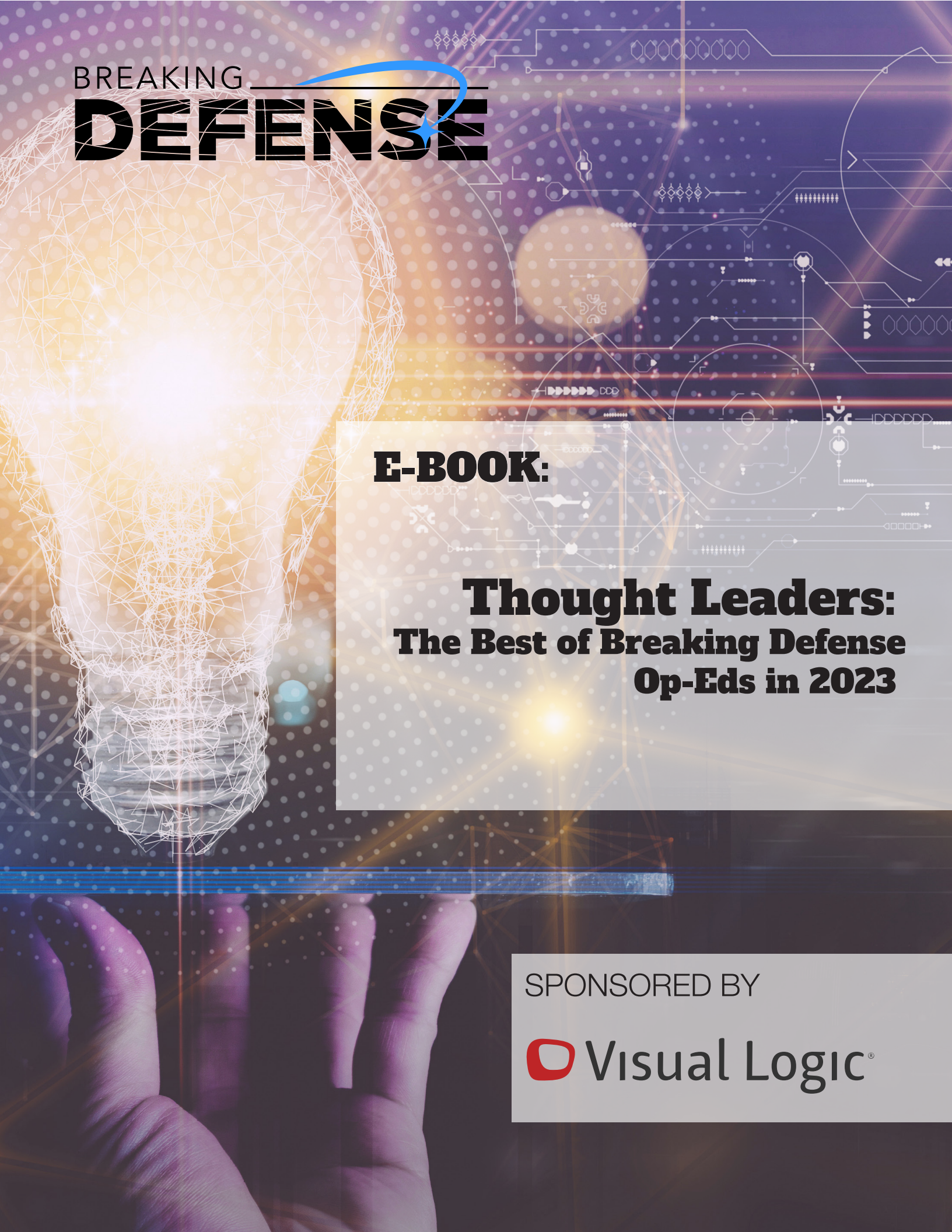

BREAKING DEFENSE

E-BOOK:

Thought Leaders:
The Best of Breaking Defense Op-Eds in 2023

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Editor's Note

In many ways, 2023 was a year of chaos. Chaos in Congress, with former Speaker of the House Kevin McCarthy barely getting the job, then losing it nine months later. Chaos with the budget, which, as of this writing, Congress still has not settled on. Chaos geopolitically, with the Ukraine war continuing to rage and then, in October, the assault by Hamas on Israel leading to another major conflict.

So it's not a surprise that the defense community had a lot of thoughts to share throughout the year. And share they did: In 2023, Breaking Defense published over 100 op-eds and analysis pieces. What you're reading now is our attempt to collect just some of those in one place.

Now to try and capture everything we published in a single eBook would be unwieldy, so unfortunately a lot of great work didn't make it into this collection. We put an emphasis on key newsmakers who decided to share their thoughts with our readership, as well as pieces that are less about news-of-the-day — the many excellent analysis about what weapons to send to Ukraine, or the deep dives into various budget proposals put forth in 2023 — in favor of long-term discussions.

The good news is that every opinion piece we published continues to live online, and can be found by clicking right here. And of course, in 2024, we expect to keep publishing the best analysis and opinion pieces in the defense sector. Make sure to check BreakingDefense.com for every piece, along with our usual expert reporting.

Thanks for reading,

Aaron Mehta

Editor in Chief, Breaking Defense

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BREAKING DEFENSE

Rep. Joe Courtney: To make AUKUS work, Congress should look to the past

The incoming Ranking Member of the Subcommittee on Seapower and Projection Forces lays out his vision for how to make AUKUS succeed in this new op-ed.

U.S. Congressman Joe Courtney (CT-2) speaks at the Tolling of the Boats ceremony held at the United States Submarine Force Library and Museum. (U.S. Navy/Tristan B. Lotz/Released)

By REP. JOE COURTNEY - January 11, 2023

At the start of 2023, Breaking Defense broke news of a letter from the leaders of the Senate Armed Services Committee to President Joe Biden raising concerns about how the AUKUS agreement could impact US naval needs. It became big news down under, where Australian Prime Minister Anthony Albanese faced intense questions locally about the report. Days later, Rep. Joe Courtney of Connecticut, one of the leading voices in Congress when it comes to seapower, wrote this op-ed offering his support for AUKUS and arguing there is a way to ensure Australia receives the capabilities it needs without leaving America's navy high and dry.

On Sept. 15, 2021, the governments of Australia, the United Kingdom and the United States announced a startling new security agreement to share their most advanced defense technologies in order to dramatically bolster deterrence and counter coercive behavior in the Indo-Pacific region. Nothing is more eye-catching than the centerpiece of the AUKUS agreement: providing "conventionally armed, nuclear powered submarine capability at the earliest possible date" for the Australian Navy.

David Ignatius, the longtime journalist covering foreign policy at the Washington Post, described AUKUS as "the most important strategic move in decades" — and from where I sit, I fully agree. The logic behind the endeavor is inescapable. Australia needs to recapitalize its submarine fleet, and a nuclear-powered submarine provides sustained stealth in a way that a new class of diesel electric submarines cannot achieve. Meanwhile, the agreement brings America's relationship with Australia to new heights while also providing logistical support for the US Navy's own fleet of nuclear-powered subs.

That strategic judgement of the agreement's value, though, is the easy part. The logistical execution of AUKUS — which requires sharing of technology, naval training, and a complex industrial base all "at the earliest possible date" — is where the capability of the three countries will be tested.

The principals who negotiated this deal understood at the outset that developing such a plan would take time and intense planning. No details of a construction plan will be released until after a trilateral, 18-month, highly classified Working Group fleshes out this joint enterprise. Presumably, the Working Group will make its "reveal" in March 2023. There has been an immense amount of speculation and curiosity over what, when, and where the work will be distributed, but the group has maintained an impressively tight hold on deliberations. Despite all the external handwringing as we approach the completion of the consultation period, its clear that the principals are committed to formulating a workable plan for Australian submarine construction.

For the US Congress and the parliaments of Australia and the UK, this AUKUS hiatus does not mean that our work is just on standby. Regardless of the specifics of the Working Group Plan, the need to remove legal impediments to advanced nuclear technology-sharing between the three countries is screaming out for action. Even among the most trusted of allies, the strict regime of existing export controls, which are far-reaching in their scope, could decimate the "earliest possible date" edict in AUKUS, which is foundational to its efficacy.

To understand this point, legislators from all three nations should look to the last time the US government shared the "Crown Jewels" of its nuclear technology in the 1950s with none other than the UK.

It may be surprising for many to learn that in 1946, the US Congress passed and Harry Truman signed into law the Atomic Energy Act, also known as the McMahon Act, which prohibited the sharing of atomic energy technology with any country, including Great Britain, "on pain of imprisonment or death." The McMahon Act's proximity to the shock and awe of Hiroshima and Nagasaki explains the political desire to drastically limit proliferation of nuclear weapons, but from the time of its passage, Prime Ministers Winston Churchill and Harold McMillan relentlessly complained about the Act and advocated for its reversal, including in a one-on-one between Churchill and Connecticut Sen. Brien McMahon, the sponsor of the legislation.

As time went on and the Soviet Union ended the US atomic monopoly in the 1950s, the Eisenhower Administration advocated for relaxing the law to permit the US "special relationship" with the UK to share nuclear secrets in the realm of both weapons and naval propulsion. Finally, Congress amended the McMahon Act in 1954 and then again in 1958 to allow the British Navy access to US designed and built nuclear naval reactors.

It was not long after that US Adm. Hyman Rickover, the head of Naval Reactors, cut through the impasse and simply sent a US-built submarine reactor to the Royal Navy to do as it wished. Since then, the two navies and their respective shipbuilders have successfully collaborated for decades on construction of new classes of submarines.

In 2022, the regime of export controls for modern attack submarines is more extensive than the one-statute impediment of the 1950s. Today, the amalgamation of statutes and bureaucracy that has grown up, known as ITAR, poses a daunting task for the US Congress to amend. There is multi-agency jurisdiction — Defense, State, and Commerce — as well as layers of both federal statutes and administrative rules to fix. For the Parliaments of the UK and Australia, there is also a need to make sure that their in-country end users that will be part of submarine design and production are required by law to protect sensitive technology. AUKUS's intent is to tightly integrate naval reactor propulsion among three close nations, not to become a backdoor for proliferation.

This is a big "to-do" list that will require bipartisan commitment and discipline from all three governments, particularly their legislative bodies. We can't sit around and wait for issues to appear — now is the time for my colleagues in the US and our international partners to work through these challenges. As former Chairman of the House Armed Services Subcommittee on Seapower and Projection Forces, and as the sponsor of the first-ever AUKUS related legislation in the 2022 NDAA, legislative reform to ITAR will be a top priority of mine in the new Congress. Likeminded colleagues in the Friends of Australia Caucus, particularly caucus co-chair and senior House Armed Services Committee member Congressman Mike Gallagher (R-WI), are also determined to advance this issue.

In the 1950s, goodwill between allies accomplished this task. That example should motivate and inspire all AUKUS partners to do the same.

Congressman Courtney represents Connecticut's 2nd Congressional District. He is a senior member of the House Armed Services Committee, and is the incoming Ranking Member of the Subcommittee on Seapower and Projection Forces

Thornberry: 4 points to understand in order to meet America's global challenges

The "American spirit of adaptability that has played such a central role in our past success is even more necessary today if we are to remain a globally competitive country and economy," writes former House Armed Services Chairman Mac Thornberry.

Then-U.S. Rep. Mac Thornberry (R-TX) speaks at a press conference on Capitol Hill on June 30, 2020 in Washington, DC. (Tasos Katopodis/Getty Images)

By MAC THORNBERRY - March 08, 2023

Mac Thornberry spent 26 years as a member of the House of Representatives, including four years as chairman of the House Armed Services Committee, garnering respect from both sides of the aisle. In the following op-ed, Thornberry laid out what he described as four key points American leaders need to acknowledge if the country is to stay dominant on the world stage.

"The more things change, the more they stay the same," wrote the French journalist and novelist Jean-Baptiste Karr more than a century and a half ago. That statement is profoundly true when applied to the many challenges faced by the United States since our founding. Our past trials have included wars, economic depressions, and social upheavals. Through them all, however, a defining characteristic of the United States has been adaptability, which has given us the resiliency needed to withstand the storms of history.

Our ability to adapt is grounded in our Constitution and in our free market system. Those freedoms and the practical, innovative problem-solving abilities that they have unleashed in the American people enabled us to persevere and, since the end of World War II, to lead the world in its greatest period of human flourishing ever.

Today, America is again facing a plethora of challenges, and there are doubts about whether we are up to the moment. Some argue that decline is inevitable. But that American spirit of adaptability that has played such a central role in our past success is even more necessary today if we are to remain a globally competitive country and economy. The players, the location, the technology, and the circumstances are different, but the qualities needed to surmount them are largely the same.

While there is plenty of uncertainty, there are four clear, key points about the near-future that need to be acknowledged.

First, we know that **the world will not get any calmer or quieter anytime soon.** China presents a more complicated challenge than any we have met before. Yet, we still must be able to deter or, if necessary, defeat the belligerence of Russia, as well as the threats posed by Iran, North Korea and terrorist organizations. While many are quick to dismiss the possibility of a new Cold War, a process of separation into opposing camps—one of authoritarianism and one of democracy—may well be occurring around the world. Only the U.S. can provide the leadership necessary for democracies to succeed.

Second, **the central battle in this world-wide struggle may well be in the cognitive space.** Technology now allows for instant communication, not only with one's own citizens but with populations around the world. Authoritarian regimes are quick to use technology to block outside voices, as well as inside voices of dissent. Democracies have to tread carefully to remain consistent with our laws and values. There is ample evidence to show, however, that Russia, China, and others use their resources to create and exploit political differences within the United States and Europe. They also promote messages that support their policies and criticize those which run counter to their interests. Of course, a nation and economy subject to a relentless barrage of falsehoods cannot make good decisions. Even more significantly, if authoritarians can undermine the will of democratic populations to resist, they may triumph without ever firing a shot.

Third, **the infrastructure on which we all depend, both domestically and globally, is at increasing risk.** At home, we are still playing catchup for decades of neglect in building and modernizing infrastructure. Both neglect and malicious cyber-attacks reveal vulnerabilities in everything from the electric grid and fuel pipelines to air traffic control and water treatment. And global economic integration means we are dependent on those outside our borders for much, as became evident during the COVID pandemic. Our economic competitiveness, as well as our safety and security, depend on a crash effort to understand our exposure and place safeguards and reduce exposures where necessary.

