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INDUSTRY PERSPECTIVES ON DEFENSE INNOVATION AND DETERRENCE

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HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON CYBER, INFORMATION TECHNOLOGIES, AND INNOVATION,
Washington, DC, Wednesday, September 20, 2023.

OPENING STATEMENT OF HON. MIKE GALLAGHER, A REPRESENTATIVE FROM WISCONSIN, CHAIRMAN, SUBCOMMITTEE ON CYBER, INFORMATION TECHNOLOGIES, AND INNOVATION

Mr. GALLAGHER. The subcommittee will come to order.

Last week the Secretary of the Air Force Frank Kendall stated "the intelligence couldn't be clearer . . . China is preparing for a war and specifically for a war with the United States."

So if we took this warning from the Secretary of the Air Force seriously and thereby got serious about preventing a war with China, preventing World War III, a war that has the potential to make previous world wars look restrained in comparison, we would immediately shift the Pentagon away from a posture optimized for peacetime efficiency and onto a war footing.

We would embrace that basic paradox that to avoid a war we have to adopt a war footing. Obviously, this is very hard to do in a free society like that in America. Once we get moving, once the crisis occurs, America has a special talent for mobilizing and beating totalitarian regimes that struggle to deal with friction.

But the abiding weakness of free peoples is that our governments cannot or will not make us prepare or sacrifice before we are aroused, to quote a famous statement from the Korean war. Thus, even as the horrors of war ravage Europe, in my opinion we have not mobilized to prevent a war in the Pacific.

We have not moved to maximum production rates of long-range precision fires and in 1 week $11 billion of previously appropriated defense money from previous years, money we have already given to the Defense Department, is going to evaporate. It will turn into a pumpkin on midnight on September 30th if we do not act.

We have hundreds of Pentagon innovation projects that sound great and are well intentioned but seem for whatever reason not to solve the basic problem. And I know this because every year I attend the Reagan National Defense Forum and I listen to different Secretaries of Defense giving the exact same speech about the valley of death and all the problems with the acquisition bureaucracy and, yet, the problem persists.

And then I attend the exact same innovation dinners with the exact same innovation people and we all sit there inveighing against the primes and the broken acquisition culture.

To quote Bill Murray's character in "Groundhog Day," "I wake up every day right here, right in Punxsutawney, and it's always February 2nd and there's nothing I can do about it."

So today we're lucky to have three defense leaders to help us make sense of this and help us escape "Groundhog Day." They represent three companies at different stages of defense development.

Jim Taiclet is the CEO [chief executive officer] of Lockheed Martin, Brian Schimpf is the CEO of Anduril Industries, and Richard Jenkins is the CEO of Saildrone. I sincerely thank you all for being here. We know how busy you are.

We had originally conceived of this as a hearing where we would have two sort of big defense primes and two nonprime companies. It may shock you to learn this, Mr. Taiclet, that not all of your peers were eager to testify before Congress. Some, in fact, told us that none of the dates we offered could work.

We then asked them to name whatever date worked for them and they said, just kidding—we'll only testify before the full committee but had refused previously to do just that.

I'm not going to name names but you know who you are. And others are just nervous about having a discussion with Congress. So I think it speaks well of all of you and your companies and the culture you've built that you're willing to engage with us in a dialogue today and I promise you we're all very nice on this committee.

All I ask today is for your candor. Tell us in simple and direct language that an ordinary American can understand, meaning no acronyms, what we need to do to fix this problem, what we need to do to turbo charge our innovation enterprise in defense, what we need to do to defibrillate a sclerotic defense industrial base and thereby prevent war, which is the business we are all in. We cannot keep wasting time.

And before I turn it over to the ranking member, I'd like to take this opportunity to invite Deputy Secretary Hicks to headline our next CITI [Subcommittee on Cyber, Information Technologies, and Innovation] hearing on her newly announced Replicator Initiative and how that can turbo charge innovation and enhance deterrence.

I want Replicator to work. I want to understand it better. And though we are just a humble subcommittee I would submit that this is the best forum to have a serious, sober conversation about how to make it work.

This is when I would turn it over to the ranking member. He's not here. Okay. I guess Mr. Ryan could just extemporize for—if he wants to. I yield to—okay, good. All right.

We will go right to testimony and then we will allow Mr. Khanna to say what he wants to say when he gets back.

We will start with you, Mr. Taiclet.

STATEMENT OF JAMES D. TAICLET, CHAIRMAN, PRESIDENT, AND CHIEF EXECUTIVE OFFICER, LOCKHEED MARTIN CORPORATION

Mr. TAICLET. Chairman Gallagher, Ranking Member Khanna in absentia, distinguished members of the subcommittee, thank you for the opportunity to testify today [on] the potential for innovation to bolster deterrence and advance 21st century security for the United States and our allies.

It's an honor to represent our company's 116,000 employees who are focused on delivering innovative solutions that help deter armed conflict and keep our country safe. I take this responsibility personally.

After graduating from the Air Force Academy I began my career as a pilot, logging more than 5,000 flight hours in a variety of aircraft including the Lockheed Martin C–141B Starlifter, and I flew the first units of the 82nd Airborne into Saudi Arabia the first night of Desert Storm, among other missions.

So my experience is a constant reminder of our responsibility to provide the most advanced technologies, both physical and digital, for our service members on the front lines of defending freedom.

After the Gulf war I entered the private sector and during my 20 years in the telecommunications industry as a CEO of American Tower Corporation we helped lead the transformative advancements in mobile networks from 2G through 5G.

In 2018 I returned to the aerospace industry as a Lockheed Martin board member, bringing that firsthand experience of tech capabilities that had the potential to advance the National Defense Strategy.

I felt that our company could serve as a catalyst to bring the best of aerospace and defense industry and commercial technology and telecom industry together to serve the national interest.

Now as CEO of the company we're leveraging our position as the largest aerospace and defense business in the world to be a pathfinder for what we call 21st century security.

This initiative is about harnessing digital technologies like 5G, AI [artificial intelligence], and distributed cloud computing into the national defense enterprise to deliver more advanced capabilities faster and with greater value for integrated deterrence.

Civil and military leaders agree that the U.S. is facing increasing aggressive peer threats, as you said, Mr. Chairman, perennial budget constraints, too, and an acceleration of commercially driven technology, all of which call for new approaches to acquisition and military operations.

Together the Department of Defense, Congress, the defense industry, and the commercial technology sector can push the boundaries of innovation, technology, and interoperability in ways our adversaries can't match, with the ultimate goal of deterring great power conflict. I strongly advocate three priorities to achieve this goal.

First, it's critical that we apply anti-fragility measures to increase industry's ability to quickly ramp production of key systems. Impacts from the COVID–19 pandemic coinciding with Russia's invasion of Ukraine revealed fragility within the defense industrial base.

Upfront investment designed to ramp emergency or wartime production rates to two standard deviations above the mean of peacetime production will ensure the defense industrial base can withstand shocks, stressors, and outside factors.

Second, we must aggressively adopt and insert 21st century digital technologies into the defense industry. To jumpstart this effort, Lockheed Martin has been partnering with some of the most prominent commercial technology companies like Microsoft, Nvidia, Verizon, and Intel.

We also work with small startups through our Lockheed Martin Ventures organization and now with mid-sized companies through our Lockheed Martin Evolve team to bring nontraditional partners into the defense industry.

Our partnerships have already developed cutting-edge solutions for the Department of Defense and I look forward to sharing details on our progress today.

But this must be a larger team effort, which is why we will continue to advance a standards-based open architecture approach to this similar to what the telecom industry established.

This approach will enable the U.S., our allies, defense companies, suppliers and startups alike, to work from a common framework to develop this technology.

Lastly, throughout history the U.S. military has been made stronger through its constellation of trusted allies and partners. The defense industrial base is no different and so we're committed to supporting international security cooperation objectives by streamlining foreign military sales, direct commercial sales, et cetera.

But I believe these three lines of effort will set the defense industrial base on a path to maintain Western technology superiority well into the 21st century and beyond.

Thank you again for the opportunity to testify on behalf of Lockheed Martin and our team and thank you for your many years of support for our workforce and our programs.

The increasingly sophisticated threats we face provide a stark reminder of the urgent need for action and we stand ready to partner with you.

I welcome any questions you may have.

[The prepared statement of Mr. Taiclet can be found in the Appendix on page 37.]

Mr. GALLAGHER. Thank you.

Mr. Khanna, do you have a comment you'd like to offer now before I move to the next witness?

STATEMENT OF HON. RO KHANNA, A REPRESENTATIVE FROM CALIFORNIA, RANKING MEMBER, SUBCOMMITTEE ON CYBER, INFORMATION TECHNOLOGIES, AND INNOVATION

Mr. KHANNA. Thank you, Mr. Chairman. I apologize for having to take that call. I appreciate your leadership and your convening this hearing, and thank you to our witnesses for appearing before the committee this morning.

We appreciate your time to help provide this committee with your insights on the state of the Department's innovation ecosystem. This committee has a long history of pushing and providing

new authorities in order to support a more agile and innovative Department.

Our committee needs to help ensure our Department has the ability to keep up with the rapidly advancing pace of innovation in the private sector. Many legacy structures are not equipped to handle these challenges and the committee hopes to hear from each member about areas where Congress may need to reconsider past action.

This committee including the chairman is deeply concerned about the state and resources of our test range and facilities, especially as we intensify our focus on areas like hypersonics, AI, and energy and automation.

Given your company's involvement, your insights are invaluable. I would like to say that I share the chairman's disappointment about Raytheon not showing up to the hearing. I have questions about Raytheon's involvement in China that I want to get answered, what they're manufacturing there, if anything, and I also have concerns about any of our reliance on China or overseas defense production that I hope we can get into in this committee.

Thank you, Mr. Chairman, for your leadership and thank you for the witnesses who did have the courtesy to appear before the United States Congress.

Mr. GALLAGHER. I thank the ranking member and I now recognize Mr. Schimpf for 5 minutes.

STATEMENT OF BRIAN SCHIMPF, CO–FOUNDER AND CHIEF EXECUTIVE OFFICER, ANDURIL INDUSTRIES

Mr. SCHIMPF. Chairman Gallagher, Ranking Member Khanna, members of the subcommittee, thank you for your opportunity to testify.

I'm honored to represent Anduril and our team. Anduril was founded in 2017 to deliver software-defined technology to the military. Thanks to your leadership, the policies and authorities needed to deliver innovative solutions have improved significantly. We no longer debate whether innovation is needed. Instead, the issue now is how to accomplish it.

The key to success is incentivizing production of large quantities of the right capabilities across all domains. Our ability to project military power is overly reliant on a small number of exquisite systems that our industrial base struggles to build at relevant scale and speed.

Anduril is building software-defined and hardware-enabled platforms to field an arsenal of smaller, lower cost, autonomous systems that can be produced at scale, field rapidly to U.S. forces, and transferred to allies and partners.

At Anduril we call this approach rebooting the arsenal of democracy. The United States cannot build the arsenal the same way we did in the 1940s nor can the country succeed through incremental changes to a legacy system.

Instead, the government must use market principles to leverage the power of software, the talent of the American workforce, and the ingenuity of public servants to change the way we deliver and deploy defense technologies.

Tinkering with the existing acquisition system will not succeed. We must reboot it. This approach should inform defense policy in the following ways.

The government can innovate through acts of buying at scale. Exquisite assets certainly play an important role in defense. However, the United States must augment those assets with new items responsive to market forces the Department can effect.

We will never see a true marketplace for aircraft carriers but the Department can absolutely have one for sensors, satellite constellations, autonomous undersea vehicles, air defense systems, or precision strike munitions.

Acquiring these autonomous consumable capabilities now should be a priority. They will enable the Department to deter competitors who may be tempted to attack before we can mobilize the industrial base to respond.

Incentivizing competition is the core of this approach. By competition I mean genuine, ruthless competition amongst serious bidders providing mature capabilities, not paper submissions.

These competitions should be product-driven bake-offs and they should end in meaningful production awards. Markets arise in response to production opportunities. Fair and frequent competitions for large contracts force companies to earn the government's business and to deliver high value at low cost.

New and innovative companies will compete, including on price. By developing capabilities on our own dime and not relying on cost-type contracts, our capabilities shift the risk off the government and the taxpayer.

Congress has done yeoman's work to make this new framework a reality. It has never been easier for a new company to get research or prototype funding. The policies I've discussed today focus on the next phase, how to scale capabilities from prototype to production.

The APFIT [Accelerate the Procurement and Fielding of Innovative Technologies] program and the software acquisition pilots are great steps. So are the provisions in this year's NDAA [National Defense Authorization Act] including ones focused on rapid competitions and the nontraditional innovation fielding exercise.

By building on this work Congress can encourage more companies to work on defense technology by stimulating real performance-based awards. You can drive innovation with these principles.

First, focus on the bottom line. Competitions must test the ability to solve a pressing operational problem.

Second, empower decision makers to manage competitions and reward success. Always have a meaningful contract at the end and issue it quickly.

Third, re-compete key programs frequently. Companies will invest if there's an opportunity to succeed.

And finally, measure outputs, not inputs. Ask how many competitions led to meaningful solutions and how quickly they delivered. With the right incentives and with your continued leadership the Department can reap the benefits of this model.

U.S. and allied warfighters will be equipped for overmatch and the United States can maintain the leadership position that has ensured prosperity and peace.

Thank you once again, and I look forward to your questions.

[The prepared statement of Mr. Schimpf can be found in the Appendix on page 53.]

Mr. GALLAGHER. Thank you, Mr. Schimpf.

Mr. Jenkins, you are recognized for 5 minutes.

STATEMENT OF RICHARD JENKINS, FOUNDER AND CHIEF EXECUTIVE OFFICER, SAILDRONE, INC.

Mr. JENKINS. Thank you, Chairman Gallagher, Ranking Member Khanna, and members of the subcommittee for providing me the opportunity to testify today and discuss how the U.S. commercial sector is working with DOD [Department of Defense] with new technologies.

I'm the founder and chief executive of Saildrone, a U.S. company based in Alameda, California. Saildrone is a world leader in long endurance autonomous unmanned surface vehicles.

Our fleet has sailed over 1 million nautical miles during more than 30,000 days at sea from the Arctic to the Southern Ocean. Our vehicles carry sophisticated sensors that collect data that support a wide range of U.S. Government agencies such as NOAA [National Oceanic and Atmospheric Administration], NASA [National Aeronautics and Space Administration], DOE [Department of Energy], Coast Guard, CBP [Customs and Border Protection], and the DOD.

Large volumes of data are collected on our vehicles and processed aboard our vehicles using machine learning and AI algorithms. Intelligence is then transmitted off the vehicles in near real time using satellite connections.

Rapidly increasing illegal fishing, narcotics trafficking, and migrant crossings combined with our growing adversarial threats means there has never been a greater need for distributed maritime domain awareness, a need that unmanned autonomous systems in large numbers will likely play a major role in filling.

We traditionally operate in the COCO model, contractor owned and operated, providing data as a service to our government customers. The COCO model enables rapid prototyping and testing and does not require a large budget for up front procurement. I believe the COCO model is a perfect solution for the rapid fielding of new technologies.

However, we're absolutely open to procurement models such as GOCO, government owned and contractor operated, which may make sense for some long-term applications.

Saildrone has had a close relationship with DIU [Defense Innovation Unit] since the beginning. In fact, it was the first recipient of one of the first contracts issued by DIUx [Defense Innovation Unit Experimental] back in 2015. DIU has been transformational in enabling rapid contracting and experimentation, and I'm very grateful for the assistance of bringing commercial technology to bear in the DOD space.

I'm excited to see the next generation of DIU under Doug Beck. More recently we have worked with the Unmanned Task Force. The UTF has taken a nontraditional approach to sourcing new vendors and facilitating projects with Task Force 59, which has done

a fantastic job in rapidly evaluating commercial technologies in real operating conditions with real adversaries.

I'd also like to acknowledge Admiral Gilday and Secretary Del Toro's significant recent announcements to accelerate transition of mission-ready unmanned systems such as Saildrone into operational fleet use.

Under their path maker framework the next-gen team PMS [Program Manager, Ships] 420 delivered a contract in just 29 days. Forty-five days after contract awards Saildrone deployed a fleet of 10 Voyager USVs [unmanned surface vessels] in Naval Air Station Key West.

