring of the defense to address the hypersonic threat with new sensors and interceptors is also likely. In contrast, 2040 could be an important milestone for missile defense, and it could see the development and dispersal of experimental new technologies, along with changing demands for defense systems to be effective. Directed energy weapons may have revolutionized the defense, along with a significant move to space.

A changing security environment and new technical possibilities bring with them significant new questions about how much missile defense is enough. A central question for the United States will be whether to continue to try to stay ahead of threats from the rogue states. On the one hand, no political leader can tell the Americans that they will not be protected against rogue states. On the other hand, new missile developments make expectations of having homeland missile defense capable to neutralize all rogue threats unrealistic. Russia and China already possess the capability to overwhelm US defenses, and rogue actors such as North Korea could also acquire such ability by 2040. The continued US pursuit of staying ahead and rejecting mutual vulnerability might not be possible with North Korea if its arsenal grows to more than a hundred intercontinental-range ballistic missiles. In such case, as with Russia and China, the United States may need to increasingly rely on nuclear deterrence to prevent large-scale threats from rogue states.

Even if the homeland missile defense would become incapable in the future of providing full protection against threats from rogue states, it could still serve a strategic purpose of thwarting red theories of victory. Limited missile defense systems, either homeland or regional, could erode the confidence of potential aggressors that a limited missile strike could force US allies to surrender and discourage the United States from acting on their behalf. Thus, in the mind of an adversary even a limited missile defense system may create doubts about the chances of escalation control, thereby inducing caution. In such a scenario, the only remaining option for the adversary would be a large-scale strike – a risky gamble that may lead to catastrophic retaliation from the United States and its allies.

Deterrence is but one element of a comprehensive approach to missile defense. Detecting, destroying or disrupting missile attacks requires not only active defenses but also passive defenses, and attack operations (left of launch). There is no single panacea. Future missile defenses will also have to integrate diverse and comprehensive methods to detect and intercept modern missiles, including hypersonic systems. Hypersonic tracking capability is expected in 2023-24 while developing and fielding interceptors will take longer. New missile defense methods could include experimental technologies such as microwave or directed energy defenses, but they could also integrate new applications of current technologies such as SM-3 IIA as an underlay of homeland defense and F-35 as a sensor. Addressing increasing A2/AD threats will require thinking anew about integration/interoperability between a territorial ballistic missile defense (BMD) and integrated air and missile defense (IAMD) that provides protection against cruise missiles. EUCOM and Indo-PACOM have been already working on this problem. There are A2AD risks to the US homeland as well, as potential adversaries may use missile capabilities to disrupt US efforts to mobilize its forces within the CONUS.

There is a general pessimism about the possibility for arms control agreements in this domain and Congress is not likely to agree to any legally binding limits on missile defense. This is partly because missile defense enjoys widespread support within the US government. In Congress, there has been a strong bipartisan agreement on expanding missile defenses. The only recent exception was the disagreement around the SM-3 IIA's role in defending the US homeland. While expansion is strongly supported, the national security community cannot assume that specific new technological developments will occur in the near future. Therefore, creative application of current capabilities should be pursued to address emerging threats.

On the cost-effectiveness of missile defense, the panel argued that—in principle—the defense of strategic targets is always cost-effective because of the high value of these strategic assets. At the same time, hit-to-kill interceptors are expensive and missile defense systems will be overwhelmed if the cost-per-missile is higher for defense than offense. As a result, future approaches to missile defense must consider the quantitative changes in adversary arsenals to remain a cost-effective deterrent.

There are diverging views of how adversaries view US missile defenses. One argument is that Russia and China are not seriously concerned about US missile defenses as they know all three powers could overwhelm each other's defenses. According to a different argument, Russia and China are legitimately apprehensive over the strength of US defense and US overconfidence about its military capabilities. The United States itself, however, should closely follow the missile defense efforts of Russia and China. In the next decades, quantitative changes in adversary capabilities could have important effects on US calculations about the credibility of its deterrent.