Finally, **the rise of protectionism and populist nationalism risks isolationism in both the economic and political spheres.** When it comes to the economy, history has proven isolationism as one of the biggest impediments to economic development, innovation, productivity and, ultimately, a country's competitive status. Isolationism also contributes to rising extremism and reduced trust in a nation's political institutions. We too easily forget our own history in which isolationist sentiment after World War I helped bring about World War II, the greatest calamity in human history measured by total deaths.

Taking meaningful action to address these and other conditions requires a serious commitment by the United States. Clearly, we should not seek to imitate China but should build upon our own considerable strengths. So while China pursues a 21st century version of mercantilism, an approach with a deep history of failures, our free market economic system and democratic institutions remain the envy of the world and give us a significant advantage.

While we must defend our companies and industries from unfair practices, especially from our adversaries, we must resist excessive government intervention, repeating the past errors of others. Those approaches to industrial policy only weaken our ability to adapt. We must strongly counter the forces—domestic or international—that strive to weaken trust in our government and ourselves. And we must resist the temptations of nativism with an immigration policy that works and contributes to our national strength and well-being.

We must also shore up our weaknesses. Our educational system lags behind many other countries, both allies and adversaries. Our short-term focus in both government and financial systems undermine our ability to invest for the long run. National leaders who focus more on attacking political adversaries than on offering a positive, hopeful vision for the future fuel our domestic tensions. The siloed nature of our government, lack of leadership, and short-term focus combine to create an aversion to innovation, out-of-the-box thinking, and compromise. On the other hand, partnerships, whether between government and business or among allied nations, offer enormous potential.

Global competition in all domains is as heated as it has ever been. Whether from our adversaries or from our friends, the competition for resources, human and physical, will only get tougher over the coming years. America's historic resiliency stemming from our adaptability in a challenging and ever-changing world must remain strong if we are to meet our obligations at home and abroad and provide the leadership necessary for future success.

The Honorable Mac Thornberry is a Board of Regents member at the Potomac Institute for Policy Studies, supporting their Global Competition Project. Mac is a former chairman of the House Armed Services Committee, and was also a member of the House Intelligence Committee for more than a decade.

America needs to grow its capacity to produce weapons. Here's four steps to do it.

Former Pentagon official Jerry McGinn has a prescription for America's production problems.

A row of Guided Bomb Unit 32s lie on a munitions assembly conveyer at Langley Air Force Base, Va., March 5, 2013. (U.S. Air Force/Kayla Newman)

By JERRY MCGINN - March 17, 2023

A major through-line for 2023 was concerns from NATO nations that production rates on weapons and munitions are not keeping pace with what is being expended in Ukraine. Everyone, it seemed, agreed more needs to be done, but there were few concrete proposals. Jerry McGinn, a former DoD official and acquisition expert, offered his thoughts in March on how to proceed.

American military support has been crucial to Ukraine's thus far successful efforts to withstand the unjust military invasion Russia launched a year ago. The rapid consumption and difficulties ramping up production of munitions such as Javelins, Stingers, and HIMARS are a wakeup call, however. If supporting Ukraine creates this much stress on our defense industrial base, it is frightening to think about the impact of an extended military campaign in the Taiwan Straits, let alone conflicts on multiple fronts.

There are roughly 200,000 vendors who provide systems, supplies, parts, and manufacturing for Department of Defense programs. A very small number of those — roughly 50 — are prime contractors who deliver the systems used by our forces as well as our allies and partners such as Ukraine. Given the specialized nature of military equipment and the monopsony marketplace that is government contracting, the number of primes drops even further when you look at individual market areas, such as shipbuilding, ground vehicles, or precision munitions, a market status that has remained fairly stable over the past two decades. With essentially one customer for many military systems, it requires active industry and government management to ensure that specific industrial base sectors maintain an adequate number of providers to support defense needs.

Beyond the primes, the vast majority of vendors are subcontractors. Diminishing manufacturing sources and parts obsolescence, shortages, and delays are key elements on the critical path to quickly scaling up production and replenishing supplies provided to Ukraine. Ninety eight percent of second-tier and third-tier suppliers in the munitions industrial base, for example, are single or sole source. These supply chain challenges are prevalent throughout the defense industrial base and are a reflection of the highly specialized nature of defense production.

Despite these shortcomings, our industrial base develops and fields the best military systems in the world. We ultimately get the defense industrial base we buy, so additional resources are part of the solution. However, building the industrial base resilience necessary to counter threats from Russia, China, and beyond requires a greater focus on capacity. Here are four steps to help get us moving in that direction.

Step One: Produce More

The experience in Ukraine has demonstrated that we clearly do not produce enough materiel for a sustained fight. Missile and munitions production have rightly received a lot of attention in recent months, but the lack of stability in munitions funding over time has been quite stark.

Our analysis of 80 missile and ammunition accounts over 20 years found that a particular munition's actual funding is likely to swing more than 50% year-over-year. Not surprisingly, this engenders high levels of uncertainty and instability for the government program managers overseeing and the companies producing these systems. In Ukraine's wake, DoD and Congress have moved quickly to establish multi-year procurement for munitions and increase production capacity, but it will take years to significantly ramp up production and replenish stockpiles.

The need to produce more goes way beyond munitions. Wargames of a potential US-China conflict over Taiwan have consistently resulted in massive losses of planes and ships that the production rates we have become used to in the last 30 years could not come close to matching. We can and should increase production rates of existing programs to address the potential wartime contingencies facing us.

We can also multiply our capacity with commercial technology. Commercial and tactical drones such as Switchblade and Phoenix Ghost have started to proliferate in Ukraine. These capabilities are dramatically less expensive and more quickly resupplied than advanced military systems. Ukraine has in many ways become a testing ground for former Defense Innovation Unit (DIU) Director Mike Brown's "fast follower" approach to rapidly incorporate commercial technology into DoD. US military leaders have clearly taken notice and are actively exploring ways to deploy commercially-derived unmanned systems in collaboration with major platforms, gaining warfighting capacity in theater at much greater speed and lower cost.

Step Two: Buy Differently

The need for greater capacity also requires that we rethink how we buy major systems. Our acquisition system is structured to develop the most capable systems in the world at the lowest possible risk. The defense acquisition system has incredibly detailed and thorough processes to ensure competition and fairness. From the development of requirements through source selection, acquisition officials work diligently to get things right. This takes time, however, which lengthens the period it takes to deliver capabilities to the warfighter into decades. The way the Department plans, programs, and budgets reinforces this deliberate and timely process.

We don't have that time anymore.

Recent calls for the return to World War II's arsenal for democracy with Bill Knudsen and his dollar-a-year-men, Liberty Ships, and massive industrial mobilization are inspiring, but the more recent effort to develop and field the Mine Resistant Ambush Protected (MRAP) vehicle may be a more apt approach for the near term. Former Secretary of Defense Robert Gates drove a radically different acquisition approach in the face of dramatically escalating casualties and deaths of American soldiers in Iraq and Afghanistan during the late 2000's due to improvised explosive devices (IEDs). With an extremely limited set of requirements focused on improving soldier survivability, the department gave industry multiple opportunities to rapidly develop and deploy numerous MRAP versions over a short period of time.

This approach focused on outcomes, rather than process, helped save countless lives and involved multiple companies in the delivery of critical capabilities to the warfighter. DoD can take a similar approach today by streamlining time-consuming requirements processes and even selecting multiple sources for production in key programs. If the Army opted to select two systems for production at the end of Optionally Manned Fighting Vehicle's prototyping phase, for example, the service could continue to drive innovation and competition as well as gain industrial base capacity throughout the life of the program. More broadly, it is certainly time to reconsider the merits of this approach, most prominently championed by the late Jacques Gansler in the F-35 alternative engine program debate.

Adapting the Planning, Programming, Budgeting, and Execution (PPBE) process is also essential to increase speed and build capacity. Commercial industry has long ago moved on from the linear processes undergirding PPBE to approaches focused on portfolio management and agile acquisition. The PPBE Reform Commission is actively examining ways to incorporate these kinds of methods and will hopefully spur increased innovation, transparency, and collaboration between the Department and Congress, leading to more execution flexibility and speed in the fielding of systems.

Step Three: Strengthen Supply Chains

Within the lower tiers of the defense industrial base, we can increase capacity by focusing on strategies like second sourcing to reduce bottlenecks in the manufacturing process. High requalification costs have traditionally stymied many of these efforts, but the benefits can be substantial. For example, second sourcing the A-10's depleted uranium ammunition resulted in an 80 percent reduction compared to the cost estimate. Program offices and industry partners could cost-share targeted second-sourcing initiatives to help increase capacity in critical areas.

Tackling obsolescence is another way to increase capacity. Obsolescence issues impact all the munitions being shipped to Ukraine and virtually all DoD systems, and the Department spends $2.6 billion addressing it each year, according a 2016 Institute for Defense Analyses study. Planned technology refreshes and, potentially, additive manufacturing could help mitigate these challenges.

We are making progress in some areas, though. Prior experience during the COVID-19 pandemic and multiple reviews of the defense industrial base have led to significant government-led investments to re-shore capabilities such as rare earth processing, specialty chemicals and materials, microelectronics, and numerous other areas to help increase capacity in long-lead areas. These are very welcome, but commercialization strategies will be essential to help these industries maintain and grow over time.

Step Four: Adopt A 'Build Allied' Approach

Finally, we can also expand our defense industrial base with a little help from our friends. NATO and other allies have provided equipment to Ukraine, most allies buy U.S. defense systems, and many also produce major parts or sub-systems that are incorporated into platforms principally delivered by U.S. primes. Three current examples of this industrial collaboration include the significant allied contributions to the F-35 Lightning II fighter program, the long-running NATO Sea Sparrow Consortium, and the Norwegian company Nammo's somewhat controversial development of a second engine source for the Advanced Medium-Range Air-to-Air Missile.

The National Defense Strategy underscores the imperative of increasing cooperation with allies and partners to build "enduring advantages" in the joint force. DoD leaders such as Under Secretary for Acquisition and Sustainment Dr. Bill LaPlante have called for an increase in co-production, licensed production, and cooperative programs. Fortunately, we have numerous venues such as the National Technology Industrial Base (NTIB), the Australia, United Kingdom, and United States (AUKUS) partnership, and the newly minted NATO Defense Innovation Accelerator for the North Atlantic (DIANA) initiative.

The key, however, is to use these vehicles to drive robust industrial collaboration. The NTIB has clearly struggled in that regard; AUKUS's programmatic focus is more promising but has also hit headwinds. Whatever the fora, changes in contracting approaches and incentive structures are important components of the solution, but focused efforts around technology transfer are also essential. The latter will require some focused export control reforms to deliver and scale the robust "Build Allied" approach critical for the future.

There are no overnight solutions, but we must have more capacity to achieve the industrial base resilience necessary for tomorrow's fight in China, Europe, or elsewhere. Getting there requires a multi-faceted effort bringing out the best of DoD, allies and partners, and industry. Our experience since COVID and supporting Ukraine has helped lay the foundation for this unleashing of the defense industrial base. Now let's get after it.

Jerry McGinn, Ph.D. is the Executive Director of the Greg and Camille Baroni Center for Government Contracting in George Mason University's School of Business and a former senior defense acquisition official.

French Land Forces chief: How France's army is transforming for the modern era

In this op-ed, Lt. Gen. Bertrand Toujouse lays out the modernization plans for his service, as France looks towards the era of Great Power Competition.

Lt. Gen. Bertrand Toujouse took over as commander of the French Land Forces in September 2022. (Courtesy French land forces)

By LT. GEN. BERTRAND TOUJOUSE - May 25, 2023

Since the turn of the century, French land forces have focused heavily on the counter-terrorism mission. But with the focus in Europe turning to countering Russia once more, the French military finds itself having to twist towards a new goal. Lt. Gen. Bertrand Toujouse, the head of the French land forces, visited Washington in May for discussions on that very topic. Ahead of his arrival, he penned the following analysis for Breaking Defense.

As the war in Ukraine continues to rage, the European public is as acutely aware as any time since the end of the Cold War that conflict could break out in its home countries. But while Russia's invasion was a surprise, the concept of having to wage large-scale conflict on European soil was one that the French army has been preparing for, and transitioning towards, for several years.

For the French forces, this change is a revolution of its own kind. France used to foster during the Cold War a "corps de bataille mécanisé" in Europe, but even then, French soldiers' operational experience was much more about expeditionary campaigns, starting with Indochina and culminating with the "war against terrorism" in the 2000s.

Those commitments have given to the French military an undisputable expertise in small, light and highly effective operations, like in Zaire in 1978 or Mali in 2013. However, today's threats, aside from very extremist organizations, are able to go head-to-head with the largest military units and bring comparable capacities to the fight.

And yet: the French forces cannot dedicate all their energy to resuscitate a 1980-style "Big Army" tailored for Europe, with plenty of conscripts and a bunch of paratroopers for overseas interventions. France faces today a variety of competitors not only in Europe but also all over the world, in the Atlantic, in the Pacific and in Africa, where the Russian-backed Wagner Group is particularly active.

Therefore, France's Grand Strategy is to weigh a "power of balance," with hard capacities in support of a multilateral approach and spotted military interventions. The French army's transformation, now fully underway, answers that ambition.

French territories are scattered throughout the globe, in the Atlantic, the Indian Ocean, and the Pacific. This makes France a neighboring country to Brazil, Madagascar, Australia, China and, through closeness to Puerto Rico, the US. Africa has had a special place in French hearts for historical reasons but the French military footprint there is decreasing and evolving towards advising and support, in order to fit exactly with African nations' cooperation requests. However, the recent crisis in Sudan shows that "touch and go" operations are still required as necessary.

This means the French military needs to be ready to intervene in any type of operations, from open war to hybrid and indirect actions. Readiness, polyvalence, and strategic autonomy ground this posture, with the ability to intervene immediately when needed, but effective power also requires getting partners on board when "high" intensity turns into "long" intensity.