Just 10 weeks of initiation to deployment for a new fleet is a phenomenally fast timeline. Ten Saildrones will be performing counternarcotics and maritime domain awareness for 4th Fleet over the next year in the SOUTHCOM [U.S. Southern Command] AOR [area of responsibility]. I have high confidence that momentum will continue under Admiral Franchetti's leadership.

These are just a few examples of successful initiatives advancing commercial, unmanned, and AI systems in DOD operations. I'm also very excited by the recent announcement of the DCO—Disruptive Capabilities Office—and the Replicator program.

However, what is not clear to me is how these and other efforts will get funded and at what scale. While commercial companies like Saildrone can scale quickly and have tremendous utility to bring the warfighter in the near term, there is still no clear path for transitioning proven technologies into scaled recurring operations other than the traditional POM [Program Objective Memorandum] process, which is a 2- to 3-year effort.

Given the speed and direction of our adversaries, I'd argue we don't have 2 to 3 years to make these decisions. We need to move faster, get new technologies into the hands of our combatant commands at a meaningful scale and a meaningful length of time. Only after 1 to 2 years of continuous operational experience would we likely have a rugged concert of operations to be ready to engage an adversary if required.

Thank you.

[The prepared statement of Mr. Jenkins can be found in the Appendix on page 63.]

Mr. GALLAGHER. Thank you very much. We'll now move to questions. I'll start with myself.

Recently a major defense CEO stated that it's important to understand that we have to find a way to get along with China and that we cannot decouple from China.

I understand we have a very complex economic relationship with China. Everyone's supply chain, you know, isn't—you know, runs through China in some—in some sense. Well, not everybody's but a lot of major companies.

But I'd be curious, since you all are in the business of building weapons systems designed to sink Chinese ships and aircraft, how you think about that—how you think about that statement and then how you think about your own supply chains and ensuring that they can withstand economic coercion from the Chinese Communist Party.

Maybe, Mr. Taiclet, we'll start with you.

Mr. TAICLET. Certainly, Mr. Chairman. I'm in the camp that believes that China is competing aggressively against the United States and our allies. They have a different system than we do.

They drive a dual circulation economy, which intends to make us more dependent on them and them less dependent on us, and they practice civil-military fusion, which basically demands and commands the commercial industries in China to devote their technologies and pipeline their capabilities into their PLA—People's Liberation Army.

That's who we're competing with and they're using all the means they can to drive that competition. I think we want to use and preserve our system but also to basically marshal all of American industry from startups to the biggest aerospace companies in the world and the biggest technology companies in the world that are on our side, so to speak, to get together and face this soberly and face it together in a way that government can lead but it can't create all the solutions.

So we want to work with all of industry in our system to be able to compete effectively with what's going on in China and Russia and other countries.

Mr. GALLAGHER. Mr. Schimpf, your thoughts on getting along with China and defense decoupling from China?

Mr. SCHIMPF. The challenge with the U.S. supply base is that it's often very fractured and when you look at where a lot of the components and pieces come from they're frequently made by small-sized companies, many of whom are entering—the owners are entering the age of retirement.

So the U.S. industrial base needs active development, active investment, and there are significant capabilities that do exist frequently in more of the commercial manufacturing world but those have often not been what's supplying technology to the defense base.

Our view has been to go above and beyond on removing China from the supply chain. We have, you know, basically eliminated nearly every part possible that we can get away from, gone above and beyond to source everything we can from U.S. and allied manufacturing sources.

But it's a significant challenge and often the capacity within the U.S. does not exist. And this has taken significant investment on our part to either bring things in house or find and invest in those partners that can scale with what is needed.

This is an area where I think the Department and Congress can have a significant positive impact. They can take advantage of things like DPA [Defense Production Act] to invest in technologies, invest in capacity that needs to exist to support what we need to do.

They can take advantage of, you know, just buying and supporting the industrial base through production to stimulate and activate what needs to exist. But it's not something that will happen on its own.

It will require active investment and active steering to get the U.S. to the point that we have restored the industrial capacity that we have essentially outsourced over the last several decades.

Mr. GALLAGHER. Thank you.

Same question, Mr. Jenkins. Is your microphone on? Sorry.

Mr. JENKINS. Sorry. I'd agree with that.

I would like to call out China's very successful use of leveraging commercial, civilian, and transport technologies in military applications.

I think the U.S. needs to do a much better job of enhancing and embracing civilian and commercial technologies in the defense realm. I'll also point out you mentioned weapons. I think it's a lot more than just weapons. It's an information war as well.

Saildrone doesn't weaponize platforms at this stage but we do collect critical ISR [intelligence, surveillance, and reconnaissance] data. So I think people often overlook the need for precision, accurate, truthful data in order to inform decisions we make with weapons.

Mr. GALLAGHER. I appreciate that. I have more questions I hope to get to in a second round. I just want to comment—having just done a war game exercise in New York with major asset managers and CEOs of various banks in the other committee I work on, the Select Committee on China.

The big takeaway—we examined a 2028 Taiwan scenario—was that as difficult as these questions of how to selectively decouple, and reasonable people can argue about where to draw the line for decoupling—as difficult as those decisions are right now politically, practically, financially, if we don't do some version of that our options are extremely limited if we find ourselves in a war with China in 5 years and they dominate the production of the processing of critical minerals, the production of lifesaving drugs.

Take your pick of things they could threaten to cut off and bring us to our knees as they have threatened to cut off the export of APIs [active pharmaceutical ingredients] in the early part of the pandemic.

So figuring out how to decouple in a smart and selective way I would argue is essential for the health of our defense industrial base as well as our country by extension.

I've gone over my time. I recognize Mr. Khanna.

Mr. KHANNA. Thank you, Mr. Chairman.

Mr. Taiclet, I've been trying to get an understanding from the Pentagon about how much our defense supply is coming from China, if at all. Is any part that Lockheed Martin makes do you rely on something coming from China?

Mr. TAICLET. Ranking Member Khanna, our approach to the supply chain is similar to Mr. Schimpf, which is we try to eliminate any and all parts, components, and materials even from China sources. So we are in compliance with the Federal Acquisition Regulation.

There are some waivers to that regulation based on, as Chairman Gallagher pointed out, the unavailability of certain materials.

Mr. KHANNA. And what are those materials?

Mr. TAICLET. Some of them are rare earth elements, as was pointed out prior. Those rare earth elements are in the material stage generally. In other words, they cannot be spoofed, hacked, used for cyber.

Mr. KHANNA. Anything else other than rare earth?

Mr. TAICLET. There's been a few small part components, again, very kind of—the type of things that you find almost at a hardware store, so to speak, that are sold through distributors.

So once we get supply chain illumination into the second, third, fourth, fifth levels of our supply chain we can find some of these components and, again, sort of dumb devices, I'll call them.

Mr. KHANNA. Is there a reason that small components we can't do in the United States? I mean, do you think we should have an initiative to have that made here?

Mr. TAICLET. Yes. I totally agree with my colleague here that we should attempt to eliminate every dependency on any defense production for a component, subcomponent, material out of China. Absolutely yes.

Mr. KHANNA. I'd love to work with you on that. I think that's a bipartisan issue and I know the chairman has shown leadership. I know you may be reluctant to comment on Raytheon but all the articles I read I can't make sense of whether they do have things they're manufacturing in China, whether they don't, what is it they're manufacturing in China. And, of course, we don't have Raytheon here to answer.

Do you have a sense of what—or and I'll ask Mr. Schimpf and Mr. Jenkins, too—what their dependency is on China. Is it just civilian things they're making there? Are there military components?

Mr. TAICLET. We only have visibility to components that Raytheon or its subsidiaries would supply to us and I don't have visibility at my level on anything that is China sourced.

But I cannot speak for Raytheon and I'll actually, for the record, ask my team to specify any exposures that we're aware of, Congressman, and we'll put that in the record.

[The information referred to can be found in the Appendix on page 81.]

Mr. KHANNA. Thank you.

Mr. Jenkins or Mr. Schimpf, do you have any sense of these articles we read about Raytheon? I mean, it's been so public that they still have supply in China, whether they're talking about civilian, military components.

Mr. JENKINS. I do not, no. Saildrone only exclusively uses materials from the U.S.

Mr. SCHIMPF. I don't have any specific knowledge of Raytheon but one good example I'll point out on where I think congressional action has substantially helped the U.S. supply chain is in battery technologies.

So the—you know, the recent Acts that have provided subsidized support to U.S. battery manufacturing capacity have changed the economics so substantially that where China had a decisive advantage in this now it is uneconomic to not produce in the U.S.

So companies are making massive investments into the U.S. industrial capacity to support battery production. These are the types of areas where I think Congress can substantially improve U.S. competitive position and identify key supply chain gaps that we need to eliminate that are very strategic.

Mr. KHANNA. Mr. Schimpf, what would be your top recommendations for this committee in terms of making it easier for the Department of Defense to develop innovative technologies?

I know the chairman has worked on eliminating a lot of the roadblocks. But if you had to say one or two more things we could do what would you recommend?

Mr. SCHIMPF. The number-one limitation right now is very simple, which is actually buying and fielding these technologies. Often, it takes a very measured, slow approach to how we actually get these technologies out and does not hit a point of scale where the system is able to respond.

We have seen fantastic progress from the Air Force where Secretary Kendall is doing a phenomenal job thinking about how would we operate with a thousand or 2,000 collaborative combat aircraft—loyal wingman aircraft. That type of framing substantially changes where the industry invests, gives an opportunity for venture investors to see why and where they should allocate their money to get return, and get efficient capital allocation.

So I think these areas where there's actual adoption at scale is absolutely the single most critical thing and that is what is lacking the most right now.

Mr. KHANNA. Thank you. Thank you, Mr. Chair.

Mr. GALLAGHER. We got to come back to that too because—and I expose my ignorance on this. I always feel like we get to this point where that's the solution. We just need DOD to, like, make bigger bets on a smaller number of technologies.

But why can't they do that? We have given them the authorities. Is it that they don't have the appropriation? Is it that they're risk averse? Like, what do we need to do? Like, do we need to legislate?

Do we need to force them to do this thing? Otherwise, we're just giving out SBIRs [Small Business Innovation Research] participation trophies. We always get to this point.

So I'm going to plant a flag there and come back to it, hopefully, in a second round.

Mr. Strong is recognized for 5 minutes.

Mr. STRONG. Thank you, Chairman Gallagher.

I appreciate all the witnesses for being here today and your company's investment in the greater State of Alabama and what you do for our country.

Mr. Taiclet, back in 2019 the Army tasked its Rapid Capabilities and Critical Technologies Office, more affectionately known as RCCTO, with fielding a combat-capable long-range hypersonic weapon before the end of year 2023.

This was an important announcement for north Alabama since RCCTO is headquartered there at Redstone Arsenal. Then Lockheed Martin Courtland and Dynetics of Huntsville, a homegrown company from the "Rocket City," were named the program's prime contractors.

I know that the latest tests for Dark Eagle were scrubbed but the collection of hardware and software performance was successful. I've said it before and I'll say it again. It's okay to fail, just fail fast and as cheaply as possible.

This being said, Mr. Taiclet, I have two questions for you. How was RCCTO approach to Dark Eagles different than your standard state-of-the-art technology?

Mr. TAICLET. The Army has been innovative along with the Navy, I should add, in hypersonic strike and for the first time in

this particular realm they've gotten together and were using the same—Congressman, were using the same vehicle, if you will, for the Army and the Navy.

The launch systems are different. The Navy's will come from a destroyer and/or submarine as we roll that system out. The Army's will come from a land vehicle.

The first that will be deployed will be the land vehicle system and we hope to have it operational in collaboration with the Army, again, by the end of calendar year 2023.

Mr. STRONG. Thank you. Can you speak to the importance of testing as early and often as possible when it comes to highly advanced systems like this?

Mr. TAICLET. Yes. And so I think one lesson learned from the last 20 years of hypersonic development which we have been involved with as a company is that there's been stops, starts, funding, defunding of hypersonic test capacity and test activities while China—and Russia to a lesser extent but China certainly has kept a rapid pace of testing, to your point, over many decades and they've actually got some fielded capabilities we have seen.

Now, we're back to remedying that, I believe, over the last 5 years or so. The industry is investing in hypersonics. I've been to Courtland twice myself.

We stood up a brand new facility for that with the support of the government, and so I think we're on pace now to be very competitive in hypersonic strike.

Mr. STRONG. Thank you.

Mr. Schimpf, I was proud to see you hire my neighbor, longtime friend, and the first RCCTO director, Lieutenant General Neil Thurgood as Anduril's senior vice president earlier this year. He's a true patriot and he mashed the gas pedal when it came to hypersonics as a three-star general.

This coupled with many companies' acquisitions of [Andranos] is great news for both the Rocket City and the solid rocket motor industry. This seems like a great example of defense innovation. Can you tell us more about the acquisition and the innovation involved?

Mr. SCHIMPF. Thank you, Congressman. Absolutely.

So we have—we looked at the industrial base and one of the most critical gaps that we saw was production of solid rocket motors. We have heard it from the primes, we have heard it from the government, where this is a major gap in our ability to produce and scale weapons that we critically need.

When we looked across the industry we found one company that had the ability to produce at scale, had the facilities necessary, and had novel technology to actually do that. We're investing heavily to get that technology as ramped as possible to add as much capacity to the industrial base as possible, and additionally we're looking to the government to help facilitate that investment as well.

So anywhere we can create leverage to accelerate the capacity we can bring to market, that's absolutely critical and it's an area where I think Congress can add very specific emphasis into the U.S. industrial base and grow it very, very quickly.

Mr. STRONG. Thank you.

Mr. Jenkins, Saildrone might not be in Huntsville but it is in Alabama and we stick together. I had a chance to see some of the

company's work with Austal USA in Mobile and it seems to be quite an impressive partnership.

Since 2021 Saildrone has operated as part of the Navy's 5th Fleet Task Force 59, demonstrating the ability of uncrewed systems to augment traditional manned assets and provide a fuller, calmer operation picture for all sea services.

When it comes to AI and leveraging uncrewed systems in contested environments, I have time for one question. What lesson has Saildrone learned over the past few years that could be applied across the joint forces?

Mr. JENKINS. Thank you. So we have learned that the amount of data we collect the data is now overwhelming our customers. There's so much information to be gleaned from the ocean be it above the water, below the water, acoustics, et cetera.

We're using AI extensively on the vehicles and in the cloud to produce real intelligence for the warfighter.

So the real learning here is that the government does not have—the customer does not have the ability to absorb the volume of raw data we're giving and AI will be a critical component in delivering real intelligence which is actionable to the services.

Mr. STRONG. Thank you. Mr. Chairman, I yield back.

Mr. GALLAGHER. I love that your questions are always like this shameless commercial for Alabama. It's——

Mr. STRONG. I have no shame. I appreciate what you all do for our State.

Mr. GALLAGHER. Hey, well, if you can't root for good football teams you got to root for other stuff.

Mr. STRONG. I'm an Auburn guy. I'm not for Alabama.

Mr. GALLAGHER. Mr. Ryan.

Mr. RYAN. Thank you, Mr. Chair. Thank you all for being here and all the work that you're doing in our collective defense—towards our collective defense.

I want to build actually on what—sort of where Chairman Gallagher was going, where Mr. Schimpf was going, specifically focused on the Replicator program. In late August, as we all know, Deputy Secretary Hicks announced this new initiative to field all-domain attritable autonomous systems at large scale across multiple domains within 2 years—very exciting—in theory.

It seems—and you hit specifically on this in your opening testimony as well, Mr. Jenkins—sounds great but you—what you said really stuck with me. We don't really understand where is the money, where are the programs, where are the resources?

How do we allocate and decide internally to really go all in on this if there's not clear demand signal with clear returns for you all.

So I want to ask everybody to sort of weigh in there starting with you, Mr. Schimpf, because you sort of brought this up last. What needs to be done? And let's just use Replicator—I know it's just one program—but as an example of the broader focus.

I'll follow up where Mr. Gallagher was. What do we need to push them to do? Because I think everybody on this subcommittee certainly wants to see that succeed, wants to see that timeline hit or faster but share concerns that unless we're very specific we won't get there.