Panel 3: Conventional Prompt Strike in 2030 and Beyond

- What US capabilities are likely to be in place in 2030?
- What technical options might the US then have for new capabilities by 2040?
- How much is enough? What role should these capabilities play in US strategies to compete, deter, and win?
- Should the US ask more of its allies? If so, what?

In the next decades, long-range precision-guided hypersonic missiles with conventional payloads may play an enormous strategic role. These systems have the potential to transform missile defense requirements, threaten time-sensitive targets, and raise difficult new questions about strategic stability.

The development of hypersonic weapons changes some specific aspects of military competition. The lack of effective defense against hypersonic missiles forces a return to retaliatory deterrence and decreases the response time. Hypersonic weapons also may increase vulnerability of time-sensitive targets such as SAMs, mobile missile sites, and high-value ships. While hypersonic weapons could potentially provide certain ASAT or missile intercept capabilities, the biggest impact of the technology is the guaranteed ability to strike precise targets.

China and Russia are now ahead of the United States in the development and deployment of new hypersonic weapon systems. In particular, China modernizes much more rapidly than the United States with twenty times more tests, a substantial cadre of aerospace engineers, and a range of new capabilities, including the DF-17 hypersonic glide vehicle. Russia has already deployed hypersonic systems, such as the Avangard. The United States has several programs underway and in next years it plans to intensify their flight-tests.

By 2030, the US, Russia, and China may all have deployed hypersonic strike weapons, potentially in significant numbers. While a few of these may be intercontinental in reach, the vast majority are likely to be medium- and intermediate-range and designed for theater-strategic functions.

The US could potentially benefit from the deployment of medium-range conventionally-armed hypersonic weapons—perhaps even several thousand of them. Medium-range hypersonic weapons are much less expensive than intermediate- or intercontinental-range. They can strengthen deterrence against a conventional fait accompli by convincing potential attackers that the costs and risks of rapidly expanding a hypersonic battle are greater than the benefits. Hypersonic weapons could also be an element of a cost-imposing strategy against any country committed to thick area defenses.

At this time, there is no good reason to pursue a nuclear-armed variant. This is the case even though Russian and Chinese hypersonic weapons are dual-capable or exclusively nuclear as in the case of Russian Avangard system. Nuclear-armed hypersonic weapons do not represent a significant enough advancement for the US nuclear arsenal. Excluding the nuclear component in the hypersonic arsenal makes these weapons more usable by removing the risk of miscalculation and inadvertent nuclear escalation.

Regarding the development and deployment of hypersonic weapon systems, the challenges are more complex than simply the missiles themselves. In order for hypersonic weapons to be effective, they require investment in comprehensive ISR systems, and they need to rely on some level of automation or AI computing to be a potent threat to an adversary. In this area, the United States has an advantage over potential adversaries. This also creates the incentive and potential for allied cooperation in hypersonic capabilities. For example, a partnership with Japan might prove effective and would remove any threat of a potential capability gap with US adversaries. Because hypersonic missiles require such complicated support systems, the potential risks of proliferation to non-state actors are minimal at this time.

Even though new theater hypersonic systems offer certain benefits, these capabilities raise new questions about offense/defense and conventional/nuclear integration. Accordingly, their fit with the regional deterrence architectures of the US and its allies, and their fit with extended US nuclear deterrence remains an open question. They also raise difficult new questions about how to protect strategic stability as competition intensifies. This is the case even though the advent of hypersonic capabilities does not represent a significantly new challenge to strategic stability. For example, theater-range cruise missiles already shorten response time and their dual-capability creates a risk of inadvertent escalation. Effective defense against these missiles also remains challenging.

Despite all of the above, the advent of hypersonic weapons does not represent a significant threat to strategic stability for several reasons. The combination of intercontinental-range arsenals and long-range cruise missiles already present similar challenges that hypersonic weapons would not significantly exacerbate. Dual-capable missile systems already increase uncertainties in the minds of adversaries due to their ambiguous payloads that make it harder for the adversary to determine an appropriate level of response. Furthermore, the US, Russia, and China can already overwhelm each other's missile defense systems. Hypersonic missiles only make this slightly easier, but do not fundamentally transform the strategic scenario. While hypersonic weapons can certainly threaten new targets more effectively, this in itself will not revolutionize conflict. At the moment, concerns over an arms race are not justified and even if an arms race occurred, it would not threaten strategic stability. Altogether, the strategic community should not look at this technology through the lens of strategic stability but rather in the context of which missions they affect the most.