Gen. André Beaufre pointed out that nuclear deterrence made unlikely a total war, paving the way to a kind of "paix-guerre" era, in which peace and war are no more sequential but simultaneous, although never totally one or the other. This sounds very accurate in today's context of nuclear proliferation, power competition and lurking terrorist threat (7,000 French Soldiers are deployed each day on national soil to prevent any new attack, with 3,000 on alert). And of course, French land forces understand they operate under the nuclear umbrella, and that when fighting another nuclear nation they will be part of a nuclear dialogue, not apart from it.

Hence, the problem is not about mass vs technology, but about coherence. Trying to build up a force by choosing between quality and quantity simply does not work for the mix of low-intensity conflict and high-intensity, potentially nuclear, war that the French land forces have to prepare for. Hence, the dilemma for the French Army is to keep the right balance between expeditionary and conventional warfare, tactical effectiveness and strategic weight, in a long-term perspective.

So, what is the French army doing to prepare for the future? Wide-ranging changes are coming, just some of which include:

- The 2024-2030 military programming law will support an unprecedented 36 percent increase in the army's budget, including up to €18 billion in equipment and stocks.
- Land forces will remain around 77,000 Soldiers, but the reserve will double and some units will transform to develop new capacities and consolidate service support. The operational force will keep the same structure: one Corps HQ, two combat divisions, and six combined-arms brigades (French combined-arms brigades are slightly bigger than most of NATO's, with about 5,000 active duty soldiers and full combined-arms abilities). Three other specialist brigades — the aviation brigade, the French-German brigade and the Special Force brigade — will also be supported.
- The army will this year stand up a Combat Future's command, to keep up the pace with innovation and help coordinate acquisition programs with tomorrow's needs.
- The service will also create a specific command for deep operations, in support of the Corps and the two combat divisions, able to generate capacities to accelerate the kill-chain by systemizing intelligence, deep fires and aviation.
- Responding to NATO's force requirement, the French army is able to deploy up to its Corps HQ one division with two brigades, including enablers, the aviation brigade and a Special Forces task force. For an immediate response, a full brigade with four combined-arms battlegroups is permanently under alert.
- Existing training facilities are being enlarged and modernized with simulation, especially for command post exercises and regimental/brigade level live exercises.
- A major focus is on the UAV fleet, where starting in 2025, more than 3,500 drone systems of all types will be distributed in the forces. The goal is to develop a polyvalent drone capability, with diversified kits (intelligence, communications etc.). For the army, SDT Patroller systems are currently arriving, with a total order of 28. They will considerably increase detection and remote action abilities.
- As for deep fires, the Délégation générale de l'Armement (DGA : French Defense Acquisition Agency) is working with the Army on a system that will complement/replace the M270 MLRS ("LRU" in French), and is looking forward to acquiring loitering munitions.
- The 155mm CAESAR artillery system, which has proved its high efficiency in Ukraine but also against ISIS in Iraq, is being modernized, and the LECLERC tank is about to be renovated through the TITAN program.
- The real game changer for movement and maneuver is the communication system, called "SICS." It takes advantage of connectivity and digitalization to enable units to develop "collaborative combat" and take advantage of chaos in battle by sharing quicker blue and red pictures and striking solutions. Put more simply, SICS is a cognitive tool to speed up decisions and enable mission command and initiative.

A broader, but still vital, increased effort will come in the realm of training. This year France led a large-scale joint exercise, ORION, the biggest in 30 years for French forces, regrouping thousands of Land, Navy and Air troops — including British, US, German, Belgian, Greek, Italian, Dutch and Spanish forces — with France acting as a framework nation at the Corps level. ORION has been a great incubator for technical but also human interoperability.

In the end, combat will remain a human matter, where "esprit de corps" and the will to fight together make the difference, whatever the odds and the means available. What you need is reliable units that can operate together. No alliance can work without that. That is why France is developing its new force deployment system.

As of this summer, each division will be assigned to a specific area of responsibility for a fixed period. They will link up with their local partners to plan and prepare for any kind of scenario, drill plans and train procedures together, exchange units, and gain a deep understanding of how the partners operate. This won't just be in Europe, but also in the key regions where France has geopolitical interests.

The French Land forces are experiencing one of the most profound transformations, if not refoundations, in decades. Still, transformation takes time — if nothing else, the acquisition of new systems moves at its own pace — and needs to be done while achieving today's missions. Again, the challenge here is to find the right balance between ongoing operations and getting ready for the next war.

Perhaps it is ironic for an army officer to say this, but it is all about building while flying. We must plan while executing, a question of coherence and pragmatism.

Lt. Gen. Bertrand Toujouse took command of the French Land Forces in September 2022. Previously, he was the commanding general of the French SOCOM, culminating his time in the Special Forces (he was the CO of the Special Forces Long Range Reconnaissance Regiment from 2007 to 2009). He also served in the Armor as a company commander (LECLERC tanks) from 1995 to 1997. He has developed a strong experience in Finance (head of the finance cell for Army acquisitions than procurement desk in the Joint staff), intelligence (Deputy Director of the French Defense Intelligence Agency) and international relationships (he graduated from the Spanish war college and was in charge of EU, NATO and Euratlantic issues at the French Joint Staff). His operational deployments include Afghanistan, former Yougoslavia and the Levant.

Wittman: Why manned-unmanned teaming could be the Fourth Offset for America's military

In an exclusive op-ed, Rep. Rob Wittman, R-VA., the Vice Chairman of the HASC and Chairman of the Tactical Air and Land Forces Subcommittee, lays out why he thinks efforts like the Air Force's Collaborative Combat Aircraft program could be the future of warfare.

U.S. Rep. Rob Wittman (R-VA) speaks during the 400th anniversary celebration of the first representative legislative assembly at Jamestown on July 30, 2019 in Jamestown, Virginia. (Zach Gibson/Getty Images)

By REP. ROB WITTMAN - May 30, 2023

Rep. Rob Wittman, R-Va., is a long-time member of the House Armed Services Committee. Although best known for his expertise in naval issues, at the start of 2023 Wittman was appointed Vice Chairman of the HASC and Chairman of the Tactical Air and Land Forces Subcommittee. In the op-ed below, he called on his colleagues in Congress to support the "promising opportunity" in Air Force and Navy programs to team drones with piloted fighters.

In the early 2000s, Congress tracked a rising discussion in defense circles about the extent to which a revolution in the character of war — driven by technological advancement — would shape how war is fought in the future. By the early 2010s, former Deputy Secretary of Defense Robert Work introduced the concept of the "third offset" strategy, urging the US military to embrace technology with military applications. Fast forward to today, and we stand on the precipice of a fourth offset — one that has the potential to reshape the very theory of battle, particularly in aviation.

The first offset was the use of nuclear weapons to counter Soviet power, and the second offset the development of precision weapons to compensate for US numerical inferiority in the American arsenal. Work's third offset focused on leveraging advanced technologies — like artificial intelligence and unmanned systems — to counter the technological advancements of China and Russia.

Since Congress recognizes that the US military will always require capability and capacity overmatch with its competitors, policymakers are well-served by focusing on efforts to enhance both. While the third offset was focused on securing technological superiority over adversaries, what must define this fourth offset is a fundamental shift in cost-imposition curves. It is not enough to rely on the technical superiority of a few exceptionally capable systems. The US needs a solution to offset China's industrial capacity, intellectual property theft, low weapons development costs, and more.

One promising opportunity lies in the form of manned-unmanned teaming, the kind of effort the US Air Force is pursuing under its Collaborative Combat Aircraft (CCA) program and the Navy is also experimenting with. I believe this concept will be critical to outpace competitors' rapidly advancing technological capabilities in domains that traditionally were distinct asymmetric advantages for the US, while remaining cost-effective.

The general idea of CCAs is not new. The concept of airborne manned-unmanned teaming entered the conversation in the context of existing platforms, like networking a number of drones with the F-35, F-22, or F/A-18. However, most of the important analyses of when and how front-line fighters will actually employ a combination of manned and unmanned systems are centered on the Air Force's and Navy's sixth-generation piloted aircraft programs.

However, NGAD programs for both services are not set to begin fielding to the services until the 2030s. I contend that drones teamed with other aircraft could and should solve much more near-term problems for the Air Force and the Navy. To this end, Air Force Secretary Frank Kendall has publicly acknowledged that CCA acquisition will begin as soon as late 2023 and arrive in the late 2020s, before NGAD fighters are fielded.

As Air Force Chief of Staff Gen. CQ Brown observed in February, "As you look at collaborative combat aircraft, it can be a sensor, it could be a shooter, it can be a jammer." That description solves a wide number of missions beyond air superiority – jamming capabilities and portend a CCA future that can also augment bombers, tankers, the new E-7 aircraft or enable a space based sensing layer.

Because the Air Force and Navy will likely receive these teaming drones before NGAD, the services and Congress should investigate options to leverage and field the drones along expedited timeframes. Thiscollab includes ensuring that our currently small fleets of advanced fourth-generation and existing fifth-generation fighters are capable of being networked with teams of drones and can seamlessly integrate with the additional sensor data that those drones can generate. We also need to leverage the interoperability provided by CCAs and the Navy's solution and expand their application beyond Air Force and Navy tactical fighter communities to include other critical enabling combat capabilities like big-winged ISR and mobility aircraft platforms. Congress is rightly considering opportunities to enhance the performance envelopes of existing platforms along these lines in the context of the FY24 National Defense Authorization Act, and I encourage my colleagues to support these efforts.

There are several challenges presented to Congress that the Air Force and Navy drone team programs might solve.

First, the US is on a trajectory that will see us lose both our lead in numerical capacity and capability when it comes to aircraft. The Air Force is rapidly attempting to divest its existing aircraft force structure. In its FY24 budget request, the Air Force proposed a divestment strategy that would decrease its Total Aircraft Inventory by 190 aircraft in one year—which is problematic by itself. We also know the service plans to divest 801 fighter aircraft from FY23-FY28, while only buying 345 new fighters over the same period.

The Navy is not much better, with a significant strike-fighter shortfall that will persist until at least 2031. The Navy has yet to achieve its planned production rate of 24 F-35C aircraft per year nor provide Congress a plan on how it will meet its statutory requirement of maintaining ten carrier air-wings to support the eventual 12 aircraft carrier force structure.

Adding a pair of drones for every fighter — if not more, as the technology develops — is an obvious way to ensure mass remains available for the Pentagon.

Second, the Air Force and the Navy are on the wrong side of the cost-imposition curve. With the Air Force's sixth-generation Next Generation Air Dominance (NGAD) aircraft expected to cost "hundreds of millions apiece," the development and proliferation of adversary drones that could defeat — or at least challenge — one of the US military's fourth- or fifth-generation fighters at a much lower cost puts the service between a rock and a very expensive place.

Finally, much like the Department of the Navy is challenged with projecting air power at sea from the aircraft carrier and large-deck aviation amphibious ships, the Air Force is highly dependent on deeply vulnerable airfields across the Indo-Pacific that China can target in the event of a conflict. Generating survivable air power within China's anti-access/area denial circles is no easy task due to the PLA's long-range missiles and air defense systems. Having systems we are less afraid of losing would open up different concepts of operation in a conflict against China.

We must be forward-leaning to leverage emerging technologies effectively for defense purposes. Accelerating CCAs in the near-term is a clear opportunity to execute this objective and deliver value and increased lethality to our Airmen, Sailors, and Marines within relevant timeframes to enhance the capacity and capability of our fighter aircraft.

Welcome the Fourth Offset.

Rep. Rob Wittman (R-VA) is the Vice Chairman of the House Armed Services Committee and Chairman of the Tactical Air and Land Forces Subcommittee.

The Gray Rhino in space: US must update military requirements for satellite cyber defense

In this op-ed, former vice-chairman of the Joint Chiefs of Staff Sandy Winnefeld and former Air Force Materiel Command head Ellen Pawlikowski call for greater, more flexible cybersecurity options for space systems.

The Space Force is moving fast to develop a new set of missile warning/tracking satellites in MEO. (Graphic: Raytheon Technologies)

By SANDY WINNEFELD and ELLEN PAWLIKOWSKI - June 08, 2023

When it comes to the security of space assets, there is widespread agreement the greatest threat will come in the cyber domain. Few have as much hands-on knowledge of the subject as former vice-chairman of the Joint Chiefs of Staff Sandy Winnefeld and former Air Force Materiel Command head Ellen Pawlikowski. In this June op-ed, the two laid out their vision of how to introduce greater cyber resiliency for space.

Catastrophic events, such as the terrorist attacks of 9/11, sometimes arrive as so-called "black swans." These are events completely unforeseen, largely due to failures of imagination. Other times, catastrophes have arrived in the form of so-called "gray rhinos" — equally impactful events that were actually envisioned by leaders who failed to take preventive measures.

Inaction can be caused by analysis suggesting a low probability of the event, miscalculation of the resources necessary to address the threat, or simple denial that something so bad could actually occur. It doesn't take much to find a recent example: the government knew for a long time that a pandemic was a serious possibility, but nonetheless was almost completely unprepared when COVID arrived. These gray rhinos stare us in the face, but we too often find it difficult to do anything about them in advance.

The potential for great power conflict is certainly on everyone's minds, and some would suggest that the US and its allies are not treating it as a gray rhino this time. While change in the military is maddingly slow due to outdated concepts and sclerotic legacy procurement systems, the military is beginning to shift its focus from counter-insurgency operations to more challenging near-peer competitors.

However, there is at least one element of such a conflict that persists as a gray rhino. It is highly likely that an adversary like China or Russia would use cyberattacks in addition to, or even in lieu of, kinetic attacks to neutralize the satellites on which we depend so much for communications, surveillance, and precision navigation and timing. Whether it involves intrusion in satellite networks' control links or tampering with the data they move, a successful attack would have a near-catastrophic impact on our ability to fight. Moreover, depending on the target set it would also have collateral effects on capabilities essential to everyday life in Western nations.

Some of our leaders already perceive this "gray rhino in space." Indo-Pacific Command's Adm. John Aquilino recently testified to Congress that "For counter-space, [China] is delivering capabilities that seek to deny use of our own space architecture despite their statements opposing the weaponization of space. [China's] cyber capabilities deliver both gray zone coercion and an enabling function to achieve decisive military advantage."

It's good that Aquilino is calling out the issue. But, speaking from one of our combined experiences as a military combatant commander and an acquisition leader, it's hard to change acquisition policy from the front lines. Clearly, we need to make cyber-attacks on friendly space networks—which soon will include tens of thousands of private satellites in addition to the government and commercial birds already in orbit—far more difficult for our adversaries.

