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BY THE HOUSE ARMED SERVICES
SUBCOMMITTEE ON
CYBER, INFORMATION TECHNOLOGIES, AND INNOVATION

STATEMENT OF
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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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