Panel 4: Space and Cyberspace in 2030 and Beyond

- Between now and 2030, are there likely to be substantial changes in US defensive and offensive capabilities in these domains? Of adversary capabilities?
- Might there be significant new technical options thereafter?
- How much is enough? What role should these capabilities play in US strategies to compete, deter, and win?

The main focus areas approaching 2030 will be working with allies to clearly articulate goals in outer space and cyber space, preparing for a potential space arms race, and defending space assets. A crucial task for the next posture and the one after that will be to address and fix ambiguities in outer space, as this domain is growing much more rapidly than the other domains.

With regards to cyberspace, the US cyber posture is looking robust. Currently, the personnel responsible for US cyber operations consists of 133 mission teams and over 6,000 people. This force includes 68 cyber protection teams that act defensively to protect critical information, and 27 cyber combat mission teams that support Combatant Commands in offensive operations. The United States places a larger emphasis on cyber defense than offense. Regardless of the current strength of the US cyber force, more work must be done to modernize cyber capabilities, grow cyber offense, and integrate cyber operations with other domains. In 2030 and beyond the United States should look into partnering with private companies to achieve a higher level of technical innovation.

The space domain is also experiencing changes and the United States must respond dynamically in the coming decade. The space domain is constantly changing and currently the choice orbits for space assets are beginning to switch from low Earth orbit (LEO) to geostationary orbit (GEO). This orbit switch will be significant in the years leading up to 2030 and the GEO region will be the focus of competition between Russia, China, and the United States beyond 2030. Russia is currently struggling to put more assets in GEO, so this is a weakness that the US should capitalize on in the coming years. Even though LEO is crowded, and GEO is becoming more favorable for space defense assets, the United States should focus on its ability to strike satellites in LEO in order to be prepared for a possible future space conflict.

In addition to bolstering space assets and increasing the number of satellites in GEO, the United States should expedite work in the area of counterspace. The United States currently does not have many counterspace systems in which it has high confidence, so it should focus on counterspace now in order to be prepared for a space conflict in the 2030s. The United States has some jamming systems but it must work to become more resilient in order to challenge China in space. China's ability to "out-grind" the United States in a space standoff will become increasingly concerning and thus more research and development is needed in counterspace capabilities that would close this gap.

The arms race in space might be inevitable and the United States needs to acknowledge this fact and plan accordingly. An arms race in 2030 and beyond will underline the need to develop new space assets that are resilient and capable of bolstering integrated operations. China and Russia are changing space capabilities every few years and the United States is struggling to keep its space capabilities as dynamic as adversary capabilities.

Another important feature of the future of cyber and outer space capabilities is the relationship of the US with its allies. Moving forward, it is imperative that the United States share intelligence and technology with allies. This will create a larger support network to hold adversaries accountable and it will also bolster the ability for the US to compete, deter, and win in these domains. The United States also struggles to discuss cyber defense needs with certain allies.

North Korea poses a significant cyber threat to South Korea, and the United States has not played as large of a role as it should in supporting South Korea diplomatically and technologically. Additionally, arms control treaties might become necessary (especially in the space domain) and US allies can participate in the discussion and help win favorable agreements for the United States.

Panel 5: Integration and the 2030 Strategic Toolkit

- Between now and 2030, what progress can be expected on conventional/nuclear integration? On offense/defense integration? On all-domain integration?
- What are the barriers to improved integration? Which are likely to prove enduring?

The United States continues to make progress on conventional-nuclear, all-domain, and offense-defense integration, but full and complete integration remains a distant goal. As the NDS recognizes, great power competition is back, and the United States needs to figure out how to fight conventional wars with nuclear-armed adversaries over limited objectives. Russia and China seem to understand this problem: the Russians never forgot this, while the Chinese have worked hard to figure it out in the past few years. The 2018 NPR set the US on a path to improve conventional-nuclear integration, but several questions remain with specific requirements in strategy, plans and capabilities.

