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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2024
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED EIGHTEENTH CONGRESS
FIRST SESSION

SUBCOMMITTEE ON STRATEGIC FORCES HEARING
ON
**FISCAL YEAR 2024 NATIONAL SECURITY
SPACE PROGRAMS**

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**FISCAL YEAR 2024 NATIONAL SECURITY
SPACE PROGRAMS**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Wednesday, April 26, 2023.

The subcommittee met, pursuant to call, at 2:21 p.m., in room 2212, Rayburn House Office Building, Hon. Doug Lamborn (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. DOUG LAMBORN, A REPRESENTATIVE FROM COLORADO, CHAIRMAN, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. LAMBORN. Today's hearing will come to order.

I ask unanimous consent that the Chair be authorized to declare a recess at any time. Without objection, so ordered.

I would like to welcome the witnesses to today's hearing.

We have Dr. John Plumb, the Assistant Secretary of Defense for Space Policy, back before the subcommittee.

John, I think you win the award for the most appearances this year. So, you should get a T-shirt for that. I testified at all these hearings and all I got was this lousy T-shirt, or something like that.

[Laughter.]

Mr. LAMBORN. Next, we have Mr. Frank Calvelli, the Assistant Secretary of the Air Force for Space Acquisitions and Integration, in his first appearance before this subcommittee.

We also have Dr. Christopher Scolese, the Director of the National Reconnaissance Office; and also, Ms. Tonya Wilkerson, the Deputy Director of the National Geospatial-Intelligence Agency.

Welcome back to all of you. Thank you for joining us. Thank you for your service to our Nation.

So, we are here to discuss one of the favorite topics of this subcommittee, national security space.

I was encouraged to hear General Saltzman say just last week at Space Symposium in my home district of Colorado Springs that, quote, "The old ways of doing business are too slow, too late to need, and too behind the times to meet the challenges we are facing today." Unquote. And I could not agree more.

Those of us on this subcommittee know better than most that space is vital to how we fight and win wars. Both China and Russia have seen the advantage we have built in space over the last few decades to enable the joint force. In response, they are now developing and deploying asymmetric counterspace systems meant to neutralize our advantage.

China also sees the benefits of space for its own deployment of forces. It continues to develop and field its own systems to support its long-range fire and standoff capabilities.

These threats are well-known by this point. Discussions about the democratization of space by space-faring nations have become more commonplace in the last 5 years. The result is more systems and more people operating in a domain that was only accessible by superpowers until very recently.

Today, I would like to hear what you all are doing to address the problem that General Saltzman identified. All of us on the subcommittee are interested in how you are changing the way you do business—going faster and becoming more innovative.

The commercial space sector is setting the pace on putting inventive technologies on orbit. I would like to hear from all of you how you are leveraging these developments in government programs, how you evaluate what is useful to buy versus build, and how you are coordinating with each other to maximize your efforts. Specifically, I am interested in hearing how space acquisition organizations are working with small business partners—small businesses as partners in these efforts.

Dr. Plumb, one area that you and I have talked about often is how the overclassification of space contributes to inefficiencies and slower processes. Two years ago, we asked your office to report back after looking at highly classified space programs to see what, if anything, could be reclassified. We are still waiting for that report.

Meanwhile, classification of space is a pervasive problem. I believe it is impeding the Department's progress on space; specifically, making it more challenging to collaborate with our allies and partners.

I am also interested to get your thoughts on the current state of space policy within the Department of Defense. There has not been an unclassified national security space policy document released since 2020, despite a requirement from Congress to produce one. I think you will agree that a lot has changed in those 3 years and public discourse is essential to getting our space policy right.

Mr. Calvelli, we recently received a report from you that identified the five highest and lowest performing major acquisition programs in the Space Force. Unfortunately, it doesn't look like much has changed in this report. The lowest performing programs are all ground systems led by the perennial underperformer, the Operational Control System, or OCX.