Fortunately, relatively low-cost software solutions employing end-to-end encryption, zero-trust principles, and decentralized cryptographic-key management are available today and proven on terrestrial networks. In effect, by applying these capabilities to satellites and ground stations, flows of information and command links would be inherently secure rather than trying to provide lock-tight perimeter defense of the associated networks.

Doing it this way will ensure the military can work confidently with diverse, relatively untrusted networks. It would also mean the ability to recover quickly by shifting to other satellites when some are disabled and rekeying and restoring the software on satellites that are subject to cyber-attack. There would be no need to trust the "perimeter" or rely on manpower-intensive methods to detect an adversary's penetration of a network. The perimeter would be nearly irrelevant. (Full disclosure, both of us serve on the board of advisors of SpiderOak, a space cybersecurity company; however, other firms would be able to provide similar capabilities as well.)

The beauty of this approach to cyber defense is that it's relatively inexpensive and can be rapidly deployed. It imposes minimal space, weight, and power requirements on satellites that are becoming smaller all the time and have less capacity for bulky encryption systems. And vitally, as the weakest link can bring down a whole constellation the appropriate software can be retrofitted to ground systems and most satellites that are already aloft. This offers the ability to ensure that both new and most existing government and private space networks meet the same criteria for security.

Traditional approaches to defining cyber resiliency requirements for Defense Department systems have been problematic. Sometimes they are oversubscribed in technical requirement documents and become impossible to interpret and implement. At other times, zero-trust protocols are dropped due to the misconception they might drive unnecessary cost into a program. Yet the military has the opportunity to address this challenge today.

In summary, we need to introduce the requirement to implement zero-trust software design principles with decentralized encryption-key management on all Defense Department space systems and for all commercial systems integrated into the department's operations. The costs should be minimal as the implementation could be a software upload on most existing systems and straightforward incorporation of commercial products into the design of new systems.

This would shift thinking about cybersecurity from merely being an add-on feature for hardware and software to having it inculcated literally from the ground up in everything we do. It will speed up efforts by the military to leverage commercial space capabilities, thereby improving cyber resiliency for peacetime operations..

The benefit of a gray rhino is that we can all see it coming. Rather than letting it run over us, let's take the chance we have now to stop it in its tracks.

Adm. Sandy Winnefeld, USN (retired) was vice chairman of the Joint Chiefs of Staff and commander of Northern Command. Gen. Ellen Pawlikowski, USAF (retired) was the commander of Air Force Materiel Command and commander of the Space and Missile Systems Center.

How to leverage America's software advantage in the decisive decade

Michèle A. Flournoy and Wendy R. Anderson lay out their vision for how the Pentagon can speed software acquisition in this new op-ed.

Tech. Sgt. Michael Vandenbosch, 22nd Space Operations Squadron defensive counter-space operator, uses software to identify interference to a specific satellite at Schriever Air Force Base, Colorado, Dec. 16, 2019. (US Air Force photo by Airman 1st Class Jonathan Whitely)

By WENDY R. ANDERSON and MICHELE A. FLOURNOY - June 13, 2023

In April, the Atlantic Council released a major report outlining steps the Department of Defense and its partner agencies should take in order to speed up technology acquisition. Two of the authors of that report — Michèle A. Flournoy, a fixture in Pentagon circles, and former DoD official Wendy R. Anderson — went more into depth on how to get at the issues around software acquisition in this piece for Breaking Defense.

President Joe Biden's National Security Strategy calls the 2020s a "decisive decade" [PDF], which has been underscored by Russian aggression in Ukraine and increasing Chinese threats to Taiwan. Yet many major defense acquisition programs, necessary for US national security, are not slated to be delivered in the next ten years and each military service will continue to rely on legacy platforms well into the 2030s.

One way to bridge this gap is by adopting and leveraging innovative software across the Department of Defense. Software can help the US military unlock new capabilities from existing platforms while increasing the speed of trusted, secure decision making and the efficiency of resource allocation.

However, current acquisition systems designed for large and exquisite weapons systems are poorly optimized for software development or leveraging a "software as a service" model. And traditional DoD software acquisition is often painfully slow, disconnected from end-users, and outdated on arrival.

It's time to move beyond the legacy systems for how the Pentagon approaches software. Moving forward, DoD should put in place processes that allow the military to field software rapidly and continuously improve it with testing and user feedback. Software intensive systems should be updated rapidly to respond to operational needs and threats as they arise.

Some progress has been made in recent years. Both the Defense Innovation Board and Defense Science Board [PDF] have called for new approaches to software acquisition, which resulted in the creation of the software acquisition pathway. In 2022, Deputy Secretary of Defense Kathleen Hicks signed off on the Department of Defense Software Modernization Strategy, and the implementation plan was approved in March of this year. The software acquisition pathway works to overcome legacy bureaucratic impediments by integrating security testing into software development to enable rapid and iterative capability delivery.

But that has yet to be implemented in a meaningful way, and now is the time to capitalize on the current momentum to ensure that software adoption is scaled from a few dozen programs to every corner of the department.

This is one of the reasons why we are participating in the Atlantic Council's Commission on Defense Innovation Adoption. Last month, the Commission released its interim report highlighting 10 recommendations to accelerate the DoD's ability to adopt cutting-edge technology and deliver operational solutions to the warfighter with speed and at scale.

One of our first recommendations, expanding the role of the Defense Innovation Unit (DIU), has already been partly implemented. In April, Secretary of Defense Lloyd Austin elevated DIU to report directly to his office. This is a promising start. Our report recommends that DIU be properly resourced to serve as a central touchpoint for the effective adoption and scaling of commercial technology, including software, across DoD.

DIU can be an institutional advocate for using existing authorities, such as the software acquisition pathway, and a coordinating body to ensure that commercial firms know how to do business with the DoD. DIU should also work to ensure that the services and defense agencies are using best practices for buying commercial solutions and leveraging common technology where possible. At the same time, it is important to decrease the barriers that many software companies face when doing business with the DoD, including access to cloud environments, data rights agreements, and securing facility and staff clearances.

It is also crucial to tie operational experimentation to acquisition outcomes. Often promising technology is demonstrated in exercises but acquired late or not at all. We recommend Congress authorize funding for scaling operationally relevant and mature commercial technology demonstrated in major exercises, such as Rim of the Pacific and other joint and service-related exercises intended to test new and emerging technologies and software applications. This funding should be directed to a Program Executive Office or organization with personnel trained and incentivized to employ the more flexible acquisition authorities Congress has provided to enable more rapid production and fielding of promising solutions.

This funding should be matched with the use of loan guarantees through the new Office of Strategic Capital that can leverage private capital to support production and scaling. This recommendation could be used to dramatically accelerate the acquisition of key solutions to serious operational challenges faced by combatant commanders today.

Accelerating the department's ability to acquire innovative software is crucial to maintaining the United States' warfighting edge in this decade. The current challenge is not that the US private sector struggles with producing this technology, but that the DoD struggles to rapidly and effectively harness it. Time is running short as China aims to complete its military modernization program by 2027. Fortunately, software adoption is one area where substantial progress can be made quickly if Congressional and Defense leaders act now.

Wendy R. Anderson is Senior Vice President, Federal, National Security, at Palantir and former Chief of Staff to the late Secretary of Defense, Ash Carter. Michèle A. Flournoy is Co-Founder and Managing Partner of WestExec Advisors and the former Undersecretary of Defense of Policy.

Kendall: More rapid acquisition is within reach, if Congress acts

In his first op-ed since becoming secretary of the Air Force, Frank Kendall calls on Congress to support a DoD measure to speed new tech programs.

Air Force Secretary Frank Kendall. (Photo by Drew Angerer/Getty Images)

By FRANK KENDALL - June 26, 2023

Perhaps the biggest internal challenge facing the Pentagon is its struggle to move quickly enough to keep up with technological development and the breakneck evolution of the modern battlespace. In his first op-ed since assuming the title of secretary of the Air Force, Frank Kendall used Breaking Defense to make the case for a new legislative proposal he had authored that would give the services more flexibility to buy new technologies.

Over the last two years in my position as secretary of the Air Force, I have begun each of my eight Congressional budget posture hearings with a reference to Gen. Douglas MacArthur's warning that almost all military failures can be summed up in the words "too late." My obsession is that the Air Force and Space Force not be "too late" in acquiring the capability needed to remain the most capable military in the world.

Ever since I returned to government service in 2010 after a 15-year absence, I have been sounding alarms about China's military modernization program. There is no time to lose in responding to this challenge, and that is why the 2022 National Defense Strategy marked an historic shift by identifying China as the Defense Department's "pacing challenge." More than ever, we are hard at work deploying cutting-edge capabilities to our warfighters in the immediate term, and we are investing in the capabilities we'll need in the future to make sure that deterrence across the Indo-Pacific region and beyond remains as real and strong as it is today.

As part of these efforts, the DoD has submitted a legislative proposal to the Congress that would cut at least one year, and often two years or more, from the lead time to fielding new capabilities.

Kendall: More rapid acquisition is within reach, if Congress acts

During the first year of my tenure, the Department of the Air Force analyzed the operational problems that we had to solve to maintain our ability to project power in the Western Pacific. A year ago, that work produced well-supported recommendations for the initial set of capabilities needed to maintain our superiority. The recommendations were buttressed by analysis and included the funding streams needed to complete the necessary new product developments.

Included in the recommendations are a dozen "new start" programs. The Department of the Air Force then worked with the Office of the Secretary of Defense to finalize the fiscal year 2024 budget that was submitted in March 2023. Under the normal process, we will continue to wait for several more months, even if Congress passes authorization and appropriations on time.

The legislative proposal we have submitted would allow the Department to cut well over a year from this process, which currently requires formal congressional legislative approval before a "new start" program can be initiated. Under the Department's proposal we would have the authority to take the early and relatively inexpensive first steps down the path to fielding needed capabilities. Under our proposal, programs could not proceed beyond the early milestone known as preliminary design review. The activities we would conduct (generally in a competitive environment with industry) would include systems engineering, requirements definition, preliminary design, and modest risk reduction. All of this would be done without any contractual or budgetary commitments beyond the early preliminary design review milestone.

This is a tightly focused and targeted proposal. It builds on but does not replace other reforms enacted by the Congress. The Department's request is capped at $300 million per year, total. Service secretaries using this authority would be required to obtain approval from the secretary of defense and notify Congress within 15 days. This sum is adequate to conduct a small number of pilot programs to test out the concept, but not anywhere near enough for general application. This is a modest request and a genuine reform that I have argued was needed for decades.

Over my career in national security and defense new product development, one drumbeat has been constant: the process is too slow. This proposal represents low-hanging fruit that would eliminate one to two years from critically needed programs without any risk.

The United States needs a bigger toolkit to maintain our competitive advantages and strengthen stability and deterrence. When we discover innovative applications of technology that will give us a significant military advantage, we need to act.

The teams we assembled to address our highest priority operational challenges did great work, and I'm very proud of them. However, their solutions were delivered over a year ago, and we are certain to have to wait at least months longer for new start authorizations and funding. With Congress' support, we can get on with that work, and hopefully avoid the disaster of being "too late" when we are truly needed.

Frank Kendall is Secretary, Department of the Air Force.

Seconds save lives, UX can be the differentiator

presented by Visual Logic

Reducing system complexity through user experience design saves time, training and lives.

Photo: Courtesy of Visual Logic.

By Breaking Defense - December 05, 2023

Visual Logic provides human-centered design consulting, better known as user experience (UX), for DoD contractors who are modernizing software applications or designing new ones. The company has extensive expertise in helping to improve usability and accelerating training for DoD systems like missile defense, ground robotics, counter UAS, and cybersecurity systems.

In this Q&A, we discuss how the military can better execute missions by improving UX with Visual Logic partners Andy Van Fleet and Kurt Vander Wiel.

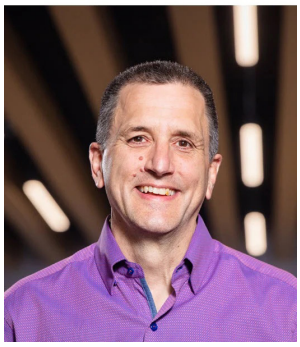
Breaking Defense: What's driving the need for better UX in the military?

Van Fleet: Systems have become quite complicated. We have great technology, which is constantly being improved, but quite often the end user has been left to deal with the complexity of these systems. The challenge now is to make systems technically advanced while taking complexity away from the end user. That reduces the amount of training that they have to go through and also increases their situational awareness while decreasing their cognitive load.

In order for systems to be less complicated for the end users, companies need to dedicate time to deal with that complexity through product change and engineering change. Figuring out the complexity must be dealt with by the teams that are working to build the systems. What happens then is that the end user has a much easier, less-costly technology to use that is drastically reduced in complexity.

Andrew Van Fleet, Partner, Visual Logic.

Vander Wiel: Sensors and ongoing diagnostics for technically complex military systems are producing tons of data. In most cases, you see all that data just being dumped onto a screen, and the user ends up having to siphon through all those graphs, charts, and numbers and make sense of it themselves. If more research could be done up front so that we can better understand the user, we should be able to organize and filter that information down to just the things that they actually need. Oftentimes you find that a lot of that information is only necessary one percent of the time, so from the users' perspective it makes sense to remove it from the screen and place it in a more appropriate location.



Kurt Vander Wiel, Partner, Visual Logic.

Breaking Defense: What military systems could benefit the most attention from improved UX?

Van Fleet: The answer is all of them, specifically in the area of system simplification so that training time can be drastically reduced so that users can pick up on a particular system in a very short amount of time and know how it could be used. We don't have time anymore to train people on systems for six to nine months. They need to be able to use systems almost immediately with minimal training, and that is what the military is starting to gravitate toward.

Breaking Defense: How can UX help warfighters make better use of artificial intelligence and machine learning (AI/ML)?

Van Fleet: With those technologies, we're going to start to be able to understand how the user makes decisions and what information they need to make those decisions. Let's take this question up a level. Using missile defense as an example, let's say that there's an incoming missile. Today, the user looks at the data and decides, based on his training, whether that is a missile or not, whether it's hostile or not, and whether it's something we should shoot at or not. In the future, those kinds of decisions are going to be better made by AI/ML. We will be able to bring the user up to one higher level of extraction in order to make decisions on specific actions and in which order they should happen. Instead of having him down in the weeds trying to decide whether this is, in fact, a threat, the user can be making higher-level executive decisions.