The first question is how the United States can win conventionally, achieve its goals, and deter nuclear escalation at the same time. In terms of strategy, the US needs to convince its adversaries that it is able to run integrated conventional-nuclear operations. This will require integrated plans, and an understanding of how a conflict might unfold, and when and how adversaries might escalate. On the capabilities side, the United States will need to be able to decisively defeat an adversary in theater without threatening regime change in their homeland. A full range of capabilities is needed to ensure that the adversary cannot have certainty in achieving its goals in the theater.

The second question is how to restore nuclear deterrence after it fails in a limited way. With regards to strategy, integrated conventional-nuclear operations provide a wider range of options to respond to limited nuclear use, to deny the adversary the benefits that it hopes to achieve, and to impose costs that would make it clear that the benefits of further escalation will be smaller than the costs. In planning, it is not known how time-urgent the response is going to be, therefore pre-planned integrated options are needed in case time is a serious concern. In terms of capabilities, a combination of conventional forces is needed that can fight through a limited nuclear attack, and the US will also need a wide range of nuclear and conventional options to control escalation, and limit damage.

The third question is how to deter large-scale escalation during what could be a series of limited nuclear exchanges. In strategy, it is important to make it clear to the adversary that war aims are limited, and the US should operate in a way that reflects this. The United States also needs to establish a clear understanding of what might cause escalation (the strategic stability dialogues can help with this), and it needs to make sure that the adversary's large-scale response options

are not threatened while limited nuclear attacks are conducted. In this regard, there is an asymmetry in the location of targets – conflict is likely to happen in the periphery of adversaries, and targets might be in their homeland, while the United States will fight with its forward deployed forces and its homeland might not be attacked in the early phases. In planning, the US needs to integrate nuclear and conventional planning, and plan to “win without winning catastrophically.” Regarding the capabilities, there are two crucial elements: first, a secure second strike capability that is beyond doubt; and second, the US needs to make sure that adversaries will not mistake a limited attack to a preemptive counterforce attack.

All three challenges can be met, but the US needs to improve integration of strategy, plans and capabilities; and convince its adversaries that it is able to continue a theater conflict after limited nuclear escalation was initiated. Currently, a lot of work is happening at DoD on the strategy side, and a new joint warfighting concept is underway. In planning, a nuclear guidance is in place that is driving more conventional-nuclear integration. In capabilities, the NPR has improved the diversity in US non-strategic nuclear weapons, expanding the range of options. On the conventional side, if the focus and progress continue in strategy and plans, it will also drive the improvements in conventional forces. These should include elements such as integrated air and missile defense, or the dispersal of concentrated strike capabilities.

In the area of all-domain integration, there is still a gap in the thinking of the strategic community. The concept of integrated strategic deterrence basically means an understanding of the relationship among different types of capabilities at the strategic level and how they can be leveraged; achieving objectives for crisis management, intra-war deterrence, and management of escalation risk; and the ability enabled by this understanding to execute actions that apply some, or all of the available capabilities in support of these objectives. There are continued developments in non-nuclear tools that have strategic effects and interact with the nuclear domain. The US needs to better leverage its own capabilities, provide better options for leadership, and understand how synergies can be created and exploited. It is a hard problem and the US did not give it enough institutional thought.

In the context of fighting a conventional war with a nuclear-armed adversary, it is essential to improve understanding of how adversaries think about integrating their own conventional and nuclear capabilities, how sound their concepts are, and how much progress they have made. The United States needs to understand red lines, deal with the problems of attribution and messaging, develop some set of rules, and create organizing principles and norms. This it is not really a “playbook” but something that is useful in operating complex scenarios. Wargaming and exercising are important tools to meet this goal. Progress is made in concept development, but more creative approaches are needed instead of the current “stove piped reviews:” panelists mentioned the possibility of an integrated deterrence campaign plan, a national deterrence strategy, a strategic warfare concept – maybe STRATCOM’s joint operating concept could be a baseline to advance this goal. The United States needs to stretch its intellectual muscles, and it could form an expert commission to dig into the issue, like it was done by the Strategic Posture Commission in 2009. It could be something more informal, a preliminary step to transform the next cycle of strategic reviews.