It has been said [so] many times at this point that it is now a cliché, but ground systems always seem to be the afterthought when it comes to space acquisitions. Ground systems are the nuts and bolts, the bread and butter, that make our exquisite satellite capabilities function. We cannot have one without the other.

Today I would like to hear your specific plan to get programs like OCX back on track and into the hands of the force. I would also like to hear about the policies you have implemented to make sure that we won't continue to see these problems on future ground acquisitions.

And I'm also interested in hearing from the whole panel how the Department of Defense and the intelligence community are collabo-

rating on systems and operations to support the joint force. As we come to terms with what it means for space to be a warfighting domain, we are going to continue to bump up against the line between defense and intelligence authorities. We must make sure that good collaboration continues, while also allowing the Space Force to mature into its role as a service.

There are many topics for us to cover today. I have gone past my time. So, I will leave it there and turn it over to my ranking member for any remarks that he would like to make.

STATEMENT OF HON. SETH MOULTON, A REPRESENTATIVE FROM MASSACHUSETTS, RANKING MEMBER, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. MOULTON. Thank you, Mr. Chairman.

And I would like to associate myself with your remarks, both about the topic at hand and about Mr. Plumb. Most of us around here believe in that constitutional stipulation that you are supposed to be elected to spend so much time in the House of Representatives, but we are grateful for your presence and your service.

I will try to move quickly through my remarks because they are going to sound very similar to the chairman's.

But thank you all very much, this entire panel of witnesses, for being here.

Across the jurisdiction of the subcommittee, our national security space architecture is one that, in my opinion, has experienced the most significant transformation over the past several years. And this transformation has been necessary to respond to the rapid pace at which our adversaries are developing, deploying, and demonstrating capabilities in space and on Earth to deny, degrade, and destroy U.S. satellites.

In the just the past 2 years, the People's Republic of China [PRC] has almost doubled their number of satellites on orbit to 400, with plans for nearly a thousand by 2030. And they include capabilities with inherently offensive applications.

Both the PRC and Russia are increasingly brazen in displaying their space warfighting capabilities, whether it be the PRC "grappler," which demonstrated the ability to drag a satellite out of its orbit; last year's incredibly destructive and debris-producing Russian anti-satellite test; or the multiple occasions where DOD [Department of Defense] and commercial satellites have been jammed during the war in Ukraine.

Broadly, the PRC is putting in place the capability and capacity in space, and on the ground, to hold U.S. assets at risk. Given what we know about PRC ambitions with regards to Taiwan, many experts believe that their first move in a conflict would happen in space.

In response to this growing threat, I'm encouraged that this administration has taken seriously the need to move away from the status quo and transition to a more robust and resilient U.S. national security space architecture. This means shifting from several exquisite "big juicy targets" in geosynchronous Earth orbit, or GEO, to many smaller, more commercially available satellites in low Earth orbit, or LEO.

For the NRO [National Reconnaissance Office] over the next decade, this budget request continues efforts to more than quadruple the number of satellites currently on orbit. This is a sharp departure from the attitude of the Department just a few years ago. Despite repeated warnings, the Space Force was modernizing the existing space-based missile-warning constellation by simply replacing the large, exquisite, unprotected satellites in the GEO orbit. Over the course of 3 years, the development price tag for next-gen OPIR [Overhead Persistent Infrared] ballooned to \$14.4 billion with significant delays.

But, in 2021, Space Force pivoted to a proliferated missile-warning architecture. The U.S. Space Force and the Space Development Agency, less than 3 years after contract award, just launched its first set of demonstration satellites to prove out the proliferated warfighting architecture in LEO, which will also provide data transport and missile track capabilities. DOD will be able to expand and improve capability every 2 years, as soon as this technology is available, rather than waiting for the standard 10-year acquisition cycle that has plagued the space community in the past.