Breaking Defense: How will UX help him make those higher-level decisions?

Van Fleet: First of all, it's going to be helping to define those decisions. Right now the military is used to diving down in the weeds but it doesn't need to do that. Give them the numbers, tell them what the numbers mean, and let them make the higher-order decisions. AI/ML will also play an important role in presenting data, especially when things start happening fast, when they're happening in swarms, when things are happening outside of a user's ability to process. User experience is one of the elements we need to help decide how we are even going to deal with that challenge. If there are a thousand incoming drones, how are we going to tell you which ones are the most important ones to think about? We don't have all the answers to that yet. That's exactly the work that needs to be done.

Vander Wiel: You probably heard of the phrase "commander's intent." The human will start to tell the device a commander's intent, as opposed to telling the device "do this exact thing." Picture an autonomous vehicle trying to keep itself inside the lane. What's the human's job there? It's to tell the car, "I want to go here or go there. I want to be in this lane, now I want to switch to that lane," and the car is doing all the small things of keeping you within the lane. So the higher level thought process possible with UX will make it possible for the system to deal with questions like "What's my intent?" "What am I trying to accomplish?" What am I trying to defend against?" That's where the human is more valuable and you let the AI/ML do its job.

Conclusion

Reducing system complexity through User Experience design allows for increased situational awareness and trust in system while decreasing cognitive load and training times.

'This capability didn't exist 30 days ago': How military exercises can drive software development

A recent CENTCOM exercise featured real-time software development, rolling out updates in hours or days, writes CENTCOM Chief Technology Officer Schuyler Moore.

A U.S. Air Force B-1 Lancer conducted a mission flying from the UK to the #middleeast to build agility and interoperability between coalition partners and the U.S. (US Central Command)

By SCHUYLER MOORE - June 29, 2023

Officials have long said that in ever-more interconnected military operations, the software that connects people and platforms is quickly becoming as critical as the platforms themselves. In the following op-ed, Schuyler Moore, chief technology officer for US Central Command, revealed details of a June military exercise CENTCOM held in the Middle East and what it could mean for the future of on-the-fly software development.

This month, U.S. Central Command (CENTCOM) conducted an unusual exercise.

The exercise, Digital Falcon Oasis, brought together a set of capabilities, participants, and processes that foreshadowed the future of digital warfare, and how we might train for that future. The exercise scenario sought to answer a simple, but challenging question: whether the Command could find, prioritize, approve, and neutralize 1,000+ targets that presented a threat to U.S. interests over a 24-hour period.

But alongside the traditional trappings of complex exercises, what really took center stage was the software and, critically, the ability to adapt it on the fly, whether it was supporting civilian intelligence analysts, airmen in the air operations center, or sailors on the maritime watch floor. The mid-exercise software adjustments reflected real-time feedback from participants and capability upgrades in the span of days, or even hours.

The exercise was just the latest evidence for what's become abundantly clear about modern military operations: Software capabilities alone are necessary, but not sufficient. To make an impact, they must be integrated into exercises and operations, where they can be pressure-tested in realistic scenarios. They must also come with mechanisms to rapidly update based on user feedback. We must learn to adapt and update our tools while we fight, and exercises like Digital Falcon Oasis can provide the proving ground to build that capability and capacity.

Breaking The Fourth Wall

The daily morning briefs provided the first clue that the exercise was unusual.

In addition to traditional updates about operations for the day, the briefings included an "engineering update," where software developers, service members, and civilian staff reviewed digital tools that would be integrated into operations for the day and highlighted priorities for the software development team to tackle in the coming week.

As the day progressed, team members would continue with their traditional exercise activities, providing briefings to senior stakeholders and executing a series of live-fire events that included a Bomber Task Force dropping live munitions in theater. But after each briefing, the Director of Operations would pause the team: "Time to break the fourth wall," he'd prompt.

Service members and civilian counterparts would then discuss the digital tools they had just used, where they had met the mark, and where they'd fallen short. Software developers would frantically take notes, injecting themselves on occasion to ask a clarifying question, then retreat to their stations to work on updates that would often be seen within hours.

The exercise often felt like taking part in a multi-course dinner where, after each dish was served, the diners and kitchen staff would get together to discuss how the dish had been made, how the diners had like it, and what could be improved for later courses. The process could feel messy at times, but it was clear at the end that CENTCOM had taken part in a much higher quality dining experience than if participants had stuck with a static menu and dinner service.

"This capability didn't exist 30 days ago." Briefing after briefing, team members began with that preface. Team members watched their conceptual conversations with software developers rapidly transform into real software tools that they could use directly in the exercise, then watched those tools improve over the course of days or even hours as they provided feedback to the development team.

Team members learned how to provide critical feedback in terms that software developers understood and could act upon, and sometimes discovered that the problems required policy or process fixes, not technical ones. In turn, software developers became more educated about operator problem sets, discovered where software tools were or were not intuitive for the users, and learned how to integrate into the battle rhythm of an exercise.

This type of event combines software development best practices with the rigor and reality of military exercises. For digital tools that facilitate warfighting capability (such as targeting, air tasking, and operational planning), their development cycles must be anchored to realistic scenarios and testing – without it, developers risk building tools that don't meet the practical requirements of the warfighter.

Software should not be treated as a static capability, where updates are expected to occur every few years at best. Military exercises provide the proving ground to test, iterate, and update software in the hands of real-world users and scenarios on the order of days or hours.

Digital capability development at CENTCOM will not end with Digital Falcon Oasis. The exercise is part of a quarterly series, and CENTCOM will execute two more Digital Falcon Oasis exercises before the end of 2023 – each building on the software evolutions that came before, and each pushing further toward a truly digital warfighting capability.

Schuyler Moore is the Chief Technology Officer of US Central Command (CENTCOM). She previously served as the Chief Strategy Officer of Task Force 59, US Naval Forces Central Command's (NAVCENT) unmanned and AI integration organization. Schuyler also has previous experience in Congress, the Office of Under Secretary of Defense for Research & Engineering, and the private sector.

Celebrating 30 years of the National Guard's international impact

In this exclusive op-ed, Gen. Daniel Hokanson, 29th chief of the National Guard Bureau, discusses the global impact of the Guard and its State Partnership Program.

Army Gen. Daniel Hokanson, chief of the National Guard Bureau, meets with Brigadier General Arben Kingji, Albania's chief of defense, at the Ministry of Defense in Tirana, Albania, June 9, 2023. Hokanson visited the Balkan nation to reaffirm the New Jersey National Guard's partnership with Albania through the Department of Defense National Guard State Partnership Program. (U.S. Army National Guard photo by Sgt. 1st Class Zach Sheely)

By GEN. DANIEL R. HOKANSON - July 13, 2023

In July, the US National Guard Bureau held an event in DC celebrating the 30th anniversary of the State Partnership Program, which pairs US state guard units with national forces abroad. Gen. Daniel R. Hokanson, the 29th chief of the National Guard Bureau and member of the Joint Chiefs of Staff, used the following piece to celebrate the SPP's accomplishments.

Not long ago, I stood at a military training camp in the German countryside shaking hands with Ukrainian Soldiers preparing to go home and fight Russia's illegal and unprovoked invasion. Their courage profoundly inspired and moved me.

As chief of the National Guard Bureau and a member of the Joint Chiefs of Staff, I traveled to Germany to meet those Ukrainian patriots, and just as importantly, to meet with their trainers — members of the US National Guard. For more than a year, National Guard members from Florida, New York and Arkansas have leveraged the Guard's State Partnership Program to support the administration's policy of providing Ukraine with key skills and resources needed to defend against Russian aggression.

The nexus of the National Guard's international impact is the State Partnership Program. which celebrates its 30th anniversary this month. The program began in 1993 when the former Soviet republics of Latvia, Estonia and Lithuania partnered with the National Guards of Michigan, Maryland, and Pennsylvania, respectively. Today, the program boasts 88 partnerships with 100 nations and extends beyond military professionalism and interoperability to things like disaster response, higher education, healthcare and good governance.

Next week, leaders from around the globe, members of Congress, ambassadors, defense ministers and chiefs of defense from all our partner nations, along with US military leaders, will gather in Washington, DC to celebrate the continued impact and vitality of the State Partnership Program at its 30th anniversary commemoration.

Many Americans may be surprised the National Guard is involved in international partnerships. Best known for domestic missions like helping communities through wildfires and storms, Guardsmen have for decades strengthened national security through these long-term trust relationships that have proven key to enabling the National Defense Strategy. Arguably, Ukraine's ability to limit Russia's February 2022 invasion came due in part to the training and assistance they received from their 30-year partnership with the California National Guard.

The power of state partnerships lies with the National Guard's unique ability to build sustained and enduring human relationships. Guardsmen and members of partner militaries often become as close as family. Many of the once-junior military members have, over the years, risen to lead their military and civilian governments, all with a predisposition toward mutual understanding and respect with the United States.

The Guard's global impact is more dynamic than ever. This Spring alone, I represented the National Guard in Europe at the Munich Security Conference and at the African Chiefs of Defense Conference. I also met with leaders in Finland and Norway as part of more than a dozen face-to-face meetings with key allies and partners. In mid-March, I traveled to the Middle East to solidify a State Partnership agreement between Oman and the state of Arizona. In May, I flew to the Pacific to consult with partners and fine-tune the National Guard's growing mission there, and just last month, I met with leaders in Serbia and Albania.

In our own hemisphere, we have active partnerships with nations like Colombia. In many African nations, state partnerships are building security capacity and countering the negative influence of international bad actors. In 2022, Guardsmen participated in more than 160 events with partner nations on the continent. In the Indo-Pacific, 13 State Partnership Program events include the Washington National Guard recently hosting a cybersecurity conference with Thailand.

The US National Defense Strategy calls alliances and partnerships our "greatest global strategic advantage." The National Guard is uniquely suited to build lasting international bonds that contribute immeasurably to international safety and security. With 1% of the US security cooperation budget, the State Partnership Program is responsible for 20% to 30% of international engagements.

Building effective decades-long and meaningful international relationships for a tiny fraction of U.S. expenditures, the National Guard's global impact continues to deliver impressive results for our national security.

Gen. Daniel R. Hokanson serves as the 29th chief of the National Guard Bureau and is a member of the Joint Chiefs of Staff. As the most senior officer in the National Guard, the nation's second largest military component, he ensures the readiness of the more than 430,000 Soldiers and Airmen who make up the combat reserve of the Army and the Air Force. Hokanson advises the President, Secretary of Defense, and the National Security Council on issues involving the non-federalized National Guard and serves as the statutory channel of communications between the Department of Defense and the 54 states, territories, and the District of Columbia on all matters pertaining to the National Guard.

(Re)assessing the near-term Chinese carrier threat in a Taiwan scenario

In this new op-ed, Ben Ho of IISS looks deeply at the question of how China may use its aircraft carriers in a Taiwan invasion.

Chinese aircraft carrier Liaoning arrives in Hong Kong waters on July 7, 2017, less than a week after a high-profile visit by President Xi Jinping. (Photo credit should read ANTHONY WALLACE/AFP via Getty Images)

By BEN HO WAN BENG - July 21, 2023

Much of the talk around China and Taiwan centers on the so-called "Davidson Window," which sets the date for a potential Chinese invasion of Taiwan as soon as 2027. Part of that concern is China's advancements in aircraft carriers and how they could create strategic headaches for any defense of the much smaller island nation. But in the following analysis, Ben Ho of IISS looked at two prevailing theories about how effective the carriers may be in an invasion, before raising a new way of looking at the issue.

In the past decade, there has been much talk over China's staggering pace of defense modernization. Of note would be Beijing's aircraft-carrier program, and this aspect of the People's Liberation Army Navy (PLAN) has spawned a bustling cottage industry. There have been additions to this conversation in recent months. For instance, in a May Reuters article, various experts maintained that the Chinese carrier force is still embryonic and poses "little threat yet" despite 10 years of development and counting. The story came on the back of the early-spring deployment of the PLAN's second flattop, the Shandong, into the western Pacific and approaching Guam.

The Reuters piece added that there are questions over the value of Chinese carriers during a Taiwan contingency, at least in the short term (read within the next few years or within the timeframe of the "Davidson window."), and such doubts are largely due to the limited capabilities of the Liaoning (China's first flattop) and Shandong. (While China's third carrier, the Fujian, is much more capable owing to its catapult-assisted takeoff and barrier-arrested recovery, or CATOBAR, flight-deck configuration, the ship will probably be operational only in the late 2020s given the "first-in-class" issues that will invariably surface). In response to the Reuters article, military analyst Rick Fisher warned of underestimating the Chinese carrier threat because of the protective cover of Beijing's shore-based anti-access/area-denial (A2/AD) edifice. The arguments both sides put forth have merit, but need more nuance. What is more, that PLAN carrier airpower could adequately menace Taiwan's east coast — an argument which seems to be gaining traction — needs to be addressed.

One issue with the Reuters story is that it seems to compare Chinese flattops with American ones on an individual basis, as Fisher rightly noted. In such a setting, the United States CATOBAR supercarrier, with some 70 aircraft onboard, simply outmatches its Chinese counterpart. On paper, the Liaoning and Shandong have relatively meager air wings (about 20-30 strong). In addition, the PLAN's mainstay carrier-borne fighter, the J-15, has relatively inferior capabilities as it can only operate in the short takeoff and barrier-assisted recovery flight-deck configuration from the Liaoning/Shandong, thereby limiting the aircraft's performance in areas such as range and payload.

In the real world, however, weapon platforms do not operate in isolation, and this is another area where Fisher was on point. Ditto the analyst quoted in a Global Times (interestingly, as it is seen as an unofficial Chinese mouthpiece) response to the Reuters article, who argued that "the Shandong does not fight alone, but in a comprehensive combat system." Indeed, during a Taiwan war, Chinese carriers will arguably operate under the protective umbrella of the PLA's much vaulted "fortress fleet."