The question of offense-defense integration is primarily relevant in the context of the rogue state deterrence problem. Against these states, the US does not rely on mutual vulnerability. Instead, the United States and its allies rely on active defenses to neutralize the threats, and use the offensive components of the toolkit (e.g. left of launch capabilities) to degrade and disrupt adversary missiles before they are launched. Since the Obama administration, there is focused attention on these capabilities – this offensive toolkit provides an opportunity to enhance active defenses. However, the US needs to properly organize its institutions to follow through the development of these capabilities, requirements need to be realistic, and strategic thinking is needed to identify the kinds of scenarios when these capabilities could be useful.

Better integration is an important element of closing the deterrence gap and chipping away red's confidence in their theory of victory. Thinking about these strategic problems requires fostering a mindset that understands the potential of nuclear use in a regional context and understands the role of nuclear coercion and ambiguity in adversary planning. To create a strategic community that is able to do all of the above, the conventional war-fighting and the nuclear planning communities need to come together and talk to each other. Messaging to adversaries, doctrine, exercises, capability improvements, leadership development and education in professional military institutions all need to evolve to facilitate better integration of the strategic toolkit.

Panel 6: A 2030 Net Assessment of the Central Strategic Balances with Russia and China

- How are leaders in Russia, China, and the US likely to assess the strategic military balance in 2030?
- Will they perceive it as stable and their interests in a credible deterrent secure? Why? Why not?
- Will the US have gained position, lost, or held steady? By what metrics?

Over the last decade, the Russian military has been engaged in robust modernization efforts. These are organized around multi-year state armament programs—the current one is the 2018-2027 SAP. Based on President Putin's statements, as long as he is president, we should not anticipate any major defense spending increases. Most modernization programs will be completed by the mid-2020s. The current force structure is shaped by the numerical limits of the New START agreement.

Since the early 2000s, Russia has been operationalizing its strategic warfighting concept. It has two concepts for retaliatory strikes: 1) responding in case of credible warning of an incoming attack (silo-based ICBMs are at the center of this concept), and 2) retaliatory strikes after the first missiles already hit Russia (mobile missiles are at the center of this latter concept). Russia has also been focusing on regional missions: it has about 2,000 non-strategic nuclear weapons, it has been upgrading its NC3 systems, and its missile defenses. Many of its new capabilities such as the Avangard, Sarmat, Posseidon, and Kinzhal systems are partly developed for regional missions. Russia is optimistic about US innovation and it has serious concerns about the

survivability of its second-strike capabilities. Russia's nuclear planning is centered around the United States, but it is also planning for a multipolar world.

Russia sees its conventional forces as tools for escalation management. Precision strike capabilities are developed to shift adversary risk calculation, and to signal deterrence messages. In Russia's view, strategic non-nuclear weapons are adding to the mix, but not replacing nuclear weapons. They are tools to inflict psychologic effect on the adversaries. Russia sees deterrence by defense as cost prohibitive and it does not believe that the US military could be successfully kept out of theater. In outer space Russia is looking into ways directed energy could help escalation management, and how adversary satellites could be dazzled. Although Russia's posture is primarily defensive, it has a more offensive posture in cyberspace. It has ongoing efforts to harness AI capabilities, but Russia is significantly lagging behind the US in civilian AI innovation. In the future, it will be important to watch how the Russian technological ecosystem evolves.

Beyond 2030, Russia will continue to worry about their second-strike capabilities, and monitor US technological advances. Since the early 2000s, Russian leaders have been under the impression that the United States does not take their security concerns seriously enough. Arms control remains very important for Russia since it reinforces parity and mutual vulnerability. Under certain conditions they may be willing to undertake deeper cuts in strategic nuclear forces, but they are also hedging against a more competitive post-New START world.