In addition to these encouraging steps forward on acquisition, the space community is making strides on the adoption of commercial data and services. From expanding commercial imagery required to meet National Geospatial-Intelligence Agency requirements for the combatant commanders, or the great strides Space Systems Command has made to purchase commercial satellite communications and space domain awareness data, this adoption of commercial space has allowed DOD to focus on inherently military needs and stay ahead of our adversaries in the domain.

We have also made significant progress in the past several years with our incredible network of allies and partners. In addition to the work being done to share space domain awareness and adversary space capabilities, the DOD Space Policy guidance released last August explicitly directs that our space cooperation with allies and partners include policy, strategy, capabilities, information sharing, and operations.

The administration's announcement that it would not conduct destructive, debris-producing, direct-ascent anti-satellite testing has opened the door to 12 other nations committing to do the same. The U.S. must continue to lead by example in establishing norms of behavior for the responsible use and operations within the space domain.

Now, I'm increasingly encouraged by the direction of our space program as a whole, but there are some areas we will continue to watch closely. In addition to the pattern of large satellite programs being late and over budget, the ground system architecture still frequently comes as an afterthought. And the chairman mentioned this already.

Another area we will continue our oversight is in the overclassification of space, another thing the chairman mentioned, which inhibits both our ability to advocate for increasing investment and expanding collaborations with our allies and partners.

Space is a fascinating and infinite domain. Until recently, we really only experienced it through the lens of science fiction. But in reality, space has been a part of our daily lives as Americans

since the dawn of the space race, and our adversaries are keenly aware of that.

Our warfighters everywhere—on the ground, under the sea, and in the air—depend on space. But so do people all around the world—from Americans driving to work or checking the weather to Ukrainians valiantly fighting the unprovoked invasion by the Russians.

The global dependence on space often means relying on American satellites. We must keep them secure—not only against the threat we see today, but what we will face in the years and decades to come.

I look forward to today’s discussion with our witnesses on how to best maintain U.S. superiority in space, and how this year’s President’s budget request does that.

Thank you.

Mr. LAMBORN. All right. Our first witness will be the Honorable Dr. John Plumb, Assistant Secretary of Defense for Space Policy with the Department of Defense.

The floor is yours.

STATEMENT OF HON. JOHN F. PLUMB, ASSISTANT SECRETARY OF DEFENSE FOR SPACE POLICY, U.S. DEPARTMENT OF DEFENSE

Dr. PLUMB. Thank you, Chairman Lamborn; thank you, Ranking Member Moulton, members of the committee.

Thanks for inviting me to testify today on the Department’s national security space programs. I’m honored to appear with my colleagues, Assistant Secretary Calvelli, Director Chris Scolese, and Deputy Director Tonya Wilkerson.

Space plays a critical role in our Nation’s security, in our prosperity, in our way of life. For the Department of Defense, space is essential to how we compete and fight in every domain. It provides us with the missile warning and missile tracking critical to defending our homeland. It provides position, navigation, and timing to strike targets with precision, and it provides communication in austere environments to support global command and control. To put it simply, space-based missions are essential to the U.S. way of war.

But our competitors understand this. They are fielding and developing increasingly complex capabilities to deny space missions to the U.S. joint force. In just the last few years, the quantity and quality of counterspace threats has increased significantly.

China has already fielded ground-based counterspace weapons, including direct-ascent ASAT [anti-satellite weapons] missiles, and it continues to seek new methods to hold our satellites at risk. China is building a space architecture that enables its military to execute long-range precision strikes. China, ultimately, seeks to challenge our ability to conduct joint operations in the Indo-Pacific.

Russia is developing, testing, and fielding its own counterspace systems, including ground-based and space-based kinetic anti-satellite weapons. These are aimed at degrading and denying U.S. space-based services.

President Biden’s \$33.3 billion space budget for fiscal year 2024 invests in the capabilities necessary to meet these challenges. This

investment reflects an increase of roughly 15 percent from fiscal year 2023.