Simply put, this concept would see Beijing employing land-based weaponry, especially long-range missiles, to hold enemy navies at risk, concomitantly protecting PLAN forces. The Reuters piece gave short shrift to this aspect of Chinese strategy, with just a brief mention of Beijing's flattops "working in tandem with submarines and anti-ship missiles to attempt to control… (the) near seas." Observers cited in the Reuters story also mentioned that the Chinese carrier fleet has "relied on land-based airfields… for extra air cover and surveillance," but this is to be expected in a fortress-fleet concept of operations.

On the other hand, Fisher goes too far when arguing that Chinese carriers "will operate within a dome of PLA anti-ship missile superiority" and that they "will be hiding behind a literal phalanx of missiles." To speak in such absolute terms is probably overstating the case. To be sure, in principle, the fortress fleet should give the PLAN carrier strike group (CSG) a meaningful degree of cover during a Taiwan contingency. In reality, however, Beijing's idea of "using the land to control the sea" has never been tested in the crucible of war.

Ultimately, the confidence of Chinese planners in the deterrent value and combat viability of their fortress fleet will ultimately influence what mission, if any, PLAN carriers will have against Taiwan.

Chinese Carrier Deployment East of Taiwan?

This brings us to the assumption that these vessels have a role to play, especially in an "eastern front," should cross-Strait hostilities break out within the next few years. Any such role is likely to be secondary given that the island is within range of even short-ranged aviation from the mainland, and the latter could generate more sorties than one or two small-deck carriers, as the Liaoning and Shandong really are. Afforded cover by the fortress fleet, in theory the Chinese CSG could threaten Taiwan from the Philippine Sea and use its mobility to exert a strategic effect ashore by making Taipei divert forces to protect the east coast. (Operationally, the amount of power the two Chinese flattops could project is rather limited, but strategically, even a feint could tie up substantial enemy forces and complicate Taipei's defense planning.)

Recent contributions to the Chinese carrier discourse show that there are members in this "Beijing's flattops are useful against eastern Taiwan" camp. In an April Focus Taiwan report, local experts cited warned of the "serious threat" the Chinese carrier airpower would pose to the island's east side. A day later, Reuters ran a story on the same issue where it noted that the situation could be perilous should there be an "unfettered, more coordinated attack from the east." Tellingly (and rightly so), the Reuters story added a caveat: "Beijing could not operate carriers with impunity in that area during a conflict, analysts said, especially if nations friendly to Taiwan were involved, but added that Taiwan would struggle to deal with such a threat on its own."

Looking at the map, Beijing would probably think twice of using its crown jewels as the centerpiece of any naval operation against eastern Taiwan, should there be external intervention. After all, any Chinese carrier fleet sailing relatively close to that part of the island could find itself boxed in from four directions between unfriendly forces, notwithstanding any cover provided by Beijing's fortress fleet. Besides dealing with any forces Taiwan sends to reinforce its east coast, to the north and northeast, Japan's Ryukyus have substantial military assets operating from them and these islands are being fortified apace. To the south, the Bashi Channel chokepoint and the northern Philippines loom with Manila leaning towards the Americans. There is of course the possibility of the US Seventh Fleet steaming in from the eastern Pacific.

Large warships in general, not just aircraft carriers, enjoy greater freedom of maneuver in the open sea to reduce their vulnerability, and this means any Chinese carrier sent to threaten eastern Taiwan would do well to stay further away from the coast. A Catch-22 situation then arises. Deploy nearer Taiwan and the PLAN CSG finds itself more vulnerable to detection and attack. On the other hand, deploy further east into the Philippine Sea to reduce the chances of being boxed in, and Chinese carrier jets could find themselves near or at their operational limits.

It would not be surprising if the concerns outlined above were probably also in Lee Hsi-ming's mind when the retired Taiwanese admiral and former vice defense minister spoke last month of PLAN flattops not being useful in a cross-Strait war as they "would not be able to withstand attacks by the US military."

Role Reversal for the Carrier?

The dilemma for the Chinese carrier discussed above could, however, be alleviated should the notional PLAN CSG center its operations around its surface combatants rather than the carrier. In other words, the task force's cruiser and destroyer force should paradoxically dish out the "Sunday Punch" rather than the flattop they are screening. In a reversal of roles, the carrier will protect its supposed consorts.

Earlier this year, retired US Navy commander Michael Dahm contended —and rightly so given the relative infancy of Chinese carrier aviation— that "the centerpiece of PLAN strategy, especially over the next decade, will likely continue to be the strike capabilities of its surface combatants and submarines." He added that the carrier's "fighters provide an air-defense umbrella, leaving power projection and striking capabilities —at least for the near term— to Chinese ships and missile-capable submarines." The PLAN's greyhounds for its carrier fleet, the Type 55 cruiser and Type 52D destroyer, are compatible with the CJ-10 land-attack cruise missile. This weapon's thousand-mile range far exceeds the several hundred miles striking reach of carrier-borne aircraft, providing the Chinese force with more operational vistas should the missile be deployed.

Various observers, including this author, have suggested this heterodox concept of operations for carrier forces in general as the operating environment becomes increasingly non-permissive with the maturation of the reconnaissance-strike complex. And while takeaways from the ongoing Russo-Ukraine war are not totally applicable to a Taiwan scenario, they nevertheless offer glimpses of how a high-intensity contest over the island might pan out. One of the key lessons from the Ukraine war is that even limited (not to mention robust ones) enemy air defenses may reduce the role manned aviation plays and increase the accent on standoff weapons, at least during the opening stages of a conflict.

This is likely to happen too during a Taiwan scenario. In such circumstances, a PLAN "missile strike group," rather than the traditional CSG, poses a greater threat to the island. With the relevance of even the American supercarrier being questioned in the face of A2/AD challenge, when it fully comes onboard, the more capable Fujian will face similar problems, albeit to a lesser degree, compared to its small-deck predecessors should it operate on the eastern front of a cross-Strait war.

The answers to these issues will involve substantial blood and treasure, so hopefully we will never get to find out.

Ben Ho is an associate editor at the International Institute of Strategic Studies, where he heads editorial projects of the Cyber Power and Future Conflict Programme. He also has research interests in airpower and seapower issues, especially of the Indo-Pacific.

These technologies could defeat China's missile barrage and defend Taiwan: Analysis

RAND and the Special Competitive Studies Project brought together technology experts from outside the Pentagon to help run a wargame around China and Taiwan. These are the findings.

China and Taiwan relationship illustration. Shadow of China's ambitions for Taiwan. (Getty images)

By JIM MITRE and YLBER BAJRAKTARI - August 22, 2023

Earlier in 2023, a group of experts from RAND and the Special Competitive Studies Project launched a new wargame effort around China's invasion of Taiwan — but unlike most DC-based wargames, this effort heavily involved members of the commercial technology sector in order to understand what near-term capabilities might be brought to bear on a Taiwan scenario. In an exclusive analysis for Breaking Defense, Jim Mitre of RAND and Ylber Bajraktari of SCSP laid out their key findings and gave a pathway forward for how DoD may want to invest its commercial sector funding.

On July 6, as Treasury Secretary Janet Yellen visited China to build a "floor" under US-China relations, 600 miles to the south Chinese leader Xi Jinping was focused on another pressing matter. Visiting the People's Liberation Army Eastern Theater Command, the unit responsible for the Taiwan Strait, Xi called on China's military to enhance war planning, and to raise the forces' capabilities to fight and win. The world, according to Xi, has entered a new period of turbulence, and China's security situation is facing rising uncertainty.

The US intelligence community and a number of senior US military leaders have warned publicly that Xi has directed his commanders to be ready by 2027 to conduct a successful invasion of Taiwan. This is not to suggest that Xi has made a decision to invade by 2027. But — at a minimum — he appears intent on having an option to invade by then.

However, the Defense Department has yet to demonstrate that it can assuredly deny a concerted Chinese military effort to suborn Taiwan in 2027 or beyond. Moreover, the Department is quickly running out of time on this task. 2027 is just barely on the edge of its three-year timeline to start spending funds on a new initiative. And war game after war game indicates that the United States would struggle to win, or — if it did — it would be at high costs.

As time grows short, and with the stability of the Indo-Pacific hanging in the balance, we at the Special Competitive Studies Project and the RAND Corporation sought to stretch the Defense Department's imagination on what solutions may be feasible to adopt within the next few years. In an attempt to try something different, we embarked on a series of wargames that featured not the usual cadre of DC-based strategists and operators, but technologists from some of the most successful companies in Silicon Valley, early-stage tech companies focused on defense, and traditional defense contractors.

To be sure, strategists, operators, and analysts from the Defense Department and RAND — along with political and military representatives from Taiwan — informed and grounded the deliberations. But the technologists were the core participants. A panel of senior civilian and military officials, both active and retired, from the United States, Taiwan, and Australia reviewed the results and assessed which solutions held the most promise for a potential Taiwan contingency.

After identifying hard-to-solve operational problems in the first wargame, the technologists came back to the second wargame and went through a structured brainstorm to generate some 82 different solutions. Taking into consideration each solutions' functionality and feasibility, they then down-selected them to the 17 most promising ones. The third and final wargame explored how these technological solutions could impact US military operations.

The results were as surprising as they were promising. Three encouraging broad themes emerged.

First, there is significant potential for enhancements to US and allied military capabilities from existing technologies. There was not a large call for moonshot projects or technological breakthroughs; instead, the technologists looked to existing capabilities, used in new and innovative ways. To be sure, scaling solutions remains a challenge for the Defense Department— it has an "innovation adoption problem" not an "innovation problem." But the path to adoption is easier when working from established technologies rather than those that are in a nascent stage of development.

Second, proposals with the most promise to have a quick impact are those that focus on providing Defense Department and allied forces with an information advantage over China. They are less dependent on military service-specific investments, and more reliant on initiatives that stitch the services together into a joint force that is interoperable with Taiwan and key allies. This is partly due to the fact that software-centric solutions are more feasible than hardware-centric solutions over the next four years. But it's also driven by a larger trend of the increasing importance of information advantage to the future character of warfare.

Third, there was a sense among participants that in the event of a contingency, US tech companies would step up and support the US government, similar to what has transpired in Ukraine, where technologists are actively — and rather decisively — assisting military operations. To be sure, the number of participating technologists was a limited sample that may not necessarily be representative of the broader innovation ecosystem. But the sentiment among them seemed to suggest that the opposition to collaborating that the Defense Department had encountered five years ago from select Silicon Valley technologists may not manifest itself in a crisis.

Here are some of the 17 total operational problems and solutions that the gaming series surfaced and that we believe could help close potential deterrence gaps in the near-term, enabling America's positional advantage over the next decade.

Disrupting The Adversary's Kill Chain

China's wide array of sensors and weapon systems able to strike assets in the theater of operations during a China-Taiwan invasion scenario threatens the survivability and resilience of US and allied forces. A key operational problem confronting the Defense Department therefore is the ability to disrupt China's targeting of US and allied forces.

Multi-Domain Drone Mimics. Large numbers of low-cost, uncrewed air and maritime vehicles would confuse China's battlespace awareness and complicate its ability to identify high-value targets. These drone mimics could also have the benefit of creating the perception of a larger coalition force, drawing Chinese forces to incorrect locations, or causing it to expend advanced munitions on false targets. The Defense Department has fielded unmanned systems with payloads useful for deception but it is unclear that they have been tailored for this purpose.

Algorithmic Optimization of Decoys. An application that leverages information on China's collection platforms could alert friendly units when they were likely under surveillance, and inform their use of physical, electronic, and cyber decoys, as well as cover, camouflage, and other force maneuvers. As the war in Ukraine underscores, decoys and deception are key to improving the odds of surviving on a transparent battlefield.

"Smart" Sea Mines. The orchestrated employment of "smart" sea mines showed promise as a formidable defensive obstacle. Smart mines could be repositioned – autonomously or remotely – to swarm and destroy high-value targets, or channel Chinese military ships toward areas where they are more easily targeted. The mines could be deployed – and reseeded – from unmanned surface or underwater assets or launched from coastal areas. While smart mines exist, collaborative and swarming behaviors have not yet been developed to enable this capability.

"YESFORN" Situational Awareness

US and Taiwanese forces must be able to share information in real-time once the conflict begins for a host of reasons, such as coordinating operations and leveraging each other's sensor networks and target quality data.

Real-Time Translation. Most China-Taiwan conflict analyses assume the US and Taiwanese militaries can speak with each other. Yet Taiwan has a low English proficiency, with estimates that less than a third of Taiwanese speak English. The Defense Department is training more Mandarin linguists, but from an even lower base. Only 1.1% of Americans speak Mandarin or Cantonese at home. Technologists, therefore, proposed a solution that enables real-time translations. The application would run on equipment carried by deployed personnel and work regardless of connectivity. It would handle various dialects and accurately translate military jargon.

"Uncommon Operating Picture." While better communication between US and Taiwanese forces is critical, the Defense Department must avoid having that information fall into the wrong hands. One solution is to enable the sharing and aggregating of information between allies and partners that facilitates the coalition to execute a common plan while concealing its precise order of battle. This "uncommon operating picture" with partners would obfuscate the exact location of US and coalition forces, deliver spatially-aggregated information, tailor information to certain geographic areas, and reduce the risk to America and allies if the Chinese successfully accesses the system.

Shared Cloud Infrastructure. Establishing a cloud computing infrastructure would enable data and compute collaboration first between US forces, and then with Taiwanese forces. Such "blue-blue" and "blue-green" data infrastructure integration would help preserve records, enable communication and collaboration across all, and be less reliant on connectivity. An architecture like this would considerably simplify data sharing between the United States and Taiwan by providing standardized methods of exchange and a single aggregated system with which to interact.

Military vehicles carrying DF-17 missiles participate in a military parade at Tiananmen Square in Beijing on October 1, 2019, to mark the 70th anniversary of the founding of the Peoples Republic of China. (Photo by GREG BAKER / AFP) (Photo credit should read GREG BAKER/AFP via Getty Images)

Empowering At The Tactical Edge

In modern warfare, static positions or assets with a highly visible signature have an extremely low life expectancy. Individuals and tactical commanders must become highly mobile to improve their odds of protection from detection and destruction. This is true not just for front-line forces and logistics, but for command centers because of their constant electronic emissions.