China has also been preoccupied with its efforts to match US military capabilities. China's modernization efforts are subject to many political and organizational constraints, and they also face some time constraints, especially in training personnel. The Chinese have maintained a high degree of centralized control over nuclear weapons. They managed to realize a number of goals that they set out in 2000. In 2030, the PLA is going to reflect the type of tasks that the PLA was looking at in 2000. Back in 2000, the goal of China was to deter US intervention in a Taiwan conflict. At the time, the PLA did not have conventional capabilities to force unification. A key question in the future is whether they will look at the development of their conventional capabilities with a goal to force reunification with Taiwan. China continues to have concerns about the survivability of its nuclear forces, given improving US counterforce effectiveness and missile defenses. However, they are not so worried about non-strategic nuclear attacks. Their current force structure is designed to complement their conventional weaknesses.

Beyond 2030, they will have greater diversity in strategic capabilities: nuclear weapons for retaliation and coercive diplomacy, non-nuclear strategic attack options, tools of information warfare, cyber capabilities, and outer space capabilities. They work to coordinate military deterrence with economic policy, using the space and cyber domains, as well as conventional missile capabilities. Their theory of victory rests on threats with non-nuclear attacks on the US, assuming that the US would rather step down and not respond with nuclear weapons. They do not have a plan for what would happen next if this plan did not work out. There is still very little discussion about how China might coordinate and deconflict these domains in a crisis. In general, the Chinese claim to be skeptical that nuclear war can be controlled, which creates some restraint.

China has a limited retaliatory force, and it is starting from a small and vulnerable baseline. In the next 10 years, it may not proceed to double its forces to 600. The size of the Chinese force will depend mainly on the effectiveness of the US BMD capabilities in the region, and also on the availability of fissile materials. Looking beyond 2030, whether China will be happy with its nuclear forces will depend greatly on the following factors: the Chinese confidence in their ability to carry out a conventional attack, how US integration of capabilities will evolve, the size of US nuclear and non-nuclear strategic attack capabilities, the BMD and cyber capabilities of US allies in the region, and the Chinese ability to limit arms racing, since they do not want to spend too much on nuclear forces.

Traditionally, the United States has responded to perceived vulnerabilities. In the Cold War, it dispersed its bombers and hardened its ICBM silos to address the emerging threats from the USSR. Developments in cyber space, outer space, anti-submarine warfare, and the integration of AI have the potential to drive many more dramatic changes to the US strategic posture. It is useful today to think of shift from MAD to MUD—mutual uncertain destruction. There is significant uncertainty about the 2030 military balance. The prospects of misunderstanding and inadvertent escalation are going to increase substantially. Each side will have more uncertainty and they will need to deal with that—maybe by deploying more weapons with better penetration capability.

In the next Nuclear Posture Review, the US must consider some significant steps to maintain high confidence in its secure second strike capabilities despite the developments noted above. These include: prepare to put bombers back on strip alert, deploy a stealthy modern TLAM-N, develop mobile and/or underground ICBMs, invest in nuclear command and control to make the “thin line” more resilient, and move to a launch under attack policy. It should also keep New START in place to keep an eye on Russia and seek better transparency with China, seek a moratorium on space-based interceptors and directed energy weapons, and also keep an eye on AI and how it could be employed in the integrated C2 systems.

Panel 7: A 2030 Net Assessment of Regional Balances

- Will NATO’s deterrence posture be fit for purpose in 2030?
- Will the deterrence postures of US alliances in the Indo-Pacific be fit for purpose?
- Why? Why not?

US allies are cautiously optimistic that the regional deterrence architectures to which they and the US contribute capabilities will be fit for purpose in 2030. But they see many challenges on the road ahead arising from assertive and creative adversaries, emerging and disruptive technologies, and the need for comprehensive strategies that integrate political, military, and economic factors. Some are doubtful that the extended nuclear deterrent posture now in place but largely designed in the 1990s can be effective against emerging challenges. Allies too are tackling new questions about offense-defense and conventional-nuclear integration. They also struggle with renewed and deeper doubts about US resolve to defend them whenever their vital interests might be at risk.