The President's budget request will accelerate our transition to resilient-by-design architectures. It will enhance our ability to fight through disruption. It will invest heavily in research, development, testing, and experimentation. And it will further integrate space-based services across the joint force.

The budget request includes nearly \$5 billion for missile warning and missile track, including \$2.3 billion for new proliferated resilient architectures and \$2.6 billion for Next Generation Overhead Persistent Infrared.

It has \$1.3 billion for position, navigation, and timing, including development of the Next Generation Operational Control System for GPS [Global Positioning System]. There is \$3 billion for 15 launch vehicles and range upgrades, and there is \$4.7 billion for protected and jam-resistant satellite communications, and this includes the Space Development Agency's space data transport layer. And the budget request also includes additional investments in ground user equipment, science and technology research, and classified programs.

Now, my office remains laser-focused on three priorities: space control, space cooperation, and space classification.

On space control, the Department will protect and defend our national security interests from the growing scope and scale of space and counterspace threats. And we will, of course, protect and defend our service men and women in harm's way from space-enabled threats.

For space cooperation, we are investing in relationships with allies, with partners, and with commercial space. These partnerships are an enduring strength and an asymmetric advantage our competitors can never hope to match.

And for space classification, the Department is working at the highest levels to remove barriers to sharing information with our allies and to strengthen and streamline our ability to communicate across the U.S. Government. And I will just note both the chairman's and the ranking member's strong interest in their opening statements in this issue as well.

Our competitors have watched us, they have learned from us, they have stolen from us, and they have developed capabilities to hold us at risk. But they are not ready for us. They are not ready for us today, and with congressional support for the national security space investments in the President's fiscal year 2024 budget request, they will not be ready for us tomorrow.

So, thank you to the committee for your tireless dedication to the Department and U.S. national security, and I look forward to answering your questions.

[The prepared statement of Dr. Plumb can be found in the Appendix on page 25.]

Mr. LAMBORN. Thank you.

We will, next, hear from the Honorable Frank Calvelli, Assistant Secretary of the Air Force for Space Acquisitions and Integration.

The floor is yours.

STATEMENT OF HON. FRANK CALVELLI, ASSISTANT SECRETARY OF THE AIR FORCE FOR SPACE ACQUISITIONS AND INTEGRATION, U.S. AIR FORCE

Mr. CALVELLI. Thank you. Good afternoon, everyone.

We continue to face an unprecedented strategic competitor in China, and our space environment continues to become more congested and contested. To address these challenges, we are fundamentally transforming our space architecture to be more resilient, proliferated, and integrated to meet warfighter requirements and to counter the growing threats.

Today, I would like to discuss the architecture changes that we are making, capabilities that we are delivering, and how we are overseeing and managing the space acquisition enterprise.

We are moving away from those big, juicy targets—highly capable systems, but very vulnerable in small numbers—to smaller proliferated resilient systems across multiple mission areas. For example, we are pivoting from the legacy missile warnings architecture to a proliferated resilient architecture that adds capability to actually track missile threats.

We are adding new capabilities to our space domain awareness architecture to focus on deterring and defending against attempts to negate our critical space capabilities.

We are fundamentally transforming our military satellite communications and data transport architecture through disaggregation, proliferation, capacity expansion, partnership with allies and with commercial, which will enhance our ability to fight in contested and degraded operational environments.

We are also collaborating with the intelligence community to design, develop, deploy, and operate a proliferated space-based ground moving target indication system.

Overall, these architecture changes help transform our space architecture to be more resilient, integrated, and provide new capabilities for our warfighters.

Over the past 15 months, we continued to deliver new critical capabilities. The Space Systems Command delivered last year into operations two new Geosynchronous Space Situational Awareness Program satellites, a new Space Based Infrared missile warning satellite which completes the SBIRS [Space Based Infrared System] architecture, and a new GPS III satellite which achieved operational acceptance in just 12 days after launch.