Mr. SCHIMPF. Yes. So I—thank you, Congressman. The base—the funding key—funding is kind of the key lever of this, which is, you know, with the traditional defense acquisition system everything is sort of very allocated years in advance.

So the ability for the DOD to even respond and reallocate funding very quickly against these at the scale that is necessary is very, very limited. I think, you know, language that is put in on the nontraditional innovation fielding enterprise is one of the—the funding that has been appropriated on that in HAC–D [House Appropriations Committee, Subcommittee on Defense] is a very compelling way to start to solve this problem.

In particular, they're looking at commercial solutions that can be deployed in, you know, 12 to 24 months, having that as a criteria of how these things are actually deployed, where the money is spent.

And I think another area that is very critical is sort of concentration of that bet. So the typical pattern we have seen is often spreading those pools of money across 40 different investments, leading to small-scale experimentation.

There are many good ideas within the DOD. There are many good technologies that could be scaled. But hard choices will have to be made on what is the most effective.

So areas where Congress can push on both providing flexible funding, tying it to quick turn results, and focusing the Department on concentrated bets and making that clear, I think, can lead to some of the biggest impacts possible rather than seeing what we have seen, which is kind of a continued spreading of, you know, all of the investment across a very, very wide base, leading to no scale and no impact.

Mr. RYAN. Thank you. Thank you.

Anything to add, Mr. Jenkins?

Mr. JENKINS. I would agree with that, and we're seeing large sums of money being divided through a large number of programs that doesn't lead to a meaningful outcome. I will say that if you want to act in the next 12 to 18, 24 months you've got to start building now.

If we can go build functions in a year, what the government often does is deliberate for 8 to 12 months and then says, can you give them tomorrow, and the answer is no.

It takes time to scale up manufacturing plants, operations, hire people, supply chain. You got to buy components. You know, we need to start building today. So I would argue or ask, you know, what is the size of that budget? What is the plan and how soon can we know?

Mr. RYAN. And just to follow up for anyone, to your—to your point, Mr. Schimpf, from your estimation, what you're seeing in the field, what you're sort of brainstorming and thinking about contingencies to the topic of deterrence in this subcommittee, is Replicator that right bet?

I mean, is that—in your opinions is that one of those places we should go sort of strong and heavy?

Mr. SCHIMPF. I absolutely believe that there is—mass is going to be the determining quality that really matters on this. You know, the number of systems we can field, the rate we can replenish

them, the volume we can get, you know, kind of prepositioned and ready and demonstrate that we have that capacity is absolutely critical to creating deterrence. And I think there's a number of technologies that can provide a huge amount of uncertainty and, you know, kind of hesitation on the part of the CCP [Chinese Communist Party].

I think—you know, we have invested heavily in undersea capabilities, for example, which I think is a great example of exactly where this needs to go, where that is a domain that the U.S. has huge advantage and, you know, while the U.S. must continue to invest in shipbuilding capacity we are unlikely to see the returns of those investments for the next few years.

Mr. RYAN. Thank you. I yield back, Mr. Chair.

Mr. GALLAGHER. Thank you.

Mr. Luttrell.

Mr. LUTTRELL. Thank you, Mr. Chairman.

Let's fast forward the clock a little bit and talk actuality and let's just say something happens that we hope does not happen.

Mr. Taiclet, on the F–35 or just the aircraft series that we're producing right now, to piggyback off my colleague, if there are materials that are needed for that aircraft—and I wish we could get it at a hardware store. That would be great.

But what are we looking at if this goes full scale Armageddon? Mr. DeLuzio, sir, you're in my way.

[Laughter.]

Mr. GALLAGHER. He did that on purpose.

Mr. LUTTRELL. I know he did it on purpose.

Mr. GALLAGHER. Sabotage.

Mr. TAICLET. So Congressman Luttrell, I can assure you the F–35 production line will not be interrupted in any near-term sense if there was a complete embargo of goods coming from China.

Part of the safety net here is that these basic materials and basic components are themselves distributed through three or four layers of distribution system. In other words, a Chinese company will sell 10,000 capacitors into the market. Those will go to automotive. They'll go to commercial aerospace. They'll go to distributors that serve the defense industry.

Those are almost impossible to track from either the supplier, assuming one would come from China, and the buyer. What we're trying to do now from the buyer side as an industry—and government is involved in this and DOD—is illuminate as much of that supply chain as we can see and make sure there is just no stone left unturned where there's anything that could be used against our defense production system.

Mr. LUTTRELL. And with hypersonic capabilities I know we're third tier maybe. I'd hate to think we're any lower than that. But one of my biggest concerns is their ability and capability to reach out and touch us without us having any preventive maintenance—or measures in place.

And I know that—from what I've been able to be a part of I know we're not there yet. Do you see any—and I agree with the money. The money seems to be everything that's holding industry back to bringing those capabilities to the—to the front line.

Are you comfortable in any way saying that if something was to go off any—in the near future do we have any capabilities in the hypersonic space to keep up with our—the nefarious actors across the pond?

Mr. TAICLET. We do in the realm of hypersonic defense. So a lot of the existing systems, which is something I would like to come back to later, is how do you leverage existing systems, in this case, the Patriot missile system, to be able to deal with a more advanced threat using software and advanced networking technologies before you can build a new hardware system in 6, 8, 10 years.

So we have done that with Patriot and the Patriot missiles that have been deployed in Ukraine have actually shot down hypersonic weapons fired from—by and from Russia. There will be a cat and mouse game that will continue here because the more sophisticated the maneuvering in the final terminal stage that the missile can go, the tougher it's going to be to hit it.

But we're actually in the cat and mouse game on hypersonic defense already and I would say that is—that is a significant deterrent. But we need the offensive side of the deterrent as well, which has been spoken to earlier, and to accelerate the hypersonic development and accept test failures—they are going to happen because we're rapidly developing these programs—and continue to make sure that they're going to get fielded, in which in the case of the Army and Navy we're well on our way.

Mr. LUTTRELL. Okay.

Mr. Jenkins, with data collection and data aggregation, computational analytics from your—from everything that you have forward deployed mostly—is it all or mostly just rare earth mineral battery powered or is there a variation.

Mr. JENKINS. On propulsion?

Mr. LUTTRELL. Yes, sir.

Mr. JENKINS. We use wind and solar for main propulsion and also have onboard engines with diesel. So we have very long endurance due to the wind power, harnessing renewables. That gets us 12 months in the open ocean.

For the high-power devices that we run—we run sonars, we run mapping, we run multibeams—they require an engine onboard—a generator. So we have fuel in the form of diesel to supplement that.

Mr. LUTTRELL. This may or may not be a question you can answer in this setting but given the vastness of just the open waters across the globe and those that we're probably most likely going to be engaged in, one of the trickiest parts, in my opinion—and I used to be an undersea guy, so—is mapping and channelizing everything that's happening underneath the waters that we can't see.

My question is do we—do you all have the capabilities, I guess, to cast a proverbial net in order to help the United States if, and, or when something goes off?

Mr. JENKINS. We do. So Saildrone is a very flexible platform where you can apply any sensor. So we have large-scale multibeam systems that can map the seabed to the same accuracy or better than the Navy's best ships. We have sensors that carry multibeam [inaudible] ships.

So we believe in not displacing ships but freeing up ship time. So if you can free up the more remedial jobs—the mapping, the [in-

audible] for the ship—you can actually buy yourself considerably more ship time with the existing fleet.

So yes, we operate multibeams. We operate acoustics, eyes and ears above and below the surface to significantly give us intel when they are forward deployed.

You mentioned range. I'd also mention that the challenge we face in the Western Pacific, you know, it is 3,000, 4,000, 5,000 miles away. You need very long endurance vehicles to do that and that's going to be a key part of the technology, going forward.

Mr. LUTTRELL. Yes sir. Thank you.

Mr. GALLAGHER. Thank you. Mr. Deluzio is recognized for 5 minutes.

Mr. DELUZIO. Mr. Chairman, thank you, and, gentlemen, thank you for being here.

Mr. Schimpf, I want to come back to something you had mentioned with Mr. Khanna earlier about batteries and what the market domestically now looks like.

Tell me a bit more. What can we learn from this kind of Federal action, how you're seeing it play out in the defense industrial base?

Mr. SCHIMPF. Thank you, Congressman. One of the areas we have seen is, you know—and this is even beyond the defense industrial base, talking with a number of colleagues who have started different companies—the access to, you know, low-cost loans that are guaranteed to facilitize some scale production; the ability to, you know, kind of get grants to develop and mature up technologies. That has changed the cost basis in a way that now production inside the U.S. is offset in a way that historically it was so much cheaper to do it in China because of their incentives and their, you know, sort of industrial policy that they had in place.

So that's an area where I think the economic incentives were very straightforward. They were—you know, were able to offset a lot of the very large costs involved in scaling up production capacity as well as investing in research and development technology for next-generation capabilities.

I think in the defense base the same analog applies. There's a number of areas where, because of straightforward economic reasons, production has moved overseas. It has atrophied. The volume is not there to sustain the U.S. industrial base on the types of components that we really need to be successful here.

So I think some of the actions that Mr. Taiclet referenced, being able to identify those key supply chain areas and have a proactive approach to industrial policy in the defense space, is absolutely critical to having the resilience and scalability that we need and be able to be as responsive as the U.S. demands.

Mr. DELUZIO. Thank you.

Gentlemen, anything you'd like to add to that question? Okay.

Mr. Jenkins, we come to you. So in your testimony I think you said it as well. Being able to assemble and ship 10 of your Voyager vessels to the Navy within 5 weeks of being placed in a contract that's pretty fast.

Now, I understand not every weapon system is—that's realistic but what can we learn from what you are doing that we can scale up for bigger, more complex systems or systems like yours?

Mr. JENKINS. Yeah, thanks for the question.

So repeatability is key. Our systems are modular, they're scalable, easy to service, and they're light to deploy. So having small attritable systems rather than very large ships it generally gives you more mobility and agility. So small, light, relatively cheap, high-utility systems is where we focus.

Mr. DELUZIO. Are there procurement lessons we can glean, though, for our larger systems based on what you are doing and those like you, right, who are relying on smaller, more nimble modular systems?

Mr. JENKINS. Yes. I mean, again, the procurement system needs significant work to make it faster across the board. There is a term "the frozen middle." It's a real thing.

You might get someone to request a service but getting the contract through the building to the other side is still a heavy lift. So I think significant work. While we do see glimmers of hope out of NAVSEA [Naval Sea Systems Command] I think there's work to be done there.

Mr. DELUZIO. Thank you. And then, Mr. Taiclet, I'll come to you last. You had a note in your—or a line in your testimony that caught my eye about the need for multiple reliable sources for things from semiconductor, solid rocket motors, rare earth elements. I agree.

You know, you have some suggestions. Use as much time as you'd like. What can we be doing to grow competition within all of those components, sectors, you name it?

Mr. TAICLET. Certainly, Congressman.

What we have tried to take is an approach called the concept of anti-fragility in our defense industrial base. Fragility is the risk or the disruption or even the failure of a system when it is affected by an outside shock.

So COVID–19, tripling ramping production, those kinds of things. Nassim Taleb created this concept called anti-fragility. He wrote "The Black Swan" and then a second book called "Anti-Fragility."

That concept basically says you can design into a system a relatively low-cost set of parameters that will allow that system to if not be strengthened by being shocked it will be resilient when it gets shocked.

And so some of the things that would apply to your question would be having multiple sources for supplies. So when we have a component that will go into, say, an aircraft, F–35, we have to qualify that supplier.

We want to make sure that component is going to work, that it's going to be cyber secure, et cetera. It's going to cost money to get that second supplier.

And so, therefore, there's a cost to anti-fragility that should be taken——

Mr. DELUZIO. Can I ask a quick follow-up?

Mr. TAICLET. Sure.

Mr. DELUZIO. And do you tend to pay less when there are competing bids than if you have a single supplier?

Mr. TAICLET. Well, yes. Right. And so the more suppliers we have the more optionality we are going to get in negotiation. That's true. But there is some upfront cost to this.

A second way to go about reducing fragility is if there are 10,000 capacitors you're going to need over 10 years, file 10,000 of them in the first lot because you know you're going to need them. Because if then supply is interrupted or there's another pandemic or whatever—you can't get those capacitors—the DOD or the industry itself has the supply base already in inventory to not stop production.

So there's a number of approaches like that but the whole concept is this anti-fragility—how do we make things stronger when they get disrupted versus weakened or failing?

Mr. DELUZIO. Thank you. I yield back, Mr. Chairman.

Mr. GALLAGHER. The pride of Long Island, Mr. LaLota.

Mr. LALOTA. Thank you, Mr. Chairman. I appreciate your leadership on this issue and for our witnesses for being here today.

To me, what makes our Nation's military the most lethal fighting force our world has ever known is twofold. One, we have the best, most dedicated professional troops the world has ever known, and two, we have the best technology available.

This enables the United States to deter conflict, hopefully, but to win it when we're engaged and to bring our troops home safely and this committee surely appreciates your work helping us achieve that mission.

Gentlemen, with that in mind, I represent New York's First Congressional District, the east end of Long Island, and we are home to Hauppauge, the Nation's second largest industrial park after Silicon Valley.

Hauppauge is home to many suppliers and contractors which provide our Nation's military with the resources they need to remain the most lethal in the world.

Mr. Taiclet, thank you for your service in the Air Force. I'm sorry you went to the Air Force Academy and not the Naval Academy.

Nevertheless, sir, you mentioned in your prior testimony that you want to work with all of industry to become more independent from China. I think that's a reasonable goal, and I've heard with respect to all of industry it is often said that large defense prime contractors are not as nimble and as innovative as the small startup companies.

But, yet, the small startup companies are not as capable of producing military systems at scale. Would you, sir, agree with that characterization?

Mr. TAICLET. My characterization would be there's a role for all types of companies and all segments of our society to contribute to national security and deterrence but there has to be a framework around it so that small companies, medium-sized companies, can be effective.

And so that's why we're really pushing the notion similar to the telecom industry let's have a standards body that as we did in—it's called the 3GPP [Third Generation Partnership Project] in telecom business—what are the APIs [application programming interface] we're all going to use?

What are the interface technologies we're going to use? What's the error correction code that we'll—everybody will share?

And we'll cross-license those to each other so that our investments whether small, medium, or a large company, are compen-

sated for and there's some return to our investors. This has been done in telecom already but it was not done right the first time.

There were three standards back in the early 2000s for mobile telecom and now there's one. And by going to that one single set of standards that was built by the industry with the customers' involvement we were able to accelerate through 3G, 4G, and 5G and get the—to get the network capability we have today in a 20-year span, which is what it takes to develop one defense system.

We went through three generations of mobile technology in that span of time. I think we should apply the same approach here and get a big tent and essentially marshal all of U.S. industry on a common platform architecture to contribute what they can.

Mr. LALOTA. So is it safe to say that rather than characterizing the big guys and the little guys as competitors that you see it more as a complementary environment to help satisfy this committee's and the Nation's goals?

Mr. TAICLET. Yes. Yes, that's correct, and we will compete in the right spaces in the right ways. But if we don't compete on a common architecture and there are three or four different approaches to command and control or AI or 5G we're not going to have an effective outcome.

And so there will be a role for competition—a strong role—but there's also a role for industry collaboration with government to figure out how to make the most progress the fastest.

Mr. LALOTA. I appreciate that. I want to switch gears with my remaining 90 seconds. We as a nation have been investing in hypersonic technology for quite some time but we haven't delivered the desperately needed operational capability to our warfighters yet.

The F–25 is a 12-plus-year development cycle before we deliver operational capability. Why does it take so long and so much money to develop these capabilities?

Mr. TAICLET. The physical Newtonian technologies that go into some of these systems and platforms now are so advanced that they do require significant testing.

When you look at hypersonic strike, for example, you're getting to speeds that generate 2,000 degrees of heat on the vehicle. So when we run a test, for example, under those conditions, we might find that the bonding inside the solid rocket motor that connects the propulsion to the fuel source is coming apart. We'll have to get a new chemistry together with our solid rocket motor provider to make sure that doesn't happen.