In Europe, NATO is looking to stay strong militarily, become stronger politically, and increase its reach to work more with like-minded partners across the globe. To do so, however, the Alliance must continue to work towards establishing a shared and realistic understanding of the security environment, based on a common threat assessment that takes all allies' concerns into account. Looking into a longer time-horizon, the Alliance will need to consider threats such as Chinese interests in Europe and its near abroad, as well as Russian presence in the Black Sea and the Mediterranean. This common assessment is vital to maintaining deterrence, which is strengthened when the alliance is able to speak with a single voice. US presence in Europe is considered another essential ingredient for the continuation of the alliance's ability to deter.

The second imperative is to maintain a robust posture that is both clearly demonstrated and clearly communicated. The panel discussed how NATO is looking to address threats using a 360-degree approach, as well as working to improve readiness and resilience and strengthen the Alliance's command structure. As for areas that still need improvement, the capacity for reinforcement was highlighted. Given the shortening time horizons presented by new technologies, it is important for the Alliance to be able to not only bring reinforcements from North America, but also move reinforcements from and around allies in Europe. Improvements are needed in the infrastructure of allies, the ability to move materials more effectively during peacetime, and storage of materials and equipment in Europe.

Along the same lines, NATO needs to grapple with the opportunities and challenges presented by emerging technologies such as AI, high-end sensors, and advanced analytics. These technologies need to be incorporated into NATO planning and wargaming, and there needs to be more consideration for the impacts of such technologies being developed by adversaries. Space was also discussed as an area where further development will be needed, as it was declared an operational domain last fall, but progress has been slowed by the current pandemic. All these improvements will ensure that NATO is able to create dilemmas for adversaries, rather than simply being prepared to handle future dilemmas presented to the Alliance.

In the Indo-Pacific, a more holistic approach to threat assessments is needed. Of particular concern is the growing economic influence of China. If China is able to recover quickly from the impacts of the pandemic, then other nations in the region may be more inclined to integrate further with it, despite understanding China's hegemonic intent. Further integration—particularly through digital dependencies on Chinese big tech companies in areas such as ecommerce and 5G—would make it easier for China to influence these nations and to gather intelligence through such reach.

A conflict over Taiwan is the most likely scenario for conflict in the region over the next 5-10 years. Evidence for this is the increasing emphasis on unification by CCP leadership, based on nationalistic sentiment, as well as the stage set by outside reactions to Chinese actions in Hong Kong. Other threats such as the buildup of Chinese military presence in the South Pacific, the threat of North Korean nuclear use, and conflict on the China-India border should not be discounted as well.

Alliance relations in the region were said to be on a good track to remain fit for purpose in 2030. The panel highlighted that the Quad (US, Australia, India, Japan) has had greater progress in areas of cooperation than expected, but India's participation remained largely at the operational level due to rising Hindu nationalism. Accordingly, the US-Australia-Japan trilateral relationship is growing increasingly strong. As for areas where this cooperation could be further improved, there might be opportunities for trilateral co-design of missile defense. The discussion could be opened up following Japan's decision not to purchase the Aegis Ashore system. As it stands, the ability for Australia and Japan to produce their own systems will be limited by intellectual property issues with the United States. Nevertheless, allies are strengthening their resilience, with a particular focus on increasing domestic manufacturing and recognizing the need to be able to produce vital supplies following the disruption caused by the pandemic. However, US capabilities remain key to their security, thus the panel stressed the need for a renewed conversation on extended deterrence in the region.

Panel 8: Conclusions and Implications

The strategic deterrent is multifaceted—nuclear weapons are foundational and continue to have a unique role, but this recognition brings up the question of integration and coherence. In this regard, progress has been relatively slow, and integration is still an elusive goal. The next posture is likely to be a somewhat improved version of the current posture, but the posture after next could be very different. Directed energy could play a transformational role, we could also see a new posture in space, and maybe a greater role for cyber capabilities. Is the US posture going to be fit for purpose? It depends on the purpose. Possible departures in US grand strategy are within the realm of the possible. There could be a more isolated United States, that has left its alliances, triggering major changes in the global environment.