Fitting Multiple Networks Into a Single Device. The United States and Taiwan must retain the ability to conduct robust command and control while dispersed and moving. They need data feeds, computing power, and multiple displays on their handheld devices with the ability to securely connect to secret and top-secret data. Today, this requires lugging around multiple computers certified to operate on individual networks. To be mobile, technologists suggested solutions to fit multiple networks onto a single device with cybersecurity safeguards to protect each network but with the ability to toggle between networks.

Integrated Warfighter Network. Chinese electronic warfare capabilities have grown significantly in recent years and could disrupt US communication networks and impair joint maneuvers. Current communications are typically designed to support a specific source/destination and a specific data type. The Integrated Warfighter Network breaks down these barriers to create a fully interoperable network that maximizes the use of any available link. It would ensure that individual pieces of military equipment or communications gear are able to use any available network path, hence creating robust and secure channels for data and communications that can survive Chinese attacks. The Integrated Warfare Network is an existing Defense Department capability that does not require tech maturation, only widespread adoption.

Combat Suite of Apps. In the heavily urbanized island, the tactical edge also includes Taiwanese civilians who serve as extra "eyes and ears" for the Taiwanese military, as well as provide additional manpower, and specialist capabilities — a digital form of levée en masse. In Ukraine, civilians used existing communications apps, such as Signal and WhatsApp, and have developed new ones for a range of uses, including tracking Russian troop movements, coordinating supplies, and finding evacuation routes. A "Commercial Combat Suite" would provide an analogous capability for Taiwan. It would use commercial software with an established market share in Taiwan or develop purpose-built applications for unique use cases.

Enhanced Lethality

After the wargame series concluded, the most promising solutions were tested by RAND in a campaign analysis to assess whether they had a positive impact on the performance of US and Taiwanese forces relative to the first wargame when these capabilities were not available. They do.

In the initial game without the above solutions, the United States lost over one hundred 5th generation fighter aircraft, mostly on the ground, due to missile strikes. But when implementing the 17 solutions, an estimated 50% fewer losses of US 5th generation fighters occurred in the first five days of hostilities. Synergistic effects of multiple solutions led to an increase in Chinese fighter losses by an estimated 70% in the same time period. Furthermore, Chinese amphibious force losses increased from about half to at least two-thirds of their force. The Chinese air assault force also lost significant percentages of its total strength.

There is no certainty how these tech solutions would perform in the real world as reflected in this model. The results are exemplary and could have a wide variation; they are based on a host of assumptions about how the solutions would be implemented, integrated, and employed. Nevertheless, they show great promise and are worthy of serious consideration for further investment.

Given that many of these technologies are out in the marketplace, they are also available to China in some form or other. Lack of pursuit risks America falling behind. Sensible application today of technological solutions like these would do much to close potential deterrence gaps and enable a favorable regional balance of power in the Indo-Pacific over the next decade.

Jim Mitre is a senior international/defense researcher and director of the International Security and Defense Policy Program at the RAND Corporation. Ylber Bajraktari is a Senior Advisor for Defense and Intelligence at the Special Competitive Studies Project.

Rep. Ken Calvert: A hedge strategy for US military superiority

In an exclusive op-ed, Rep. Ken Calvert, the Chairman of the House Defense Appropriations Subcommittee, lays out how he hopes to improve the military's technological capabilities.

Capt. Mike Aiena, left, commanding officer of Naval Surface Warfare Center, Corona Division, and U.S. Rep. Ken Calvert, 42nd District of California and chairman of the Defense Subcommittee in the House Appropriations Committee, engage in a tour of the warfare center in Norco, California, Nov. 2, 2022. (U.S. Navy photo by Neil Mabini)

By REP. KEN CALVERT - September 27, 2023

Few members of Congress are as important to the defense sector as California Republican Rep. Ken Calvert, the Chairman of the House Defense Appropriations Subcommittee. In September, Calvert came to Breaking Defense to make the case for language he had authored that, he said, could help drive military technological innovation.

Maintaining the status quo in our defense posture will ensure that the Chinese Communist Party's whole-of-government effort to erode American influence and power will become a reality. It is no coincidence that the first congressional delegation I led as Chairman of the House Defense Appropriations Subcommittee was to the Indo-Pacific, and that the first defense funding bill I am advancing to the House floor this week prioritizes our military superiority through technological innovation. Heightened tensions around the globe, along with the need for greater fiscal responsibility, require meaningful change to our national security enterprise.

Decades ago, US government spending was the leading driver for new technological advancement, but today, private capital for commercial technology eclipses government funding to technology development. Unfortunately, a multi-decade persistence of a culture at the Department of Defense that incentivizes near-term risk avoidance through slow bureaucratic processes has accrued long-term strategic risk to American world leadership.

Military history has taught us that it is the nation which encourages and leverages disruptive innovations first that has the upper hand. We no longer have an inherent advantage and must work twice as hard to re-establish it.

Fortunately, several years ago the DoD began to realize this risk and opportunity and started creating innovation organizations like the Defense Innovation Unit (DIU), SOFWERX, AFWERX, Task Force 59, and others. These organizations have made significant progress in accelerating and reshaping contracting and other acquisition functions with limited resources. The work of these organizations has been bolstered by initiatives such as the Accelerate the Procurement and Fielding of Innovative Technologies or APFIT program, which I fought for the creation of two years ago to bridge the gap between technically mature prototypes and the DoD's slow budgeting process.

That said, change is hard, and these non-traditional innovation fielding enterprises have not yet achieved their full potential. The Fiscal Year 2024 Defense Appropriations Bill changes that, thanks to a proactive approach by creating a $1 billion hedge portfolio of capabilities, intentionally taking calculated risks to incentivize positive, deliberate and accelerated change.

This portfolio is a hedge against growing and innate tactical and logistical risks to current weapon systems, as well as a hedge against industrial base capacity and diversity risks. As outlined in my bill, this hedge portfolio will focus on smart, affordable, modular and sustainable systems to include low-cost, light-logistics, multi-domain drones, satellites and munitions; agile communications, computers and sensor nodes; and artificial intelligence agents and users. Networked together, these systems will create an asymmetric advantage to support combatant command operational challenges like contested logistics, electronic warfare, resilient communications and weapon and platform capacity.

The hedge portfolio funding will be managed under DIU and dispersed to Service-level Non-Traditional Innovation Fielding Enterprise (NIFE) units, to rapidly field relevant capability to the warfighter by using a new requirements development paradigm. It will drive a series of projects that begin with a clear warfighting problem and iterate to mature requirements while developing software and hardware for fielding at scale within three years by using small teams of warfighters, acquirers and technologists. This agile approach — experiment, exercise and deploy in low-rate production, potentially as a service — allows developers refining the technology to work beside the operators refining the doctrine, organization, training, materiel, leadership, personnel, facilities and policies with an unmatched pace of adoption.

The metric for success is the time it takes to field affordable and operationally relevant capability, which in turn requires letting DoD have more control over its dollars and cents. Increased warfighter flexibility can often cause heartburn on the Hill, as it feels like it often comes with a lack of Congressional oversight. But using modern business practices means the risk for taxpayers should be low, and the rewards are potentially great.

For too long, our country has relied on too few in the defense industrial base to provide for our nation's security. With even more consolidation in the defense industrial base likely, it is essential to build broader partnerships for national security technology, talent, and capital. We must attract non-traditional partners into the defense ecosystem, while working closely with traditional defense contractors to further expand capabilities and integrate non-traditional solutions.

The culture of risk-avoidance must substantively change across all three facets of the current procurement model of requirements, budgeting, and acquisitions. Properly executed, this hedge strategy has the potential to reduce the taxpayer's burden by leveraging private capital, to expand America's economic advantage by accelerating emerging technology and to broaden the pool of talent supporting national defense. If America takes the preferred route and never goes to war, investment in this hedge portfolio will not only preserve peace but will also bolster prosperity by affordably ensuring America's commercial technological advantage.

A disruptive hedge strategy empowers America's talented entrepreneurs to move quickly with newfound flexibility in instrumented processes, enabled by rapid reporting of relevant information. Failure is to be expected when moving at a relevant pace, but with the right culture these lessons learned enable rapid iteration to achieve faster successes. It is time to adopt and rapidly scale a hedge strategy that bets on the American entrepreneurial spirit, informed by the ideals of our American democracy that values liberty, human dignity, and opportunity, to outmaneuver a rising and dangerous Chinese Communist Party.

Rep. Ken Calvert is the Chairman of the Defense Appropriations Subcommittee in the House of Representatives and represents California's 41st District.

Rep. Joe Courtney: US undersea supremacy is only growing stronger

In a new op-ed, Rep. Joe Courtney, D-CT., makes the case for why America's submarine capabilities are still robust.

Rep. Joe Courtney, D-CT., (center) speaks with gold crew Sailors during a familiarization tour aboard USS Kentucky (SSBN 737), Feb. 19. 2020. (U.S. Navy photo by Mass Communication Specialist 1st Class Andrea Perez/Released)

By REP. JOE COURTNEY - October 12, 2023

In October, Rep. Joe Courtney returned to the Breaking Defense op-ed section. His goal: to push back at criticisms that had emerged elsewhere about the health of the US submarine force. His conclusion: There is work to be done, but the overall picture is healthier than some critics would like to admit.

Seth Cropsey's recent commentary in the Wall Street Journal on the state of the US submarine force unfortunately omits numerous recent developments that cast a much different light on this critical issue. While his focus on maintaining our advantage in the undersea domain is absolutely on target, the Navy, supported by Congress, is intensely engaged in enhancing that superiority.

His claim that our submarine fleet of 68 nuclear powered vessels is in a "dire state" ignores the fact that submarine production has been steadily increasing since 2011, when Congress doubled Virginia attack submarine production. That only sped up in 2021, when the Columbia ballistic submarine program commenced. It is true that, like manufacturing across the country, COVID slowed shipyard production. However, production tonnage of US submarines is on the rise and unprecedented investments made by Congress and the Biden Administration have positioned our submarine industrial base to grow, not contract, America's unmatched undersea capability.

For example, on October 14th, the Navy will commission the 22nd boat in the Virginia-class submarine program, the USS Hyman G. Rickover, in Connecticut. Shortly thereafter in New Jersey, the Navy will commission the 23rd boat in the program, the USS New Jersey. This comes after the Navy commissioned two Virginia submarines last year – the USS Oregon and USS Montana – demonstrating the two-per-year delivery rate that had slowed in 2020 and 2021 is moving back on schedule. At present, there are 13 additional submarines in the production queue.

That's new production, but it's important to note the number of existing submarines repaired and ready for deployment is not as "dire" as Mr. Cropsey stated. Yes, earthquake repairs to the Navy's drydocks in Puget Sound did delay ship availability. However, since May, the operational availability of attack submarines has increased from 60 to 67 percent – higher than the out-of-date number Cropsey cited. And Adm. William Houston, head of the submarine force, has the Navy on pace to hit 80 percent by 2028.

His new approach to attack submarine maintenance, which couples a 15-year attack submarine maintenance plan and a $1.7 billion investment in maintenance, will enable the Department to better predict maintenance and ensure spare parts are on shelves before repairs are even required— accelerating turnaround time.

Most importantly though, the article omits critical investments to grow the submarine industrial base that will dramatically increase capacity for higher production.

First, in 2022, the Biden Administration embarked on a five-year, $2.4 billion investment in the submarine industrial base to boost hiring and spread the work across the supply chain, in order to take pressure off primary shipyards like Electric Boat in New England and Newport News in Virginia. This has already yielded positive results with contracts awarded to Austal shipyard in Alabama to build modules for Electric Boat and Newport News. Millions of man hours will be added to US submarine construction with this effort.

Second, the Australian government, as part of the AUKUS security agreement, has committed an eye-watering $3 billion investment into our submarine industrial base.

Taken together, these record investments totaling $5.4 billion are sending a clear demand signal to the industrial base that this enterprise is in for the long haul.

This strong demand signal is already bearing fruit. In calendar year 2022, Electric Boat hired a total of 3,800 employees. In the first eight months of this calendar year, the shipyard hired 4,000 new workers and is well on its way to meet and even exceed its hiring goal of 5,750 employees. Between Electric Boat's two facilities in Rhode Island and Connecticut, 21,000 people are now hard at work, over double the number from 10 years ago. This is not a coincidence, but the result of an aggressive campaign to identify new prospective talent pools, train candidates at regional manufacturing pipelines, and get them into the shipyards to begin work.

This boon is not isolated to Electric Boat. The investments funded by Congress are now supporting nearly 200 suppliers in 31 states, with overall capacity increased by 10 percent.

While we still have considerable work to do, Mr. Cropsey's suggestion to purchase foreign-made, non-nuclear diesel submarines from Japan and South Korea is not a logical answer.

Taiwan recently launched its first domestic submarine, while Japan and South Korea operate a combined fleet of over 40 non-nuclear boats, regularly patrolling these waters. These nations, as noted by Mr. Cropsey, are strengthening their ties, with ambassador to Japan Rahm Emanuel's terrific work bearing fruit in trilateral efforts. Trying to pull from their domestic production to fill our needs could throw a wrench into that process.

But even if it made sense to pull in foreign subs, bringing back non-nuclear submarines into the US fleet doesn't make sense at this point.

There is a compelling rationale behind the United States' decision to phase out non-nuclear submarines more than three decades ago. The concluding chapter of this era unfolded in 1990 with the decommissioning of the USS Blueback. Non-nuclear submarines pose unique logistical challenges, particularly during remote or extended deployments. This holds true for foreign government-constructed forward-deployed submarines, without even delving into the lack of established training pipelines required to prepare the new generation of US sailors for this endeavor.

Non-nuclear submarines of course would have a role to play in a conflict — but it's not a role that the US needs to be filling when we have more high-end capabilities to offer. For example, the USS Arizona, a Virginia-class Block V submarine currently under construction, will introduce the Virginia Payload Module, featuring 12 Vertical Launch Cells capable of deploying hypersonic cruise missiles. This reinforces America's foremost advantage, as Mr. Cropsey highlighted: our submarine fleet, the most advanced, extensive, and capable in the world. We are on the path to continue to deliver an unmatched fleet of underwater dominance, getting distracted at this juncture to pursue tactics and strategies that our greatest pacific allies already practice daily would be a mistake.

Yes, our submarine industrial base slowed during the COVID era. Does that mean that it is a static picture that cannot improve? No. The enterprise will improve assuming precious Navy dollars continue to be invested in the industrial base just as they were during the Cold War. We should not go back in time and expend resources on conventionally powered submarines that we know do not have the necessary range or capability required for the pacing threat to our Navy's fleet in the Indo-Pacific.