So these are sophisticated technologies. They take a lot of effort and a lot of experimentation to——

Mr. LALOTA. Thank you.

Just real quick, I want to ask you one more question while my time is about to expire.

What lessons, if any, can you learn from private industry—non-defense industry—on their ability to do something sometimes less expensively and in a shorter period of time, sir? And if you can answer that in 20 seconds so I'm not rude to my colleagues.

Mr. TAICLET. Well, there's a—there's a big issue I think that's very, very important and that is making improvements in what we would call missions—commercial companies would call business

outcomes or services—every 3 to 6 months instead of just every 10 to 12 years when the new vehicle comes out. That's a conversion we need to take and it's going to—it's going to require a lot more than 20 seconds to explain.

But we need to take a mission lens through an entire national defense enterprise in addition to the product and platform lens that we have today to really make this happen.

Mr. LALOTA. If we gave you better buy signals, specifically ones with a longer duration, would your ability to deliver things be able to accommodate things to be less expensive and on a better timeline?

Mr. TAICLET. Yes.

Mr. LALOTA. Thank you, sir. I yield.

Mr. GALLAGHER. Dr. McCormick.

Dr. MCCORMICK. Thank you, Mr. Chair, and thank you to the witnesses for being here today.

George Washington at one time said to be prepared for war is the most effectual way to preserve peace. Obviously, you guys are a big part of that and we appreciate that.

One of the things that concerned me was, of course, the chips that are ending up in Iranian drones, which you've already addressed somewhat. I think we have some work to do on that—on our side, too.

So I'll move on to the next question I had, which is the ebbs and flows of the military purchasing that create functional problems for you guys in production. Obviously, hiring and firing people is not an easy thing to do and we cause that through the ebb and flow of our purchasing.

In relationships to Ukraine you can see, obviously, they're consuming a large portion of munitions and we may have other consequential force commitments around the world as well. Not only that, but we also can't predict what might happen tomorrow.

Do you feel that we are preparing in a way that we can not only sustain our war efforts in support of what Ukraine is fighting against an invading third largest army in the world but also other support that we have to provide around the world as well as our own future needs? If something were to pop up do we have the ability to ramp up quickly?

And I throw it out to the entire group.

Mr. SCHIMPF. My belief on this is the challenge is, you know, often, to give some—shout out to Mr. Taiclet here—I think often the problem is blamed on the primes and their ability to produce these things. In reality, what I've seen is the supply chain below that is often the limiting factor.

Often the challenge is how do we ramp everyone down two, three layers down the stack to be able to scale and provide the capabilities that are needed and that's an area where I think targeted investment from the Congress, from the DOD, can take a much more proactive approach. And I think it's key to work with and demand on contracts an understanding and visibility into that supply chain and write in the ability to ramp production.

So I think there's a lot of very straightforward incentives that the DOD and Congress can put in place to ensure that that ability to scale is there. But as of today, I think the problem really does

lie in that, you know, kind of robustness of the supply chain and how fast can they scale to support.

Dr. MCCORMICK. Anything to add? Okay. I'll move on to the next topic that's equally important.

So you're talking about the flexibility of the model and the ability to supply the supply side of ramping up. Of course, that doesn't cover labor but I'll assume we all understand that's a problem no matter where we're at in the cycle.

Furthermore, we see how we have gone with tax credits and spreading out the taxes over years and being able to—I'm not sure why we chose to do this but basically we spread out your ability to have flexibility in your financial model.

How has that affected each one of you at your different levels as far as the way we give tax credits? Instead of doing it all at once we have to spread it out, which, of course, if you don't have a whole lot of flexible capital I could see how that would be a limiting factor to your flexibility, as you said, even on the supply side but also on the monetary side, which is a very real consequence of what we do on the Federal level.

If you could talk to that, please.

Mr. TAICLET. Certainly, Congressman.

So at our company I was on the board directors from 2018 and in 2020 I was asked to join the company as CEO. When I did that we increased our independent R&D [research and development] and our capital expenditures significantly to ramp up because we knew the need was there for us to invest more.

When the amortization of R&D expenses then hit we decided not to scale back, but we couldn't—at that point, being financially responsible, add significantly more to the R&D budget because of the tax ramifications of doing that to the company.

So we have held the line on increased research and development but I think it has limited our upside based on the requirement to take some of that cash that we were putting into R&D and could have increased potentially a little bit more into the tax line instead.

Mr. MCCORMICK. Okay. I always like to use small words. Amortization, you know, it's way more than Marines you typically—and but I want to summarize that for the lay people out there.

Basically, when you spread out this model of tax credits over a long period of time it does have financial consequences in your R&D, our development of leading-edge technologies, our ability to have a flexible model, and even our purchasing power for supply side economics as a military model, and I just wanted to point that out with my last few minutes that we need to remain flexible and give the companies the ability to help us help them.

Thank you.

Mr. GALLAGHER. Thank you. We'll move to a second round. I'll recognize myself and want to pick up a little bit on the discussion on Replicator with what Mr. Schimpf said.

Referencing mass, as I understand it, the theory behind Replicator is that the PRC's [People's Republic of China's] advantage is mass—more ships, more missiles, more people. They can just throw a lot of this at the problem.

I would add a human dimension. I think if you study sort of the history of warfare, at least last time we fought the communists in the Korean war, you'll understand that these regimes are less sensitive to casualties than we are in a democracy. It just tends to work that way.

So if you offered Xi Jinping a choice of you can have Taiwan but it'll cost you your whole Navy he might take that offer.

And so we are going to use, if I get the acronyms right, all-domain attritable autonomous systems—ADA2—to counter China's A2AD [anti-access/area denial]. So we're going to put aside the ridiculousness of the acronym there.

But I understand the concept, right. But we have existing systems that would help us overcome the mass problem, right? You make Long-Range Anti-Ship Missiles. It's my understanding you could make more of these Long-Range Anti-Ship Missiles [LRASMs].

Now, Mr. Schimpf might say, well, we need cooler autonomous systems that Anduril builds, but this is something we know how to build. You build it. What would you need to expand the production of LRASM and other key long-range precision fires?

Mr. TAICLET. There's a few beneficial actions the government could take. One is to really create a long-range production and procurement strategy over, you know, 5 to 10 years.

Mr. GALLAGHER. So a multiyear appropriation?

Mr. TAICLET. A multiyear approach. Congress may need to adjust the ways that it allocates funding to that kind of approach so that the suppliers, as Mr. Schimpf said earlier, will have the confidence to ramp up and invest in that higher production level.

So we will have confidence at our company that LRASM—Long-Range Anti-Ship Missile—demand will increase because we understand the threat and the mission. But our suppliers who tend to be in the 80/20 rule, 80 percent of their business tends to be commercial and 20 percent of it tends to be military or defense related.

They're going to react to both of those markets and if they see more certainty based on commercial airline business or other factors that have nothing to do with national defense they'll probably put more resources in their—in their company into that business.

However, the way to get surety for them and for us and our investors is to have a longer range commitment by government to a production schedule that lasts more than 1 year.

Mr. GALLAGHER. And I want Mr. Schimpf to comment but—and maybe in so doing clarify something for me.

Would you be drawing on the same energetics necessary to put in these long-range precision fires? I recognize you're both making different things but are you reliant on the same energetics subcomponents in so doing?

We'll start with Schimpf. Then I'll go back to you, Mr. Taiclet.

Mr. SCHIMPF. One point I'll make is actually I'm a huge fan of LRASM and we need more of them and I completely agree with that, and there's a lot of other challenges that I think Replicator can solve in that of how do you target these, how do you get them at range, and I absolutely believe we need to ramp the production of existing capabilities. The——

Mr. GALLAGHER. And, by the way, they need to be prepositioned in theater——

Mr. SCHIMPF. One hundred percent.

Mr. GALLAGHER [continuing]. Because you're not going to be able to surge them forward in the event of a conflict.

Mr. SCHIMPF. That's right.

The thing I will say on the supply side is in some cases, yes, we'll draw on similar constrained, you know, supply pieces. But I don't think that is inherently bad, right. The answer has to be we have to increase capacity, not to, you know, sort of hoard the existing capacity we do have.

Mr. GALLAGHER. Do you own your own energetics or are you relying on other companies? You guys just bought something in Indiana, right?

Mr. SCHIMPF. We have invested in this from a solid rocket motor production capacity, and I won't speak for Mr. Taiclet but I believe he tried to have the ability to support this in the defense space.

Mr. GALLAGHER. Mr. Taiclet, do you want to comment?

Mr. TAICLET. Sure. There's two aspects. One is the explosive ordnance in the front of the missile and the second is the—is the propulsion. They are different. We tend to rely on explosive materials from third parties including the government and the solid rocket motor and liquid rocket motor industry, which is, you know, again, mixed to commercial but mostly defense oriented, for the propulsion.

The propulsion industry is—for solid rocket motors, as you know, now is really down to two meaningful players, one of which is now owned by Northrop Grumman, the other which is being proposed to be acquired by L3Harris. They're both in the other businesses as well.

We are endeavoring, as Mr. Schimpf's company, to create another supplier. We're in late stage negotiations with a company that can actually pull this off, we believe, and so we'll be seeking the same diversity that you're hearing about from some of the other panelists here today.

Mr. GALLAGHER. If Mr. Khanna will indulge me, I'm going a little bit over. But are you—if you pull that off or with what you've already pulled off in Indiana are you allowed to use advanced energetics like CL–20 as opposed to HMX [high melting explosive] suite of energetics? Or how does—how does that work?

Mr. TAICLET. Well, we have got a full range of energetics available to us. As you note, Chairman, we built a Trident missile—the D3 missile—from the strategic end to the Javelin, the tactical end.

So we have got access to all the energetics that are available for our products. So——

Mr. SCHIMPF. Yeah, and I think there is a lot of opportunity to—you know, China has a substantial advantage in terms of range of many of their weapons, and looking and accelerating novel energetics is, I think, absolutely one of the most strategic things that the U.S. can do. That has been a challenge.

There's a lot of questions around, you know, certification, shelf life, all these things. But there's a way to accelerate that timeline, get these fielded, and get substantial range increases to existing

munitions by adoption of novel energetics. I think it is a huge opportunity for the Department.

Mr. GALLAGHER. Mr. Khanna.

Mr. KHANNA. Thank you, Mr. Chairman.

Mr. Taiclet, as you know, the Patriot missile defense system is one of the most effective and expensive that we are sending to Ukraine.

"Sixty Minutes" had a report saying that for 7 years Lockheed Martin was making 40 percent profits on that system. Was the "Sixty Minutes" report accurate?

Mr. TAICLET. I don't want to speak to their reporting, but there was a DCAA——

Mr. GALLAGHER. Is your microphone on?

Mr. TAICLET. I won't speak to the reporting and their sources but the Defense Contracting Audit Agency—DCAA—did an audit of that program during that period of time and they calculated that the margin earned by the company was 11 percent, which comported with what our financial analysis showed internally.

Mr. KHANNA. So you think that their reporting was inaccurate or—because they were implying that you and a number of other companies were making 40 percent profit.

Mr. TAICLET. So all I can offer is what we have been provided by the government in response, not to that report but actually an audit that was done years ago.

Mr. KHANNA. But you would say that your profits they were 10 to 12 percent, not 40 percent in that time?

Mr. TAICLET. That's the—that's the company's view and from what we understand the U.S. Government's official view.

Mr. KHANNA. Is there any case of weapon systems that you're making more than 15 percent profit?

Mr. TAICLET. I'd have to look back in detail for the record, Mr. Khanna.

Mr. KHANNA. Today.

Mr. TAICLET. But I'm not aware of any that—well——

Mr. KHANNA. Would you be willing to commit today that you wouldn't sell any weapon system to the United States at over a 15 percent profit margin?

Mr. TAICLET. Again, I think we'll have to research that for the record. I can't make a commitment based on the contracts we already have with the Department——

Mr. KHANNA. Could you make a commitment at 20 percent? I mean, where would you make the commitment?

Mr. TAICLET. We have to negotiate each of our programs with the U.S. Government and we would do that——

Mr. KHANNA. But, certainly, you'd say there's a reasonable level, right, I mean, which the profit shouldn't be over? Do we agree that—can we agree to 20 percent?

Mr. TAICLET. I just can't speculate on what that would that be here. I don't think we do 100 percent, no.

Mr. KHANNA. Twenty percent—I'm sorry. Twenty-five percent?

Mr. TAICLET. I think that perhaps we could meet offline on this. It's an answer I can't offer today.

Mr. KHANNA. I would like a commitment. I think it's a fair commitment after the "Sixty Minutes" report to the American people publicly that there is a reasonable profit, right.

We live in a capitalist system. People are fine 10 percent, 15 percent, probably even up to 20 percent. When you get beyond 20 percent I think people are saying why are we paying all that money to defense contractors, which should be going to our troops and to our defense.

Mr. TAICLET. All I can commit here, Congressman, is that we endeavor to and will continue to comply with the Federal Acquisition Regulation [FAR], which does limit the profitability of defense article sales.

Mr. KHANNA. But would you at a future point, if you don't want to make the commitment today, be willing to make a commitment to a 20 percent profit on systems?

Mr. TAICLET. I would—I'll only be able to say what I've offered, which is we'll maintain compliance with the Federal Acquisition Regulation because that's the governing structure for our business.

Mr. KHANNA. And will you be willing to provide the committee with a report of where you're making over a 15 percent profit today?

Mr. TAICLET. I'll—yes, I'll ask my finance team to pull together any data that would show operating margins above 15 percent. I can certainly give you the information and will for the record.

[The information referred to can be found in the Appendix on page 81.]

Mr. KHANNA. I appreciate that.

Mr. TAICLET. Yeah.

Mr. KHANNA. Thank you.

Mr. GALLAGHER. I wonder if the challenge would be for across-the-board commitment. There could be systems in which you lose money and others in which you make a lot of money and those—it's sort of the whole ecosystem.

But understanding that, you know, the limit we have put on through the FAR and how much money you're making would help us figure that out.

I would like to—Mr. Fallon is supposed to come back. I got one more thing at least I want to get through, which is in—Mr. Taiclet, in your testimony in the last section about collaborating more closely with trusted allies and partners I think is quite good, and maybe just talk us through some of the barriers you've encountered—and, actually, I guess I'd open this up to the whole panel—in terms of ITAR regulations—International Trafficking in Arms Regulation—particularly as it pertains to collaboration with our closest allies, the Aussies and the Brits.

Mr. TAICLET. So we have a significant, and rightly so, regime of technology transfer regulation. However, again, it could be—we feel it could be adjusted based on the actual allies' circumstances.

So, for example, the AUKUS [Australia, United Kingdom, United States] countries could have a different set of ITAR standards apply to them as a group. Individually, Canada already does. There are certain waivers to regulations with regards to Canada.

So there's some models already out there that we could essentially not treat all foreign countries the same. That's not exactly

how it happens today. But there could be more differentiation among countries to speed up technology release, and not just for research and development purposes but also for production and sustainment purposes.

In other words, if we're going to be in a contested logistics situation in the future, which is likely to happen if there is a conflict, it will be extremely difficult to ship, as you've said, Chairman, resupply, spare parts, repaired parts back and forth across the oceans.

And so, therefore, it's going to be more important to have production and repair and overhaul capability in the regions and theaters where the United States forces and our allies are going to be. So that's a part of this.

We would like to explore regulatory opportunities for relief and actually putting production and sustainment outside the United States with trusted partners, too.

Mr. GALLAGHER. All right. And Mr. Schimpf, I believe you have some innovative programs in Australia. I'm curious to have you comment on ITAR and——

Mr. SCHIMPF. The ITAR restrictions do definitely present some real—what we have seen with allies and partners is the ITAR restrictions basically force them into taking a much less collaborative stance with the U.S.

They essentially have to and we have built teams independently that operate in these other countries to build up similar technologies because they would be encumbered by a set of regulations that limit the ability of Australia to operate the way they need to operate.

I share Mr. Taiclet's view that, you know, looking at this from the lens of AUKUS, having a close collaborative relationship with them, in the same way we do in intelligence sharing.

We have already shared the most sensitive national security secrets with them. I believe we can do the same on defense articles very safely.