Regional challenges are of increasing concern. The new problem of modern war is regional war against nuclear-armed adversaries that are capable of transregional and other forms of escalation. Some aspects of this challenge were thought through during the Cold War. Strategic thinkers have given plenty of thought to the nuclear and missile defense puzzle but cyber and space are mostly new domains to consider in these regional conflicts. These assets are fundamental to US nuclear posture and they have grave escalatory dangers for the nuclear domain. The 2018 NPR put nuclear options on the table in response to non-nuclear strategic attacks, but more thought is needed to understand how escalation in the grey zone could lead to non-nuclear conflict and then to nuclear conflict. The issue is how cyber and space plays into the nuclear arena and what the US should do about it. In the face of these slippery slopes, assured retaliatory capabilities and survivable NC3 systems will be crucial to avoid war with Russia and China.

For the 2030 posture and the next after that, the US will need to answer how much is enough. In the Cold War, the US had one sizing construct, then it shifted the focus to rogue states, with a laissez faire attitude towards Russia and China. Most of the hard questions about China and the sizing of US forces are still unanswered—the US, for example, has not decided whether it is ready to accept mutual vulnerability with China. Posture sizing is evolving in uncertain ways, but one of the least fitting element of US posture is strategic thought. The US is faced with a much more

complex environment with a much more complex problem—strategic thought was done in Russia and China, they built institutions, and gained the expertise on the US and its allies. The US also needs to invest in its institutions and expertise.

Another area that has not received enough attention in the analytical community is conventional deterrence. There is a lot of emphasis on intercontinental weapons, while the area of conventional warfare is underthought. Due to the growing threat of grey zone conflicts, the US needs to think about constructing effective deterrence in the non-nuclear domains. The DoD should form an institutional body that deals with integrating these conventional capabilities and their C2 aspects. At the NSC level, the US should make an attempt to address this grey zone challenge with a whole of government approach that would include the treasury and other departments. The US and its allies need better preparedness for the early stages of conventional war. The Russians have thought about the non-nuclear problem set for about 10 years, and they developed a holistic approach that includes the potential use of cyber and space capabilities in the early stages of war. Since inadvertent escalation is likely to emerge from a conventional conflict, the US should try to structurally minimize it.

Besides, the US will also need new thinking about arms control to manage some of the complexities of competition. The strategic community cannot just put arms control to the side. Analysts need to ask the hard questions, even if they conclude that arms control is not realistic. The US has an extraordinary safety and security record in comparison to the level of risks, and it also managed to avoid nuclear war in the last 75 years. Elements of US posture include deterrence strategy, planning and targeting, signaling, hedging, modernization, assurances, and declaratory policy. Today, most of these elements may not get the best grades, but they are still mostly fit for purpose. Continuing the modernization of forces and the developments of this posture will require legislative and public support. An important lesson of the past is that in order to get the American people and Congress behind US posture, a comprehensive approach will be needed. This comprehensive approach should include defenses, arms control, global threat reduction, nuclear terrorism, and non-proliferation. A successful posture needs to wrap all of these pieces in a larger strategy. At the moment, that comprehensive picture is missing.

From a methodological perspective, better net assessment of the US position relative to Russia and China in 2030 and beyond will require better tools. This should be based on a platform of wargaming, modeling, simulating, and TTX, running a number of different scenarios. Whenever possible, red teaming should be part of US intelligence assessment and focus on all capabilities, not just one single set of capability. Red teaming should also be expanded into the interagency process. Having multiple blue teams would also be useful, although it is a giant undertaking. Direct engagement with adversaries and strategic stability talks are crucial—the US needs to listen to the Russian and Chinese concerns and keep the communication channels open. The difficulty for analysts is threading the needle between mirror imaging and analyzing behavior based on Russia's and China's past actions and how they have reacted in previous conflicts. The US needs to invest more in adversary analytics, language skills and human assets, because machine capabilities are not enough in themselves. Analytical work and wargaming should also look at strategic surprise, especially in relation to the vulnerabilities of the NC2 systems. The US has to be prepared for surprises arising from new technological breakthroughs by its adversaries, and potential surprises due to novel concepts that Russia or China might implement

in the future. The strategic community has to be on guard and think a little bit more vibrantly. Doing more wargames is very important, as well as looking back at the past and see what surprised US leaders and how they extrapolated.



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