Rep. Joe Courtney of Connecticut is the Ranking Member of the House Subcommittee on Seapower and Projection Forces.

Why Congress needs to back supplemental funding for the Navy's future fleet

"The president and Congress must go beyond one-off supplemental measures" to support Naval shipbuilding, writes Mackenzie Eaglen of the American Enterprise Institute.

GROTON, Conn. (October 14, 2023) – Sailors assigned to the Virginia-class fast attack submarine USS Hyman G. Rickover (SSN 795) man the ship during a commissioning ceremony at Naval Submarine Base New London in Groton, Connecticut (US Navy photo by John Narewski)

By MACKENZIE EAGLEN - November 03, 2023

On Oct. 20, President Joe Biden requested $105 billion in supplemental funding to back aid for Israel and Ukraine, as well as $3.4 billion specifically to help America's shipbuilding. In this analysis from November, Mackenzie Eaglen of the American Enterprise Institute goes deep on why the Biden administration is worried about the fleet, and why she believes Congress needs to take action.

The White House's $105 billion emergency spending request for ongoing wars in Europe and the Middle East also includes $3.4 billion for America's submarine industrial base. This is on top of the $647 million in the president's budget request for this fiscal year for submarine shipbuilding and workforce development.

The administration is in a hurry to strengthen the workforces and shipyards that build American subs. This is in part because the AUKUS alliance is important to bolstering deterrence in Asia. But some in Congress are concerned about the viability of supplying Australia with US-made attack submarines if our own sub fleet must shrink in the near term as a result.

This $3.4 billion supplemental is the latest in a string of proposed investment efforts to revitalize the ailing submarine industrial base, which includes the Biden administration's previous $2.4 billion five-year investment and a potential $3 billion investment from Australia. While these are much-needed pools of money to reverse the decline of our submarine industrial base, the base needs to improve, not just recover, to build the submarine fleet required by our future navy, meet the commitments set forth in the AUKUS agreement, and continue to deter the aggression of our adversaries.

The president and Congress must go beyond one-off supplemental measures and provide our Navy with robust and stable budgetary investments for the critical years to come.

America's Ailing Submarine Fleet

As initially laid out in the Biden administration's FY22 shipbuilding plan, the Navy has set a requirement of 66 to 72 nuclear-powered attack submarines to adequately carry out the National Defense Strategy and deter and defeat adversaries. However, the US currently has a fleet of just 49 attack submarines currently — and the reality is bleaker when you look at actual operational rates.

In 2013, 12 submarines (23 percent of the total submarine fleet) were in maintenance or awaiting maintenance. A decade later, while the number of boats has gone up, the maintenance situation has actually worsened, and 18 submarines — or 37 percent — are not operational. This maintenance backlog shrinks down our 49-boat fleet to just 31 operational boats at any given time, half of what is requested by combatant commanders.

What's causing maintenance delays? The problems are numerous, ranging from supply chain disruptions to faulty planning assumptions. Shortages of spare parts are forcing crews to cannibalize parts from other depot-laden vessels, exacerbating the logjam. However, the paramount obstacle is that there are only a half dozen shipyards in the entire country that can perform depot-level maintenance on nuclear-powered vessels, which is split between submarines and aircraft carriers.

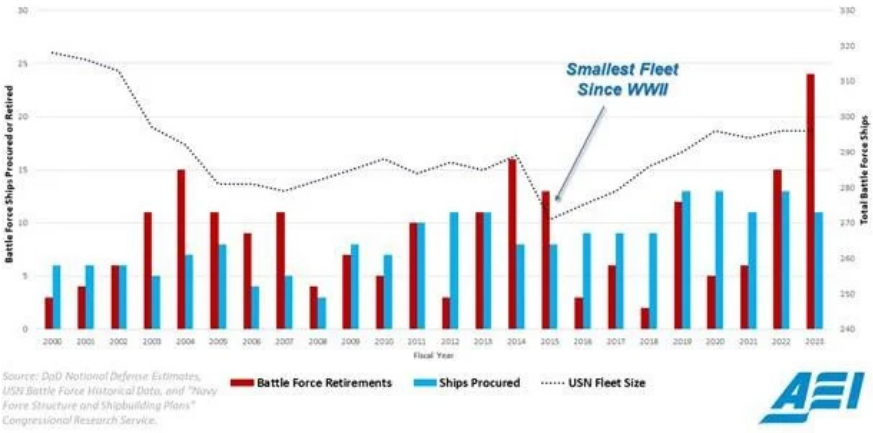
With only so many berths available, there's a long and growing waiting list for repairs. This is leading to a rapid shrinking of our attack submarine fleet. Take for example the USS Connecticut, which was damaged in an accident in 2021 and now isn't expected to be operational again until 2026. The vessel has effectively been knocked out for a half decade.

These issues shouldn't come as a surprise since they are symptoms of deliberate policy choices. Since the end of the Cold War, the US Navy has been consistently downsized. Vast sums of ships were retired, and the total fleet size has been nearly halved from a 526 ship navy in 1991 to a 291 ship navy today.

The decline of our submarine industrial base is a particularly illustrative example. Under the budgets of President Ronald Reagan, the US Navy procured four attack submarines per year, and shipyard output matched demand. Contrast that with the post-Cold War drawdown, when stunningly, only three submarines in total were procured between 1991 and 1998.

Since the Pentagon is the sole buyer of warships, private industry responded accordingly to a plummeting of demand by cutting workforces and closing yards.

Figure 1: US Navy Battle Force Stalls as Retirements Outpace New Construction



As seen in Figure 1, battle force retirements have outpaced new procurement for the past two decades. Unstable funding and changing demands have left industry to err on the side of caution in keeping excess shipbuilding capacity on hand. As former Chief of Naval Operations, Adm. Mike Gilday put it, "The biggest barrier to adding more ships to the Navy is industrial base capacity."

Owing to this shrunken industrial base, production of Virginia-class submarines is far behind schedule. The submarines are being procured at a rate of two per year. But production can't keep pace with procurement, and on average only 1.2 submarines are being constructed annually. As retirements of older attack submarines grow in the coming decade, this bathtub in production not only means the Navy will be nowhere near stated goals, but also means that the US submarine fleet will plunge below necessary levels.

Worse yet, production of Columbia-class submarines has struck similar construction delays, and will likely pull time, space and workers away from Virginia construction.

Current Investment Proposals Are Not Enough to Reverse Decline

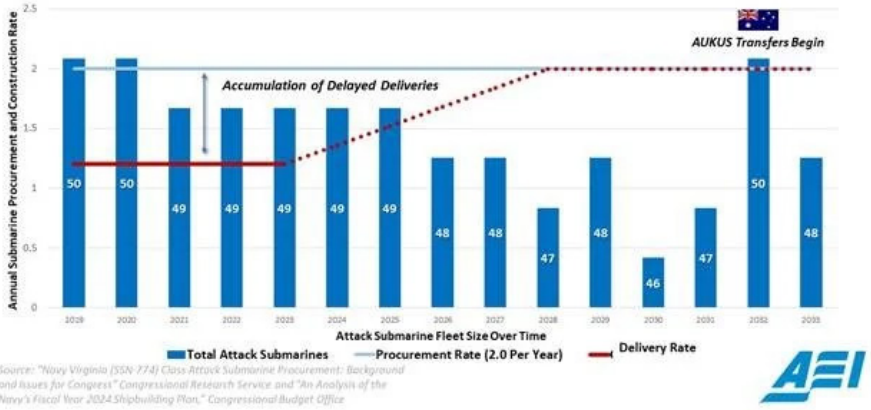
The Biden administration's previously pledged $2.4 billion investment (which includes the previously mentioned $647 million in 2024) is spread over a five-year period. During that same time, the Navy is set to spend $83.7 billion in total submarine construction, including Columbia. Combined with the newly proposed $3.4 billion supplemental to be spent in FY24, the Biden administration's total investment will amount to just a 6.9 percent increase over Navy plans over the next five years — enough to address some issues, but not nearly enough to double production. The extent of Australia's additional AUKUS investment is also currently still being planned, meaning it's far too early to ascertain which areas of the submarine industrial base it will boost.

Even with the prospect of these combined billions in additional investment, the Navy does not project attack submarine construction to rise to 2.0 subs per year until 2028. Navy officials have stated that Virginia class submarines have averaged an annual construction rate of 1.2 over the past five years, despite consistent procurement of two-subs-per-year. These construction delays mean that the Navy is set to endure at least a decade of delayed deliveries of attack submarines.

Considering that attack submarines have an estimated minimum 60-month construction timeline, delays in construction will dampen delivery rate far into the future even though the projected return to a 2.0 delivery rate in 2028 appears to mend the construction-delivery gap.

Years of procurement outpacing actual deliveries has resulted the accumulation of missed subs between 2019 and 2029. Based on the Navy's current and past construction rate of 1.2 submarines per year and a projected linear recovery between 2023 and 2028 in the annual submarine construction rate, the Navy accumulates at least 5.6 submarines worth of "missed" deliveries over the decade, as depicted in Figure 2.

Figure 2: Delayed Submarine Deliveries Will Lower Submarine Inventory in Coming Decade



The consequences from operating well under planned delivery rates will have a delayed effect on the size of America's sub fleet, as planned retirements for the older Los Angeles and Seawolf classes begin to accelerate in the late 2020s and early 2030s. Since these retirements are set to outpace new deliveries of Virginia-class subs, the fleet will shrink before it gets any bigger.

Under these current projections, the Navy will continue fall far short of planned ship levels in the least ambitious shipbuilding plan, which is based off of the President's 2024 budget request and assumes no real growth in shipbuilding funding. Over the next decade, the Navy's submarine inventory will peak at 50 attack submarines, well below the desired goal of 66 to 72 subs. As seen in Figure 2, the attack submarine fleet is set to plunge down to just 46 ships in 2030.

The actual fleet (versus the planned and projected fleet) is at least 20 boats short of the Navy's requirements. This shortfall will undermine the strength of American deterrence. Nuclear-powered attack submarines are a key component in halting aggressive Chinese military action in the Indo-Pacific. A fleet of just 46 ships would mean our attack submarine fleet is set to be the smallest it's been since the end of the Cold War in the late 2020s and early 2030s — precisely the window of maximum danger.

A shrinking submarine fleet could doom AUKUS, as the Navy won't be able to manage the gap in capability due to the transfer of attack submarines to Australia. Research from the Congressional Budget Office indicates that the transfer of three to five Virginia-class submarines to Australia would have a lasting effect on the size of the US fleet. These CBO projections indicate that under current construction rates, the US fleet would not recover for this transfer until 2055 at the earliest.

More Capital for Capital Assets

What can be done? To mitigate this risk and meet both US needs and AUKUS commitments, sub production needs to double to a rate of at least 2.33 Virginias each year. This does not include additional production capacity needed for building Columbia-class submarines either, which is roughly two-and-a-half times the tonnage of a Virginia class.

Sen. Roger Wicker, R-Miss., has been leading an effort in Congress for extra funds and authorities to meet expand sub construction to ensure AUKUS succeeds. The $3.4 billion in the latest supplemental spending request is a good start but there is more work to do.

These issues facing the Navy's future submarine fleet are just the tip of the iceberg, as the surface fleet faces similarly stark and negative trends. Arleigh Burke-class destroyers, which account for 65 percent of the surface fleet, are reaching the end of their 35-year service lives. Already the Navy has begun to issue extensions to arrest the decline. A 2021 report directed by Sen. Tom Cotton, R-Ark., found that there are numerous shortcomings in the surface fleet maintenance program, leading to cancellations, delays and reduced maintenance availability.

To make matters worse, China has surpassed our shipbuilding capacity, with a recent Navy report suggesting that China has over 200 times greater shipbuilding capacity than the United States. The report estimates that China's shipyards have a capacity of 23,250,000 gross tons, while the United States has less than 100,000.

While the US Navy's ship retirements often outpace new construction, China's fleet has grown consistently with dozens of new hulls put in the water year after year. Future projections are bleak, as the US battle force is set to slowly climb to just above 300 ships by 2035, while the Chinese navy will stand at 475 battle force ships.

To adequately deter China and ensure the future strength of our fleet, Congress must provide the Navy's shipbuilding budget with real growth to fully invest in facilities and workers. Defense budgets over the past few years have failed to offset rampant inflation.

The first order of business should be modernizing aging shipyards. Many key facilities were built for WWII and have not been overhauled to support the maintenance of nuclear-powered vessels. This has led to numerous challenges that contribute to thousands of days of maintenance delays.

Improving dry dock availability by building new dry docks and modernizing existing facilities is also urgent. The Navy has recently begun this work at existing yards which will expand topline maintenance capacity. But a portion of dry docks at shipyards are so antiquated that they cannot service modern aircraft carriers and submarines, worsening maintenance bottlenecks. To maximize more efficient repair timelines, these projects need funds now since modernizing dry docks could take 20 years to complete.

New shipyards and facilities should also be investigated. A recent report from the Congressional Commission on the Strategic Posture of the United States proposed the creation of a third shipyard dedicated to the production of nuclear powered vessels — especially submarines. Reopening a previously closed public shipyard, such as at Charleston or Mare Island, and reconstituting maintenance facilities in Guam would be a boon to submarine readiness.

The Congressional Budget Office has reported that shipbuilding budgets cannot afford the fleet of the future, and estimate at least a 23 percent increase to make even the least ambitious shipbuilding plan a reality. Congress has acted to ensure over the past two decades that the Navy's shipbuilding budget has nearly tripled with legislators consistently appropriating more for ships than requested.

Congress must continue to work with the Navy to ensure the effectiveness of targeted investments in shipbuilding capacity. The pending supplemental bill to authorize additional procurement, fund shipyard modernization and train new workers are important to reversing the sub fleet's decline.

Actions like these will equip our shipbuilders with the tools they need to staff up and open the yards, as well as send a strong signal to adversaries that we're serious about size of our future fleet. Also, to ensure AUKUS is a win for all parties, Congress should approve additional funds immediately for the sub industrial base.

Mackenzie Eaglen is a defense expert at the American Enterprise Institute (AEI) and member of the Breaking Defense Board of Contributors.