So limiting it to that view, I think, is a very effective way to massively increase the ability for defense technology to collaborate internationally, build up much more compelling capabilities, and really enable our allies to truly partner with us instead of viewing it as something that is separate and apart in many cases.

Mr. GALLAGHER. Mr. Jenkins, have you encountered this issue?

Mr. JENKINS. Yeah. I think for us ITAR is much wider in terms of deployment of unmanned systems. By definition you can't protect an unmanned system.

So we don't currently deploy any export control or ITAR hardware on our vehicles. But if you are going to deploy weapons or sophisticated targeting software or hardware on the vehicles we will need to find a way to be able to make that stuff attritable as well. So I think there needs to be some ITAR reform specifically relating to unmanned systems.

Mr. GALLAGHER. I appreciate that. I have one more. Fallon's not going to make it so I'm going to force Mr. Khanna to listen to me drone on here for 5 more minutes.

Well, I guess a dumb question or a diagnostic question, as it were. Okay. So if you were all king for a day—you are—you are

capable of commanding DOD to do one thing in this fictional universe to fix the problem—the valley of death problem, all the problems we have been talking about—what is that—what is that one thing?

Mr. Taiclet, we'll start with you.

Mr. TAICLET. I think it's very important to have a wholesale reorientation towards missions in addition to the orientation, again, of vehicles, products, and programs, if you will.

What we have done at our company is to try to path find this, Chairman, is we continue to have four large business units that build airplanes, AEGIS radar systems, PAC–3 missiles, et cetera.

But we have created institutional capability to map missions. So a mission would be air superiority. A mission would be——

Mr. GALLAGHER. Wait. Just so I understand, DOD would say, Lockheed, we are paying you to do X—give us air superiority here—as opposed to produce this system.

Mr. TAICLET. That's right.

Mr. GALLAGHER. In the simplest terms.

Mr. TAICLET. So the way to—the way to accomplish this, in our view, is to create this mission roadmap meaning what do the—what do the airplanes already have today? What are the radar systems I have? What are the satellite sensors that could be looped into a mission to shoot down enemy airplanes before they can shoot you down?

And being an ex-pilot myself I know what goes into this. It's sensing the enemy aircraft first. It's getting that tracking data refined from, say, a satellite level to an F–35 radar level.

It's then having the command and control system make a decision to target that airplane quickly and then have a missile that will go farther than the other—the enemy plane's missile can go and a radar that can see farther than the enemy plane's radar can see.

We can start accelerating digital technologies into that mission in a way that can move data flows faster so that we can make quicker decisions and be more effective and ultimately improve that mission without any new hardware and it would be tying a certain satellite that doesn't connect today to a command and control system in Hawaii to an F–35 in the South China Sea.

That could all be done with digital technology in a way that would be much faster than waiting for the next-generation air dominance airplane to show up in 10 years.

Mr. GALLAGHER. Mr. Schimpf, same question. You get the magic wand.

Mr. SCHIMPF. I think there's a huge number of systems that you can take a very straightforward kind of free market capitalist approach to, like, how you actually would make these work.

Basically looking at—you know, taking missile systems, for example, being able to have an opportunity to recompete and revisit these things periodically, have new entrants be able to invest and if they perform win.

When these systems are locked up for 10, 20, 30 years it is very hard for a new entrant to have any incentive to try to go after improving these technologies.

So I think the ability to, you know, rapidly recompete these award winners that are actually working and scale those into predictable production will substantially improve the competitiveness and speed that you will see innovation.

Mr. GALLAGHER. But what needs to happen inside the Pentagon or here in Congress for that to happen? Like, what——

Mr. SCHIMPF. I think we have to start on targeted, small activities where—you know, now I think we're starting to see more competitions and bake-offs where they're evaluating technology.

But the next stage of this, of actually fielding at scale, goes back to a lot of what I was saying before where, essentially, these things go into then more experimentation and more tests.

But actually getting these technologies to fielding very, very quickly is the most important thing and I think Congress can put language and tie appropriations to success of fielding, not just do you have a plan to field in 5 years.

Mr. GALLAGHER. Got it. Got it. I think I got it.

Mr. Jenkins.

Mr. JENKINS. Yeah. In the same vein, for me the gap which has to get fixed is the gap between proven experimental products to operations, right. There's no current trajectory at all to do that. Replicator maybe. DIU maybe.

But right now there's no funds apportioned to that. That is a considerable if not a terminal barrier for small business to get into large-scale replication.

We need to see budget allocated to that and an authority to distribute that in a clever way. My concern about replicating those things is that when you buy a lot of hardware very quickly, is it truly proven? Will it be out of date or expired within 12 months?

And I think you really have to—you know, we have done a million miles in the open ocean. We still learn new lessons every single day. Without doing that time in the ocean, if you'd asked to buy five new platforms 5 years ago we would have given you the wrong thing. It wasn't ready, wasn't mature. So as we run very fast I think we have to work out what technology is proven, is ready to scale, and then allocate budget to that.

Mr. GALLAGHER. Did you make a comment earlier about a combatant command approach? So what did you mean by that?

Mr. JENKINS. Yes. So, you know, right now it's a centralized process. Combatant commands have their own money. There's definitely a theory of giving spending power to combatant commands to buy their own hardware.

I'm on the fence. I could do it either way. I think if you give combatant commands control you might end up duplicating services—contracting services, fueling services—and the same technology is probably useful to multiple fleets and commands.

So Central Command is detached. You don't get good requirements through from the fleets right now. So I don't want to go into either camp. But either you give the combatant commands more money to make their own decisions or you centralize procurement in a central government body.

Mr. GALLAGHER. Great. Any other questions? Anybody? Going once. Going twice. Bueller? Bueller?

Thank you to our witnesses for your time. This was a not-boring hearing, which is our primary objective, to not be boring. I learned a lot and I think we have a lot of items that we can action in next year's NDAA.

Let's just hope we're not all sitting at a future Reagan National Defense Forum having the same trite conversations about valley of death this, valley of death that. The time is now to act.

So very much appreciate your time. I appreciate your leadership and look forward to working with you in the future. And with that, the subcommittee hearing is adjourned.

[Whereupon, at 10:28 a.m., the subcommittee was adjourned.]

A P P E N D I X

SEPTEMBER 20, 2023

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

SEPTEMBER 20, 2023

NOT FOR PUBLICATION UNTIL RELEASED
BY THE HOUSE ARMED SERVICES
SUBCOMMITTEE ON
CYBER, INFORMATION TECHNOLOGIES, AND INNOVATION

STATEMENT OF
JAMES D. TAICLET
CHAIRMAN, PRESIDENT, AND CEO
LOCKHEED MARTIN CORPORATION

BEFORE THE
HOUSE COMMITTEE ON ARMED SERVICES SUBCOMMITTEE ON CYBER, INFORMATION TECHNOLOGIES, AND INNOVATION
ON
INDUSTRY PERSPECTIVES ON DEFENSE INNOVATION AND DETERRENCE

SEPTEMBER 20, 2023

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Introduction

Chairman Gallagher, Ranking Member Khanna, distinguished Members of the subcommittee, thank you for the opportunity to testify today on Lockheed Martin's efforts to bolster deterrence and advance 21st Century Security for the United States and our allies. It is an honor to represent our 116,000 hardworking employees, who each day are striving to accelerate the best of commercial technology into our national defense enterprise. Such an effort is essential to ensure that the U.S. and its allies sustain a level of capability and effectiveness that will deter armed conflict and keep our country safe.

After graduating from the Air Force Academy, I began my career as a pilot, logging more than 5,000 flying hours in a Lockheed Martin C-141B Starlifter. I was impressed then at the plane's ability to fly tactical low-level, high-stress maneuvers in high speeds and low altitudes. I also had the privilege of transporting Army combat troops during the opening days of DESERT SHIELD. That formative experience is a constant reminder of Lockheed Martin's mission to provide the most advanced technologies, both physical and digital, for our Service Members on the front lines of defending freedom.

During my nearly 20 years in the telecom industry as CEO of American Tower, I led my company in driving transformative advancements in wireless technology from 2G through 5G in both the United States and 19 other countries in Europe, Asia, Latin America and Africa. In 2018, I returned to the defense industry as a board member of Lockheed Martin, armed with firsthand experience of tech and telecom capabilities that had the potential to have a huge impact on the defense industry as a whole. I could not have landed at a better place than Lockheed Martin because it is the premier engineering, technology, and innovation company across all domains – a true national asset with the resources to serve as the catalyst to bring the best of the aerospace and defense industry together with the commercial technology and telecom industry to serve the national interest.

Now, as CEO of Lockheed Martin, we are in the third year of reorienting our entire company to use our position as the largest aerospace and defense company in the world, and with a longstanding history of pioneering innovation and ingenuity, to be the pathfinder for what I call 21st Century Security. This initiative is about harnessing digital technologies like 5G, artificial intelligence (AI), distributed cloud computing, and software-defined networks into the national defense enterprise to deliver more advanced capabilities with greater speed, resiliency and interoperability for integrated deterrence…and to ensure the success of our forces if deterrence fails.

Broad adoption of 21st Century Security will bring a much needed step function improvement to the national defense enterprise's capability to deliver rapid mission capability improvements at this pivotal point in time. Civilian and military leaders agree that the United States is facing increasingly aggressive peer competition and threats, perennial budget constraints, and an acceleration of commercially driven technology, all of which call for new approaches to acquisition and military operations. Together – the Department of Defense (DOD), Congress, the defense industry, and the commercial technology sector – can push the boundaries of innovation, technology, and interoperability in ways our adversaries cannot match, with the ultimate goal of deterring great power conflict.

I strongly advocate three key priorities to help achieve this goal:

1. Applying the concept of anti-fragility to increase industry's ability to quickly ramp production of key systems in an ever-evolving global security landscape;
2. Aggressively accelerating the adoption and insertion of 21st century digital technologies through a standards-based, modular open architecture approach that allows the United States, international allies, defense primes, suppliers, and start-ups alike to work from the same framework allowing greater interoperability across all of our armed services; and
3. Increasing collaboration with allies and partners, including the establishment of key production and sustainment facilities in our most trusted allied nations globally, closer to potential theaters of operation of U.S. forces.

Applying 'Anti-Fragility' to the Defense Industrial Base

Supply chain, labor and inflation impacts stemming from the COVID-19 pandemic coinciding with Russia's invasion of Ukraine revealed fragility within the defense industrial base (DIB). Fragility refers to the brittle defense production system built for peacetime rates, not crisis or wartime rates. As industry and government leaders, it is incumbent on us to reverse these practices through consistent, stable investment levels, supply chain diversification, reduction in compliance burdens that prevent small and medium-sized businesses from participating in the DIB and expansion of tools like large lot buys of critical components and materials, and multi-year procurements.

Status quo investment levels and just in time deliveries have proved to be satisfactory only for peacetime production rates. Doubling or tripling capacity currently takes 2-3 years, which presents inherent security risks when sudden events, such as Russia's invasion of Ukraine, can cause drastic shifts in global demand for key systems. Consistent, anti-fragility investment in facilitation and surge capacity will enable more rapid production in the future and help maintain an effective deterrent. Upfront investment designed to ramp emergency or wartime production rates to two standard deviations above the mean of peacetime production rates will ensure the DIB can withstand shocks, stressors, volatility, foreign supply chains, and other outside factors.

A more diverse and trusted supply chain will also help solve for anti-fragility within the DIB. In the current system, too often a defense prime relies on a single company to supply a key material or component. If that single company fails or withdraws from the business or experiences a labor shock like what occurred during the COVID-19 pandemic, the entire supply chain can be up-ended. For key materials and components like semiconductors, solid rocket motors and rare earth elements, we need to create multiple reliable sources. Supply chain diversification can be enhanced by thoughtfully reducing oversight and compliance burdens on companies that participate in the DIB. Current compliance costs and procedures often serve as major disincentives to resource-constrained small and medium-sized businesses to participate in the DoD procurement system. Lockheed Martin, and a few other defense primes have begun to address this challenge by bringing start-ups into the DIB through entities like Lockheed Martin Ventures (described in detail below), but regulatory relief is needed to fully realize a robust, diverse and reliable supply chain.

We are pleased to see Congressional and DOD support for expanding the use of large lot/multi-year contracts, particularly for munitions, which have historically been procured through single-year contracts. Multi-year contracts improve industry's ability to effectively source long lead-time materials and finance the government's security needs through capital market investment. We

encourage even more widespread use of these contracting authorities to embed anti-fragility into the DIB and help keep the U.S. and our allies ahead of emerging threats.

Accelerating Innovation to Stay Ahead of Advancing Threats

For decades, China has been using the power of its authoritarian government to pursue civil-military fusion, the practice of intentionally using their commercial industry to augment and enhance their military and defense establishment. While we do not want to replicate that system of central planning and control in the United States, we must vigorously address it. As such, it is time to revisit accepted notions of the DIB – who is part of it, the capabilities it provides, and how it operates.

Expanding DIB Membership

The DIB of the future must not be limited to the traditional defense primes. We need to expand its 'membership' to include component suppliers and companies large and small specializing in semiconductors, strategic raw materials, cybersecurity, cloud computing, AI, advanced communications and more.

To jumpstart this effort, Lockheed Martin has been strategically partnering with some of the most prominent commercial technology companies, harnessing their solutions and expertise to advance the DIB. For example, last year we signed a landmark agreement with Microsoft Azure to enable distributed cloud computing and modeling and simulation capabilities in a classified cloud environment. We also have strategic partnerships in place with NVIDIA for AI and digital twin simulation; Verizon for 5G and advanced communications networking; and Intel and GlobalFoundries for semiconductor manufacturing.

These commercial partnerships have already resulted in innovative technologies to bolster U.S. security. In partnership with Verizon last year, we flew 5G-enabled drones to capture and securely move high-speed, real-time intelligence, surveillance and reconnaissance data from aircraft in flight to a livestream video feed where commanders could see the footage in real-time. In partnership with NVIDIA, we're building digital twins of wildfires that accurately display the 3D topography, vegetation, and current perimeter of a wildfire, while overlaying AI-enabled predictions of where the fire is likely to spread based on the environmental factors. This capability will eventually enable first responders to test courses of action in a digital environment before deploying resources. Similar technology we're developing with Microsoft can provide a digital testing alternative for military environments, which can drive down costs of exercises and help keep service members safe.

To bring start-ups into the DIB, we launched Lockheed Martin Ventures in 2007 and have been increasing our strategic investments in companies that are developing cutting edge technologies in core businesses and markets. Since I joined management as CEO, we have doubled our investments in these activities. More than a source of capital, Lockheed Martin Ventures helps these companies transition to suppliers and collaborators of our company, providing our start up partners with access to our world-class engineering talent, state-of-the-art technologies and research, as well as to the company's international business relationships and supply chain.

Similar to what we have done with LM Ventures and small companies, we also found a need to better partner with mid-sized companies that hold technologies and talent relevant to our

national security. To address that need, we formed LM Evolve to look at possible joint ventures or commercial alliances with mid-sized and large companies. This new group will provide us the framework and structure to invest in joint use commercial technologies and help bring them into the defense industry.

We must also leverage the defense industries of our allies to expand supply chain capacity and accelerate delivery of key systems. For example, we have partnerships in place with Rheinmetall Defence to collaborate on a unique rocket artillery system and to manufacture F-35A center fuselages in Germany. This summer, the United States and Australia announced an agreement to support a feasibility study to assess in-country co-production for Guided Multiple Launch Rocket System (GMLRS). Through agreements like this, we can optimize combined resources with our allies to increase deterrence around the globe.

The success of the DIB and its members starts and ends with people. By leveraging our employees' unique talents and experiences, we deliver innovation, affordable solutions and unparalleled customer value. For that reason, we invest heavily in advancing science, technology, engineering and mathematics education for our employees and potential talent, including high school students and postsecondary and adult learners. We have a wide range of internal programs like internships, apprenticeships, and university sponsored research, as well as external partnerships with Hiring our Heroes, DOD's SkillBridge Program, Project Lead the Way, CodePath, Million Girls Moonshot and more, contributing to a robust, skilled workforce for the DIB.

A robust DIB, made up of companies of varying specialties, sizes and national origins, will increase its strength, resiliency and overall effectiveness. Established DIB companies can help bring new entrants into this area. I am pleased to be a witness today with Richard Jenkins, CEO of SailDrone, with whom we are exploring opportunities to collaborate and jointly bring new capabilities to the industry. SailDrone has innovative unmanned ship designs that Lockheed Martin may be able to help fit the needs of our military. We have also partnered in the past with Anduril and continue to look for areas to collaborate. Together our employees and technology may provide more than each company alone can bring to the DOD and protect our nation's security.

Advancing DIB Capabilities

Since its inception, the DIB has followed a platform-centric model, providing familiar and critical assets including satellites, aircraft, ships, and air defense systems. With the 21st Century Security model, Lockheed Martin is leading the industry shift to a mission-centric approach that uses the latest digital technologies to network these platforms together to vastly improve their effectiveness and deterrent value. The DOD has recognized this imperative, and the department has made important progress on joint all-domain operations (JADO) and joint all-domain command and control (JADC2). However, only urgent and aggressive adoption of 21st century digital technologies into the DOD's trusted platforms will increase integrated deterrence as mandated by the National Defense Strategy.

Lockheed Martin is rapidly moving out on this 21st Century Security shift. At USINDOPACOM's recent Northern Edge exercise, we successfully demonstrated digital command and control (C2) to synchronize joint all-domain fires. This Joint Fires Network (JFN) demonstration integrated 21st century digital technologies with third-party platforms to provide a persistent and resilient common operational picture across the joint operating forces and all domains. With JFN,

geographically dispersed commanders can simultaneously share a common understanding of the threats that they are facing in real time, fed by sensors from multiple platforms in space, air, ground, and surface and sub-sea, which can provide coordinated targeting guidance to a wide range of weapon systems. And JFN can in the future also be propagated to our combatant commands around the world to provide these same.

Similarly, we are working with the Missile Defense Agency on the 'Defense of Guam,' a project that will significantly elevate Guam's integrated air and missile defense capabilities. The systems set to be integrated span defense primes to include Lockheed Martin's Aegis Combat System, Raytheon Technologies' Standard Missile 3 and Standard Missile 6, and Northrop Grumman's Integrated Air and Missile Defense Battle Command System, as well as Lockheed Martin's Terminal High Altitude Area Defense (THAAD) system already on Guam.

Our allies are seeking these capabilities as well. Just announced last month, we will be working with Australia to develop phase one of AIR6500, a Joint Air Battle Management System. This first-of-its-kind system will provide greater situational awareness and defense against increasingly advanced air and missile threats and enable greater interoperability with the United States and allies. These projects will serve as pathfinders for wide adoption of 21st Century Security and help shift the DIB's focus to digitally enabled mission-centric technologies.

It is important to note that we are pursuing 21st Century Security to enhance time-tested programs of record. The war in Ukraine is proof that systems like Javelin, GMLRS and High Mobility Artillery Rocket System (HIMARS) are invaluable assets in highly contested military environments. Lockheed Martin is committed to increasing production of our key systems for the United States and our allies and partners around the world. 21st Century Security is complementary to these efforts. For example, I recently met with a European customer that has fielded the F-35 and HIMARS. They are seeking to send sensor data from the F-35 to the HIMARS system to increase the accuracy of their targeting capability and better defend against incoming threats. This is exactly what 21st Century Security aims to accomplish. In the air domain, we are now enabling the F-35 to act as central node connecting the warfighter beyond ways we ever anticipated at the early stages of its development.

Streamlining DIB Operations

These pathfinder programs are already revealing lessons learned that we can apply to streamline operations and speed delivery of the aforementioned capabilities. Given the rapid acceleration of commercial technology, continuing to follow a single, standard procurement model for all DOD systems will inevitably prohibit the DOD's access to the latest, most advanced technologies. While, the multi-year procurement system has worked well for traditional defense and aerospace platforms, digital technologies are created and upgraded significantly faster. For example in the field of artificial intelligence, OpenAI has publicly released four separate, upgraded versions of chatGPT in a matter of just a few months. The DOD's current procurement model is not set up to keep pace with these types of rapid digital technology advancements. There are also challenges to contract and pay for commercial technologies, such as software and telecom infrastructure, that are typically sold via subscription services currently available on the commercial market. Deputy Defense Secretary Hicks' recently announced "Replicator" initiative may be a step in that direction.

To successfully incorporate the most advanced technology into the U.S. military, the U.S. Government should reform the process to establish a dual-track procurement system: one track for physical assets, and a separate track for digital acquisition. This will enable DOD and

Congress to continue its proven procurement system for ships, jets and other assets that require long development cycles, while harnessing commercial digital technology advancements at speeds commensurate with the much more rapid development cycles in the digital world.

Establishing a Standards-Based Approach

We need to take a proven approach to effectively and rapidly accelerate the adoption of 21st century digital technologies into the defense enterprise to realize the full potential of C/JADC2. A standards-based open architecture framework, with broad collaboration and input from industry, including startups, primes and commercial entities, and government, is critical to accelerate innovation, enable true interoperability and sustain technological dominance.

The telecom industry successfully implemented this approach to drive the advancement from 2G through 5G and continues to address new capabilities in cloud, software and NextG technology. All parts of the industry participate, including Communication Service Providers, suppliers, and systems integrators. According to the TM Forum, an alliance of more than 800 companies participating in the telecommunications industry, the open-architecture, standards-based approach has improved agility, removed barriers to entry and partnering, accelerated connectivity capabilities, and optimized the customer experience.

Lessons learned from commercial approaches can be applied to the defense industry to develop open technical standards and ensure appropriate long-term investments to maximize interoperability with and between legacy and new platforms and between military services, allies and partners. That is why we have and will continue to advocate for the creation of a C/JADC2 technology and standards advisory body, so that the defense enterprise, comprising DOD, defense and commercial companies, can move forward collaboratively and more rapidly toward realizing C/JCAD2 interoperability in the future. The Third Generation Partnership Program used by the wireless telecom industry could provide a model for a C/JADC2 technology advisory body that would enable industry to coalesce more rapidly around:

- Enterprise level technical standards and protocols;
- Artificial intelligence and machine learning technologies;
- Data requirements;
- Advanced communications elements such as waveforms and frequencies;
- Networking technologies, including interfaces and error correction;
- Enterprise and edge cloud technologies; and
- Interoperability frameworks and API's (application programming interfaces).

The purpose of such a body would be to review DOD needs and requirements, drive existing standards and interfaces that allow for maximum mission integration and seamless data flow, review new technologies and planned investment and deployment schedules. Subordinate technical working groups comprised of defense and commercial companies along with DoD experts could review and recommend new technologies for Office of the Secretary of Defense (OSD) consideration and approval to achieve cross-service and coalition interoperability.

We realize the difficulties in advancing this goal and believe giving industry more active technical, management and investment roles in C/JADC2, driven by DOD operational requirements, will allow them to propose and develop the technologies and architectural solutions that will significantly advance and speed C/JADC2 deployment. As defense industry

primes tend to provide capabilities to all services, their platform and mission expertise complemented by commercial (large and small) digital economy expertise is a tremendous force that could better deliver C/JADC2 integrated and interoperable solutions to DOD, allies and partners.

And we realize the urgency, especially with USINDOPACOM, for building out the C/JADC2 Integrated Data Layer/Mesh as we approach the 2027 timeframe. We are fully committed to supporting Office of the Secretary of Defense, the Joint Staff, and Services with their current approaches to C/JADC2 and recommend the standup of a C/JADC2 technology and standards advisory body to complement these lines of efforts by establishing processes for collaboration to more rapidly realize a future fully interconnected C/JADC2 operating environment.

Collaborating More Closely with our Trusted Allies and Partners

Foreign Military Sales (FMS) and technology relationships with allies and partners play a vital role in strengthening alliance-based deterrence in an increasingly complex global security environment. Lockheed Martin is committed to supporting U.S. international security cooperation objectives and supportive of ongoing efforts to improve and streamline processes for assessing and approving FMS, Direct Commercial Sales and technology release and export to allied nations.

Although the FMS process can be inefficient and complex, it is not "broken." The ongoing U.S. government FMS reform efforts provide a good opportunity to make progress and address specific barriers, deficiencies, and inefficiencies in the system rather than comprehensive reform and restructuring. Moreover, the Australia/United Kingdom/US (AUKUS) initiative offers a fortuitous opportunity to improve defense cooperation with our closest allies and strengthen our capacity and capability to deter global threats. Accordingly, we recommend focusing reform proposals in the following areas:

- Reducing the burden – both real and perceived – of U.S. export controls is an effective way to increase U.S. competitiveness.
- Eliminating transactional license requirements for our closest allies and for US cooperative defense programs, like the F-35, that have already been approved by the USG.
- Supporting legislation that gives clear guidance to the Departments of State, Defense, and Commerce to implement appropriate license exemptions – like what we already do for Canada – and other licensing mechanisms that would reduce the licensing burden under AUKUS.
- Ensuring that defense export policies are up-to-date and support working with our closest allies on next generation defense capabilities, such as hypersonic strike technology, necessary to deter and defeat regional threats.

The COVID-19 pandemic, Russia's war on Ukraine and China's increasing assertiveness have also underscored the importance of pursuing a multilateral, multinational approach to elevating the resilience of the West's critical defense supply chains, and a growing need to advance the development of resilient, and sometimes forward production, maintenance, and sustainment capacity. Streamlining approval processes to permit production of defense articles and systems outside of the U.S. that are reliant on U.S. developed technology can also help reduce the fragility and increase the capacity of the defense production system.

Conclusion

As the aerospace and defense industry leader, Lockheed Martin accepts the responsibility to be a pathfinder for DIB innovation and transformation; but this must be a larger team effort. The increasingly sophisticated threats we face provide a stark reminder of the urgent need for action. We believe the three lines of effort outlined today will set the defense industrial base on a path to maintain Western technological superiority well into the 21st century and beyond.

By applying anti-fragility measures to the DIB, we can increase industry's ability to quickly ramp production of key capabilities, regardless of system shocks and stressors. The aggressive adoption and insertion of 21st century digital technologies through a standards-based, open architecture approach will enable quicker development of advanced, network- and mission-centric solutions. Increasing collaboration with trusted allies and partners through a multilateral, multinational approach will elevate the resilience of the West's critical defense supply chains, ensuring an effective deterrent against near-peer competitors and rogue states alike. The challenges we face, such as resource constraints and procurement reform are not insurmountable, and our company looks forward to working with you on solutions.

Thank you again for the opportunity to testify on behalf of Lockheed Martin and thank you for your many years of support for our workforce and programs. The dedicated men and women in our company, of whom 20 percent are military veterans, are eager to partner with you and our customers to advance the DOD's vision for integrated deterrence. I welcome any questions you may have.

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James D. Taiclet
Chairman, President and Chief Executive Officer
Lockheed Martin

James ("Jim") D. Taiclet is chairman, president and chief executive officer of Lockheed Martin Corporation. He became chairman in March 2021 after joining the company as president and CEO in June 2020. Taiclet has been a director on the Lockheed Martin board since January 2018.

Prior to joining Lockheed Martin, Taiclet was chairman, president and chief executive officer of American Tower Corporation, one of the largest global real estate investment trusts (REITs) and a leading independent owner, operator and developer of multitenant communications real estate. Under his leadership, the company's market capitalization grew from approximately $2 billion to more than $100 billion. Taiclet guided the company's transformation from a primarily U.S. business to the only truly global player in its industry, with significant assets and operations in 19 countries around the world.

Before he led American Tower, Taiclet served as president of AlliedSignal (subsequently Honeywell Aerospace Services), a company that conducts worldwide aircraft engine and component overhaul and repair, parts sales and distribution, space operations, and technical services. Preceding his tenure at AlliedSignal, he served as vice president, Engine Services at Pratt & Whitney, where he was responsible for leading both military and commercial jet engine overhaul and repair.

Taiclet began his career as a U.S. Air Force officer and pilot, logging over 5,000 flying hours (most of which in a Lockheed C-141B StarLifter) as an aircraft commander, instructor pilot, and unit chief of Standardization and Evaluation. His rotational assignments included stints with the Joint Staff and Air Staff at the Pentagon. Taiclet served in the Gulf War during which, among other missions, he piloted one of the first transport aircraft to bring U.S. forces into Saudi Arabia for Operation Desert Shield.

As a distinguished graduate of the U.S. Air Force Academy, Taiclet earned bachelor's degrees in engineering and international relations. He also holds a master's degree from Princeton University, where he was awarded a fellowship at the Princeton School of Public and International Affairs.

He is a member of the Council on Foreign Relations, the National Space Council's Users Advisory Group, and the Business Council. In June 2022, the U.S. Secretary of Commerce appointed Taiclet private sector co-chair of the U.S.-India CEO Forum. He is an associate fellow of the American Institute of Aeronautics and Astronautics (AIAA). Taiclet serves on the board of directors of Catalyst and Mass General Brigham. He also serves on the board of trustees of Brigham and Women's Hospital.

DISCLOSURE FORM FOR WITNESSES
COMMITTEE ON ARMED SERVICES
U.S. HOUSE OF REPRESENTATIVES

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(5), of the Rules of the House of Representatives for the 118th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants), and contracts or grants (including subcontracts and subgrants), or payments originating with a foreign government, received during the past 36 months either by the witness or by an entity represented by the witness and related to the subject matter of the hearing. Rule 11, clause 2(g)(5) also requires nongovernmental witnesses to disclose whether they are a fiduciary (including, but not limited to, a director, officer, advisor, or resident agent) of any organization or entity that has an interest in the subject matter of the hearing. As a matter of committee policy, the House Committee on Armed Services further requires nongovernmental witnesses to disclose the amount and source of any contracts or grants (including subcontracts and subgrants), or payments originating with any organization or entity, whether public or private, that has a material interest in the subject matter of the hearing, received during the past 36 months either by the witness or by an entity represented by the witness. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number), will be made publicly available in electronic form 24 hours before the witness appears to the extent practicable, but not later than one day after the witness's appearance before the committee. Witnesses may list additional grants, contracts, or payments on additional sheets, if necessary. Please complete this form electronically.

Hearing Date: 09/20/2023

Hearing Subject:

Industry Perspectives on Defense Innovation and Deterrence

Witness name: Mr. James D. Taiclet

Position/Title: Chief Executive Officer

Capacity in which appearing: (check one)

○ Individual ◉ Representative

If appearing in a representative capacity, name of the organization or entity represented:

Lockheed Martin Corporation

Federal Contract or Grant Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) or grants (including subgrants) with the federal government, received during the past 36 months and related to the subject matter of the hearing, please provide the following information:

2023

Federal grant/ contract	Federal agency	Dollar value	Subject of contract or grant
Please see attached			

2022

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2021

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Please see attached			

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2023

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Please see attached			

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Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment
Please see attached			

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Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment
Please see attached			

2020

Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment
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Organization or entity	Brief description of the fiduciary relationship

Organization or Entity Contract, Grant or Payment Information: If you or the entity you represent before the Committee on Armed Services has contracts or grants (including subcontracts or subgrants) or payments originating from an organization or entity, whether public or private, that has a material interest in the subject matter of the hearing, received during the past 36 months, please provide the following information:

2023

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Please see attached			

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Contract/grant/ payment	Entity	Dollar value	Subject of contract, grant, or payment
Please see attached			

2021

Contract/grant/ payment	Entity	Dollar value	Subject of contract, grant, or payment
Please see attached			

2020

Contract/grant/ payment	Entity	Dollar value	Subject of contract, grant, or payment
Please see attached			

Breakout by Customer ($M)	2020	2021	2022	YTD June 2023
Total DoD	42,156	41,897	42,335	20,208
NASA	1,657	1,546	1,419	775
Intel	656	619	533	277
DHS	158	100	91	49
Civil/Other US Government	3,841	3,988	4,137	2,127
Total U.S. Government	**48,468**	**48,150**	**48,515**	**23,436**

International Sales by Region ($M)	2020	2021	2022	YTD June 2023
Europe	6,335	6,760	6,267	3,145
Middle East	3,940	4,253	3,796	1,659
Asia Pacific	5,176	6,108	5,479	2,712
Americas	758	1,013	983	448
Africa/Other	177	305	406	146
Total International	**16,386**	**18,439**	**16,931**	**8,110**

Note: International sales include FMS contracted through the U.S. Government, direct commercial sales with international governments and commercial and other sales to international customers.

"Industry Perspectives on Defense Innovation and Deterrence"
Hearing Before the Subcommittee on Cyber, Information Technologies & Innovation of the House Committee on Armed Services

Statement of Brian Schimpf
Co-Founder and Chief Executive Officer, Anduril Industries

September 20, 2023

Chairman Gallagher, Ranking Member Khanna, and distinguished Members of the subcommittee, thank you for the opportunity to testify today. I am honored to represent Anduril Industries and the members of our team.

Anduril was founded in 2017 to deliver software-defined technology solutions to the United States military and to allied and partner militaries. We appreciate your focus on defense innovation and the need to expand the defense industrial base to include new entrants. Thanks in large part to your leadership, the policies and authorities needed to deliver innovative technology solutions have improved significantly: no longer do we debate whether, why, or when innovation is needed. Instead, the issue now is ***how*** to do it. We argue that the key to success is incentivizing production of high quantities of the right capabilities, across all domains, at speed and scale.

Anduril is a new type of defense company, and we joined this mission to protect the security of the United States and our allies and partners. The U.S. defense enterprise is in a strategic predicament. Our ability to generate and project military power is overly reliant upon small numbers of exquisite systems that our industrial base cannot build at relevant scales and speeds. Anduril is building software-defined and hardware-enabled platforms across domains to field an arsenal of smaller, lower cost, autonomous systems that can be produced at scale within 18-24 months, fielded rapidly to U.S. forces, and transferred to our allies and partners.

Anduril's mission recalls the World War II-era drive for the United States to become the "arsenal of democracy." Importantly, however, the country cannot build that arsenal as we did in the 1940s, through massive new government organizations, unconstrained resource allocations, or centralized industrial policy. Nor can the country succeed through incremental changes to a legacy system that is not optimized to produce the types of technology needed for modern warfare. Instead, the United States – and specifically the Department of Defense – must use the market principles that have spurred generations of technological progress and economic prosperity. Those principles leverage the power of software, the talent of the American workforce, and the ingenuity of public servants to change the way we deliver and deploy defense technology.

At Anduril, we call this approach "Rebooting the Arsenal of Democracy."[1] Put another way, tinkering with the existing defense acquisition system will not succeed. Instead, the United States must "reboot" the system that initially created and sustained the arsenal of democracy.

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[1] Anduril Indus., *Rebooting the Arsenal of Democracy* (2022), https://www.rebootingthearsenal.com.

Anduril is a defense technology company that builds integrated software and hardware products. Software is at the core of the weapon systems of the future. Take unmanned aerial systems, for example. UAS have been staples of the arsenal for decades, but vehicles that are manually piloted and monitored require crews of a dozen to operate. Cutting-edge AI and autonomy can reverse that equation.

Our software platform, called Lattice, underpins all our products. Lattice is a situational awareness platform that ingests sensor data to give users a picture of everything happening in a defined area. Lattice works autonomously, taking data from Anduril assets and third-party systems, presenting users a real-time operating picture to make decisions about how they wish to respond to the information Lattice collects. Just like a phone can seamlessly communicate, share data with, and take tasks from a laptop, Lattice can integrate legacy systems with new technologies by sharing real time data and teaming capabilities across autonomy-enabled assets. Our hardware programs are integrated vectors to deliver cutting-edge software across multiple domains. Our approach contrasts fundamentally with older defense contracting models, which are hardware first, software second.

How should this approach inform defense policy?

Put simply, the government can innovate through act of buying at scale. We don't dispute the need for capacity and capability of ***some*** number of exquisite assets. However, the United States cannot succeed without augmenting those assets with new, mass-produced items far more responsive to market forces that the Department can affect. We will never see a true marketplace for aircraft carriers, but the Department can absolutely have one for sensors, satellite constellations, unmanned undersea vehicles, air defense systems, or precision strike munitions.

Those markets arise in response to real, meaningful, near-term production award opportunities. The subcommittee heard testimony earlier this year that the military needs "large quantities of smaller, lower cost, more autonomous, consumable things, and most importantly the digital means of integrating them."[2] Acquiring these types of capabilities ***now*** should be a priority, as they will enable the Department to delay and deter competitors who might otherwise be tempted to pursue an asymmetric attack on our high-end capabilities before we are able to mobilize the industrial base to respond.

Incentivizing competition is the core of this approach. By "competition," I mean genuine, sustained, and ruthless competition among serious bidders providing developed capabilities, not white paper submissions featuring familiar contestants and derivative wares. These competitions should be actual product-driven "bake-offs" and not paper-based evaluations, and they should end in a meaningful award.

Substantial production contracts provide an impetus for software-first companies to join this competitive landscape. Under Secretary LaPlante said it is all about production,

[2] *The Future of War: Is the Pentagon Prepared to Deter and Defeat America's Adversaries? Hearing Before the Subcomm. on Cyber, Info. Techs. & Innovation of the H. Comm. on Armed Servs.*, 118th Cong. (Feb. 9, 2023) (statement of Chris Brose, Author, *The Kill Chain*).

and we agree.[3] Fair and frequent competitions for large contracts force companies to earn the government's business, to maintain your trust, and to deliver high value at low cost.

There is no magic formula for driving down costs, but the more new and innovative companies we bring into the defense industrial base, the more these companies will compete, including on price. The more that companies spend developing capabilities on our own dime, instead of relying on inefficient cost-type contracts, the more cost efficient and effective our capabilities will be. And the more we leverage new technology, the more effectively we can employ our precious human capital.

With respect to software, we are talking about technology that exists today, that is deployed operationally today, and that in many instances is being fielded today by those who wish to do harm to America and its interests. This software is not easy to build and will require private sector experience and expertise. It cannot be built on the cheap and it will not be ready to meet our national security challenges if it is procured using traditional defense acquisition processes and timelines. Building world-class software is an engineering challenge equivalent to building a next-generation fighter jet, and we should treat it as such.

Congress has done yeoman's work to make this new framework a reality, and we are excited to see your committee and the Department build on those efforts. For example, it has never been easier for a new company to get research or prototype funding, thanks, in part, to the innovation ecosystem led by DIU and the Service "Werx." You have largely solved the "front door" challenge, so the policies I've described today focus on the next phase: how to scale capabilities from prototype to production.

The "APFIT" program[4] and the ongoing pilot for new funding approaches to software and digital technology,[5] both of which Congress established, are great steps, as is the proposal in this year's House-passed NDAA to initiate a series of rapid competitions.[6] These legislative provisions reflect the power of Congress to encourage innovative companies to work on defense technology by shifting to real, performance-based competition.

The tenets of this model will drive innovation:

- Structure competitions as a series of well delineated projects that test a vendor's ability to solve a pressing operational problem.

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[3] Hon. William LaPlante, Under Sec'y of Def. for Acquisition & Sustainment, Remarks to the Council on Foreign Relations: Is the U.S. Military Industrial Base Prepared? (May 3, 2023) ("[W]e've got to focus on production. Production, production, production."), https://www.cfr.org/event/us-military-industrial-base-prepared.

[4] National Defense Authorization Act for Fiscal Year 2022, Pub. L. No. 117-81, § 834 (2021).

[5] Consolidated Appropriations Act, 2021, Pub. L. No. 116-260, § 8131 (2020); *see also* National Defense Authorization Act for Fiscal Year 2020, Pub. L. No. 116-92, § 800 (2019).

[6] National Defense Authorization Act for Fiscal Year 2024, H.R. 2670, 118th Cong. § 851 (2023).

- Incentivize and empower decision-makers to manage these competitions and rapidly align resources to reward success.
- Always have a meaningful contract immediately following the competition's end and issue it quickly.
- Keep rewarding new bidders by frequently re-competing large programs.
- Measure outputs, not inputs: ask how many of those competitions led to meaningful solutions, and how quickly they delivered them.

Anduril's model works: recruit talented people; build quickly and efficiently based on calculated risk with scarce resources; and offer frequent improvement of software-first technology. With the right incentives, and with your continued leadership, the Department can reap the benefits of this model, U.S. and allied warfighters will be equipped for overmatch, and the United States can maintain the leadership position that has ensured prosperity and peace.

Thank you once again and I look forward to your questions.

Brian Schimpf
Co-Founder and Chief Executive Officer
Anduril Industries

Brian Schimpf is Co-Founder and Chief Executive Officer of Anduril Industries where he drives the strategic direction and product roadmap of the defense technology company.

Prior to Anduril, Brian was an early hire at Palantir Technologies, where he built the Foundry product that is now deployed worldwide, and led the engineering and product organizations as Director of Engineering. He served numerous domestic and international government organizations across the intelligence, defense, and law enforcement sectors.

Previously, Brian was the Founder and Lead of Cornell University's autonomous vehicle research program where his teams competed in the DARPA Grand Challenge and Urban Challenge. Based on this work, he published several technical papers on autonomous vehicles. Brian graduated from Cornell University with a Bachelor of Science in Operations Research and Industrial Engineering. He also serves as a senior advisor and board member for several government technology companies providing solutions to governments, and has previously served on federal advisory councils.

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Hearing Date: 09/20/2023

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Industry Perspectives on Defense Innovation and Deterrence

Witness name: Mr. Brian Schimpf

Position/Title: Chief Executive Officer

Capacity in which appearing: (check one)

○ Individual ● Representative

If appearing in a representative capacity, name of the organization or entity represented:

Anduril Industries, Inc.

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2023

Federal grant/ contract	Federal agency	Dollar value	Subject of contract or grant
H9240222D000	Special Operations Command	$967,599,957.00	CUAS
HQ0034219P001	Defense Innovation Unit	$99,905,000.00	CUAS
W519TC-23-9-2026	Chief Digital & Artificial Intelligence Office	$45,041,667.00	JADC2
FA4890-22-C-0005	Dept. of the Air Force	$50,000,000.00	UAVs

2022

Federal grant/ contract	Federal agency	Dollar value	Subject of contract or grant
H9240222D000	Special Operations Command	$967,599,957.00	CUAS
HQ0034219P001	Defense Innovation Unit	$99,905,000.00	CUAS
W52P1J-21-9-4100	Chief Digital & Artificial Intelligence Office	$13,400,000.00	JADC2
FA4890-22-C-0005	Dept. of the Air Force	$50,000,000.00	UAVs

2021

Federal grant/ contract	Federal agency	Dollar value	Subject of contract or grant

2020

Federal grant/ contract	Federal agency	Dollar value	Subject of contract or grant

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2023

Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment
ID11389	Australia	$50,000,000	Unmanned Underwater Vehicle
C22863	United Kingdom	$19,750,463.88	Maritime Security
701834450	United Kingdom	$5,005,400	CUAS

2022

Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment
ID11389	Australia	$50,000,000	Unmanned Underwater Vehicle
C22863	United Kingdom	$19,750,463.88	Maritime Security

2021

Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment

2020

Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment

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Organization or entity	Brief description of the fiduciary relationship
Anduril Industries, Inc.	Chief Executive Officer

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2021

Contract/grant/ payment	Entity	Dollar value	Subject of contract, grant, or payment

2020

Contract/grant/ payment	Entity	Dollar value	Subject of contract, grant, or payment

Statement of

Mr. Richard Jenkins,

Founder and Chief Executive Officer, Saildrone, Inc.

Before the

Subcommittee on Cyber, Innovative Technologies, and Information Systems

House Armed Services Committee

U.S. House of Representatives

Hearing on

"Industry Perspectives on Defense Innovation and Deterrence"

September 20, 2023

Introduction:

Thank you, Chairman Gallagher, Ranking Member Khanna, and Members of the Subcommittee, for providing me an opportunity to testify today and discuss how the U.S. commercial sector is building, developing, and operating transformative capabilities to collect maritime security data that can increase mission effectiveness of the military services.

I am the Founder and Chief Executive Officer of Saildrone, a U.S. company based in Alameda, California, with locations in St. Petersburg, Florida, and Washington, DC. Saildrone is the world leader in providing ocean data solutions with autonomous uncrewed surface vehicles, offering unrivaled payload, range, and reliability. Saildrone uncrewed surface vehicles (USVs) have sailed more than one million nautical miles and spent more than 30,000 days at sea collecting weather, climate, mapping, and maritime security data.

Saildrone USVs are: (1) primarily powered by wind and solar energy for propulsion and power; (2) scalable in size, ranging from 23 – 65 feet; and (3) purpose-built for different applications, including meteorological and oceanographic data collection, ocean mapping, and maritime domain awareness. Saildrone currently employs more than 230 people and has ongoing global operations supporting missions with NOAA, the U.S. Geological Survey, the U.S. Coast Guard, U.S. Customs and Border Protection, the National Geospatial-Intelligence Agency, the U.S. Navy, and the Defense Intelligence Agency.

Saildrone data collection is cost effective, and the data is of the highest quality, as verified by U.S. government customers. As the only small autonomous USVs capable of long-endurance MDA missions, the technology is extremely mature and recognized as Technology Readiness Level-9 by our federal customers. Saildrones are provided as-a-service

and do not need to be purchased. Instead the USVs are piloted and maintained by Saildrone while the USG customer has direct access and secure control over the data flow from the vehicle.

Saildrones utilize machine learning to deliver autonomous, real-time visual detection of targets, including those that are not otherwise transmitting their position. These detection events are then fused with other data —radar, automatic identification system (AIS), and acoustics—to deliver a fully informed picture of the surrounding maritime domain. This results in a persistent, rapidly scalable, low-cost solution to augment traditional manned maritime fleets – particularly for the U.S. Navy.

Commercial Innovation:

The commercial sector is developing and providing cost-efficient, alternative technologies to enable better observation of the ocean domain. Saildrone's uncrewed surface vehicle (USV) technology represents a paradigm shift in terms of the ease, efficiency, and cost of ocean monitoring. They can do many of the same jobs as traditional assets, with the same cutting-edge hardware and sensors, but at a fraction of the cost and carbon footprint.

Until recently, the ability of the government to test, adopt, and integrate new observing technologies was made difficult due to the initial large capital expense necessary to acquire and fully missionize the asset before it could really provide any value. In contrast, Saildrone USVs are provided as-a-service and do not need to be purchased unless desired. Our USVs are piloted and maintained by Saildrone, thereby shifting the burden of operation and risk to the private sector, while the U.S. government customer has direct access to and secure control over the data flow from the vehicle. By relying on the private sector to pay for the expensive infrastructure and shoulder the operational risk in certain circumstances, this type of public-private partnership

framework provides great opportunity and value to the government and agencies like the Department of Defense.

Operational Experience:

As previously stated, Saildrone serves customers across the federal government on civil and defense related missions. In the national security arena, Saildrone has operated continuously for the Navy's 5th Fleet in the CENTCOM area of responsibility (AOR) for nearly two years. Over this time, Saildrones have provided more than 30,000 hours of persistent maritime domain awareness where the availability of traditional manned ships is limited. While on station with Task Force 59, saildrones have detected and classified many thousands of surface vessels, allowing the Navy to greatly enhance its common operating picture while keeping sailors out of harm's way. Saildrone's automated tracking and reporting of vessels to command centers has proven that manned ships are no longer necessary for traditional watchstanding.

In addition to providing domain awareness, past missions with U.S. law enforcement partners have demonstrated that saildrones can be a strategic deterrent in places known for illicit trafficking. In areas where saildrones are conspicuously stationed, there have been considerable changes in behavior. Specifically, operators have witnessed dramatic shifts in traffic patterns away from Saildrone's mission areas. This disruption is costly to illicit actors and provides a significant strategic advantage for law enforcement.

With this in mind, the Navy has expanded its autonomous surface fleet to the SOUTHCOM AOR. Under 4th Fleet's command, 10 Voyager class saildrones will provide maritime domain awareness in the Caribbean to assist with drug trafficking interdictions. This is an area where the availability of manned Naval assets has been in high demand, yet low in

supply. Saildrone's long endurance autonomous fleets are now allowing the Navy to satisfy a longstanding requirement while preserving its manned ships for other priority missions.

Operational Integration Is Essential for Honing Capabilities:

The quickest way to innovate and expand our competitive edge is through operational fleet integration in permissive and semi-permissive environments. Missions in SOUTHCOM, NORTHCOM, and EUCOM provide fertile ground for testing, hardening, and integrating systems before deployments to hotly contested areas. Lower-intensity operations allow space to provide real-time upgrades to hardware and software based upon operator feedback, which is essential for ensuring integrity and interoperability when deployed in a wartime environment.

Whether on a counterdrug mission, guarding maritime perimeters, or countering illegal, unregulated, and unreported fishing (IUU), each vessel detection enhances Saildrone's machine learning-based capabilities. The ML architecture learns with each image, radar, and acoustic signature it collects, thereby constantly honing its ability to detect and classify surface vessels. Thus, more frequent and expansive operations in the immediate term will accelerate preparedness for higher intensity missions in the future.

This is true also for partner nations. It is in America's interest to equip other nations with autonomous USVs to expand the collective security footprint. As with our own national security apparatus, testing and integration with allied forces should begin now. The Defense Department should consider the authorities and funding associated with 10 U.S.C. §333 and 10 U.S.C. §284 to encourage and assist those nations where necessary.

Scaling to Meet Fleet-Wide Requirements:

The ability to rapidly scale small autonomous USVs is an extraordinary advantage not typically found with larger crewed assets. This is the unique benefit that commercial systems

provide, whether under a contractor-owned, contractor-operated or government-owned, contractor-operated model. The U.S. and its allies lack the number of assets necessary to monitor surface activity – both friendly and adversarial. The requirement cannot be addressed with manned ships alone – nor should it. It is too expensive and would take too much time to scale. Both time and money are in limited supply. Scaling small autonomous systems is the only reasonable path to acquiring an expansive operating picture of the surface environment.

If DoD wants to expand its competitive edge against our adversaries, and deploy systems within 18-24 months, it should begin by scaling proven technology that is productionized and tested, with proven utility. Industry is ready to respond, but the Department should provide sufficient lead time to ramp capacity and acquire materials. Deploying thousands of attritable autonomous systems inside two years requires contracts now. It is not possible to achieve this goal with infinite testing of new things and protracted contracting timelines.

It is likewise difficult to transfer technology, with proven utility, into ongoing operations without dedicated funding and corresponding program elements (PEs). Currently, there appears to be no specific budgetary allocations for autonomous surface MDA beyond those driven by congressional interest. In order to field these critical technologies over the next 18-24 months, the Department should immediately identify current funding to deploy mission ready systems for use by the combatant commands, and propose specific funding for such deployments in its fiscal year 2025 budget request. Budgeting for these systems cannot rely on the traditional Program Objective Memorandum process, which takes far too long, often multiple years, to unfold. In the meantime, Congress should strongly consider allocating additional funding in FY24 and encourage the Department to reprioritize amounts from other programs that are less successful.

Saildrone has productionized its systems and can scale to meet global fleet demands. It has a distributed manufacturing base in California, Alabama, Mississippi, and the State of Washington that is prepared to significantly increase production. Saildrone demonstrated its swift response for the Navy this year, when it assembled and shipped its fleet of 10 Voyagers for 4th Fleet within 5 weeks of being placed onto contract. Within 10 weeks, those saildrones will be on-station. This is likely the quickest the Navy has ever commissioned and operationalized a surface fleet.

While commercial entities like Saildrone are prepared to meet demand, it cannot happen overnight. They must acquire materials, expand production lines, and hire staff where necessary. Deploying hundreds or thousands of systems *next year* requires contracts *this year*. The Defense Department can and and should move quickly.

The Navy has demonstrated that it can integrate proven systems into its fleet architecture without the need to replicate TF59. 4th Fleet, for example, did not create a new autonomous capabilities office before deploying Saildrone's Voyager fleet. It leveraged existing contract processes at NAVSEA and the Defense Innovation Unit and assigned operational control to the Fleet. A system whereby the Navy centrally allocates proven autonomous systems to its fleets should be a model for future data acquisition. It would not only streamline the contracting process, but it would also create a single point of responsibility that Navy leadership can oversee and from which to demand swift results.

Conclusion:

It is now widely accepted that commercial technologies, such as USVs, and commercially-provided data will play an increasingly important role in helping the Navy meet its maritime domain awareness mission requirements. Change is never easy for a large institution,

but the Navy has been a great partner and has shown what can be accomplished with forward-thinking, senior-level engagement. A key to the success of this new paradigm will continue to be making contracting swift and agile in response to the rapidly changing technology climate without sacrificing good oversight of the use of taxpayer dollars.

We thank Congress, the Navy, the Defense Innovation Unit and the Unmanned Task Force for their incredible leadership and support for fielding unmanned autonomous systems. I appreciate the opportunity to testify today and express my views on this important matter on behalf of Saildrone.

SAILDRONE

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Richard Jenkins
Founder and CEO

CEO and Founder of SAILDRONE, Inc., Richard Jenkins developed SAILDRONE's core technology over a 10-year period, driven by the research he conducted to break the world speed record for wind-powered vehicles. He achieved that record in 2009, setting a speed of 126.2mph on the dry lakes of Nevada. Richard then applied the same, now patented, wing technology to unmanned sailing vehicles, which was the foundation upon which SAILDRONE Inc. was founded. The company now has 200 employees based in Alameda, California, with additional offices in Washington, District of Columbia, St. Petersburg, Florida, and Fall River, MA.

SAILDRONE designs, manufactures, and operates a global fleet of USVs with a track record of operational success over hundreds of thousands of miles for customers such as NOAA, the US Navy, the US Coast Guard and other research institutions around the world. Richard holds a Master of Engineering degree in Mechanical Engineering from Imperial College, London and is both an avid sailor and private pilot.

PROFESSIONAL EXPERIENCE

April 2012 - Present — **Founder/CEO, SAILDRONE, Inc.**
Unmanned Sailing Vehicles for ocean data collection

Mar 2011 - Mar 2014 — **President, Photon Composites**
Carbon composite structures for marine and aerospace applications

Oct 1999 - May 2009 — **CEO, Proteus Speed Ltd**
Owned & managed the Windjet Project, high speed wind powered vehicles, which turned into the Greenbird project with Sponsorship from Ecotricity.

EDUCATION

Sep 1996 - Jun 2000 — **Imperial College London**

SELECTED PUBLICATIONS

Meinig, C., E.F. Burger, N. Cohen, E.D. Cokelet, M.F. Cronin, J.N. Cross, S. de Halleux, R.Jenkins, A.T. Jessup, C.W. Mordy, N. Lawrence-Slavas, A.J. Sutton, D. Zhang, and C. Zhang. "*Public private partnerships to advance regional ocean observing capabilities: A*

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Saildrone and NOAA-PMEL case study and future considerations to expand to global scale observing," August 2019.
https://www.frontiersin.org/articles/10.3389/fmars.2019.00448/full.

Vazquez-Cuervo, J.; Gomez-Valdes, J.; Bouali, M.; Miranda, L.E.; Van der Stocken, T.; Tang, W.; Gentemann, C. "*Using Saildrones to Validate Satellite-Derived Sea Surface Salinity and Sea Surface Temperature along the California/Baja Coast.*" August 2018.
https://doi.org/10.3390/rs11171964

C. Meinig, N. Lawrence-Slavas, R. Jenkins and H. M. Tabisola, "*The use of Saildrones to examine spring conditions in the Bering Sea: Vehicle specification and mission performance,*" OCEANS 2015 - MTS/IEEE Washington, Washington, DC, 2015, pp. 1-6.

SELECTED PATENTS

Jenkins, Richard E., and Dylan Owens. Autonomous Unmanned Sailing Vessel. Saildrone Inc, assignee. Patent 9381985. 5 July 2016. Print.

SELECTED POSTERS

E. Cokelet, H. Tabisola, R. Jenkins, N. Lawrence-Slavas, C. Meinig, A. DeRobertis, I. Wangen, C. Kuhn, J. Crance, C. Mordy, P. Stabeno, J. Cross, "*Saildrone 2016: Simultaneously measuring the environment, fishes and marine mammals in the Bering Sea,*" Alaska Marine Science Symposium 2017 Poster.

Edward D. Cokelet, Christian Meinig, Richard Jenkins, Noah Lawrence-Slavas, Calvin W. Mordy, Heather M. Tabisola, Phyllis J. Stabeno and Jessica N. Cross, "*The First Saildrone Scientific Mission: The Bering Sea,*" Ocean Sciences Meeting 2016 Poster IS44A-2357, Abstract 93075.

DISCLOSURE FORM FOR WITNESSES
COMMITTEE ON ARMED SERVICES
U.S. HOUSE OF REPRESENTATIVES

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(5), of the Rules of the House of Representatives for the 118th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants), and contracts or grants (including subcontracts and subgrants), or payments originating with a foreign government, received during the past 36 months either by the witness or by an entity represented by the witness and related to the subject matter of the hearing. Rule 11, clause 2(g)(5) also requires nongovernmental witnesses to disclose whether they are a fiduciary (including, but not limited to, a director, officer, advisor, or resident agent) of any organization or entity that has an interest in the subject matter of the hearing. As a matter of committee policy, the House Committee on Armed Services further requires nongovernmental witnesses to disclose the amount and source of any contracts or grants (including subcontracts and subgrants), or payments originating with any organization or entity, whether public or private, that has a material interest in the subject matter of the hearing, received during the past 36 months either by the witness or by an entity represented by the witness. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number), will be made publicly available in electronic form 24 hours before the witness appears to the extent practicable, but not later than one day after the witness's appearance before the committee. Witnesses may list additional grants, contracts, or payments on additional sheets, if necessary. Please complete this form electronically.

Hearing Date: 09/20/2023

Hearing Subject:

Industry Perspectives on Defense Innovation and Deterrence

Witness name: Mr. Richard Jenkins

Position/Title: Founder and Chief Executive Officer

Capacity in which appearing: (check one)

● Individual ○ Representative

If appearing in a representative capacity, name of the organization or entity represented:

Federal Contract or Grant Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) or grants (including subgrants) with the federal government, received during the past 36 months and related to the subject matter of the hearing, please provide the following information:

2023

Federal grant/ contract	Federal agency	Dollar value	Subject of contract or grant
Contract	US Navy	5,562,00.00	Maritime Domain Awareness
Contract	US Navy	14,405,000.00	Maritime Domain Awareness
Contract	US Navy	28,140.00	Maritime Domain Awareness
Contract	US Navy	78,792.00	Maritime Domain Awareness
Contract	US Navy	191, 352.00	Maritime Domain Awareness

2022

Federal grant/ contract	Federal agency	Dollar value	Subject of contract or grant
Contract	US Navy	1,967,040.00	Maritime Domain Awareness
Contract	US Navy	1,553,328.00	Maritime Domain Awareness
Contract	US Navy	60,104.00	Maritime Domain Awareness
Contract	US Navy	4,332,399.48	Ocean Mapping

2021

Federal grant/ contract	Federal agency	Dollar value	Subject of contract or grant
Contract	US Navy	750,000.00	Maritime Domain Awareness

2020

Federal grant/ contract	Federal agency	Dollar value	Subject of contract or grant
Contract	US Navy	487,813.00	Maritime Domain Awareness Demonstration

Foreign Government Contract, Grant, or Payment Information: If you or the entity you represent before the Committee on Armed Services has contracts or grants (including subcontracts or subgrants), or payments originating from a foreign government, received during the past 36 months and related to the subject matter of the hearing, please provide the following information:

2023

Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment

2022

Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment

2021

Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment

2020

Foreign contract/ payment	Foreign government	Dollar value	Subject of contract, grant, or payment

Fiduciary Relationships: If you are a fiduciary of any organization or entity that has an interest in the subject matter of the hearing, please provide the following information:

Organization or entity	Brief description of the fiduciary relationship

Organization or Entity Contract, Grant or Payment Information: If you or the entity you represent before the Committee on Armed Services has contracts or grants (including subcontracts or subgrants) or payments originating from an organization or entity, whether public or private, that has a material interest in the subject matter of the hearing, received during the past 36 months, please provide the following information:

2023

Contract/grant/ payment	Entity	Dollar value	Subject of contract, grant, or payment

2022

Contract/grant/ payment	Entity	Dollar value	Subject of contract, grant, or payment

2021

Contract/grant/ payment	Entity	Dollar value	Subject of contract, grant, or payment

2020

Contract/grant/ payment	Entity	Dollar value	Subject of contract, grant, or payment

WITNESS RESPONSES TO QUESTIONS ASKED DURING THE HEARING

SEPTEMBER 20, 2023

RESPONSES TO QUESTIONS SUBMITTED BY MR. KHANNA

Mr. TAICLET. Lockheed Martin does not currently directly source any defense articles for US defense systems from China. Numerous statutes and regulations restrict the sourcing of various items from China. The restrictions implemented as a Defense Federal Acquisition Regulation (FAR) Supplement clause are included in our contracts with the Department of Defense (DOD). In turn, we include them as a term and condition of contracts with our suppliers and vendors. LM is committed to complying with all U.S. export control laws and regulations.

There are instances when a supplier discloses to LM that a part or item was inappropriately purchased from a Chinese source. In these instances, LM works closely with the supplier to find an alternative source. This year, Raytheon Technologies disclosed that it had improperly purchased low technology China-origin defense items, specifically printed wiring boards, brackets, cable assemblies, used in components for military aircraft. These parts do not represent a safety of flight risk or present a cyber risk. The matter has been reported to DOD and the Defense Committees, and a waiver for use has been granted. [See page 11.]

Mr. TAICLET. Lockheed Martin is a publicly traded company that operates in accordance with all Federal laws and regulations. As a provider of advanced technology to the U.S. federal government, including the DOD, we are subject to strict compliance and audit requirements to be eligible to bid and perform Federal contracts. In addition to public disclosure of our financial performance to the Securities and Exchange Commission, the DOD imposes a statutory framework where it achieves detailed insight to cost at the contract level. In addition, under FAR Part 15 where proposals are subject to certification under the Truth in Negotiation Act (TINA), detailed cost and pricing data is provided to and reviewed by the appropriate agencies as part of the negotiation and review process. Overall profitability for those proposals is also subject to profit weighted guidelines, which focus on performance risk, contract type risk, facilities capital employed, and cost efficiency.

In the past three years, LM has not negotiated any domestic contracts with the U.S. Government with a profit over 20%. For competitive reasons, we do not publicly disclose profit on a program-by-program basis.

As I agreed to provide at the hearing, below is additional information on our operating margins.

We operate in four business segments: Aeronautics, Missiles and Fire Control (MFC), Rotary and Mission Systems (RMS) and Space. We organize our business segments based on the nature of products and services offered.

Sales and segment operating margin are calculated and reported at the business area level. While our principal customers are agencies of the U.S. Government, our business area sales, profit, and margin figures include contracts and programs that serve U.S. and international customers with products and services that have defense, civil and commercial applications.

As disclosed publicly, LM's segment operating margin is below 15% in aggregate. Our operating margin is in family with industry averages for U.S. Government contractors. There is also no business area with a consolidated operating margin that exceeds 15% in the actual results depicted below. In 2021, LM's operating margin was 11.4% and in 2022 it was 11.3%. The third table identifies our year-to-date 2023 operating margin. [See tables next page.] [See page 27.]

$ Millions (excl. %)	Full Year 2021		
	Sales	**Profit**	**Margin**
Aero	26,748	2,800	10.5%
MFC	11,693	1,650	14.1%
RMS	16,789	2,030	12.1%
Space	11,814	1,184	10.0%
Total	**67,044**	**7,664**	**11.4%**

$ Millions (excl. %)	Full Year 2022		
	Sales	**Profit**	**Margin**
Aero	26,987	2,867	10.6%
MFC	11,317	1,637	14.5%
RMS	16,148	1,906	11.8%
Space	11,532	1,057	9.2%
Total	**65,984**	**7,467**	**11.3%**

$ Millions (excl. %)	Nine Months Ended September 24, 2023 (YTD)		
	Sales	**Profit**	**Margin**
Aero	19,861	2,064	10.4%
MFC	8,082	1,146	14.2%
RMS	11,528	1,286	11.2%
Space	9,226	851	9.2%
Total	**48,697**	**5,347**	**11.0%**