The Space Rapid Capabilities Office delivered their first set of missions to orbit, including two prototype enhanced situational awareness sensors and one new cryptographic payload.

And the Space Development Agency delivered their first 10 satellites to orbit last month, which included 2 tracking and 8 data transport satellites. This was accomplished in less than 3 years from contract award to launch.

And the Department launched nine national security space launch missions, providing critical capability across the Nation.

On launch, the next National Security Space Launch phase III procurement starts in FY 2025; pursues a dual-lane, hybrid contracting approach to maximize competition, and use of the Nation's robust commercial launch industry, as we transition to more proliferated architectures.

Fiscal year 2024 also marks the first time the Space Force has specifically budgeted for Tactically Responsive Space, and we acknowledge responsive space as an emerging need and thank Congress for your leadership in this mission area.

As the Assistant Secretary of the Air Force for Space Acquisition and Integration, I am focused on adding speed to our acquisitions and delivering our programs on cost and schedule. I recognize that I inherited several troubled programs that are behind schedule and overrun on cost. I am paying close attention to those programs.

Overall, I am proactively managing the space acquisition enterprise through weekly status reports, biweekly tag-ups with my portfolio leads, and detailed quarterly program reviews. These reviews enable me to ensure all our programs remain focused on delivering capabilities to the warfighters on cost and on schedule.

In October of 2022, I issued strategic acquisition guidance to the workforce outlining nine space acquisition tenets. You will be happy to see that one of those tenets is deliver ground systems before launch. These tenets form the basis of a new direction for space acquisition and emphasize speed and program management discipline, while addressing the fundamental issues that slow up space acquisition.

I am committed to using all the tools and authorities Congress has provided to help speed up space acquisition. This includes use of section 804 middle tier of acquisition, use of other transactional authorities, and use of the Space Acquisition Council to ensure collaboration and integration, while avoiding duplication of effort across the entire national security space enterprise.

In summary, in recognition of the evolving threats, the Department is transforming its space architecture to be more resilient, more integrated, and more capable. We continue to deliver critical capabilities in its operations for our warfighters. We are focused on adding speed to our space acquisitions and proactively overseeing and managing space acquisition portfolios.

Thank you to the committee for all your support, and I look forward to your questions.

[The prepared statement of Mr. Calvelli can be found in the Appendix on page 39.]

Mr. LAMBORN. And thank you for your testimony.

We will now hear from Dr. Christopher Scolese, Director of the National Reconnaissance Office.

The floor is yours.

**STATEMENT OF CHRISTOPHER J. SCOLESE, DIRECTOR,
NATIONAL RECONNAISSANCE OFFICE**

Dr. SCOLESE. Thank you, Chairman Lamborn, Ranking Member Moulton, and members of the committee.

It is a pleasure to appear before you today with my colleagues John Plumb, Frank Calvelli, and Tonya Wilkerson, and to represent the dedicated workforce of the National Reconnaissance Office.

Thanks to the support of Congress, the NRO is creating the most capable, diverse, and resilient overhead intelligence, surveillance, and reconnaissance constellation in our history. We are building capabilities to solve the Nation's hardest intelligence challenges. We

use cutting-edge technologies, both in space and on the ground, to deliver more information faster than ever before.

Our capabilities provide vital intelligence that can only be obtained from space. This includes geolocations and real-time situational awareness for our warfighters, high-resolution imagery that helps intelligence analysts make informed decisions, and support that aids humanitarian responses to natural disasters.

All of this helps make America and the world beyond stronger and safer. We are building innovation, agility, and resilience into everything we do. This ensures we can answer the toughest intelligence questions of today and tomorrow.

We are designing and delivering systems that can perform multiple types of intelligence missions and quickly pivot among them, whether the needs are traditional analytical support; military requirements for crises, like the events in Ukraine; or for humanitarian efforts.

Demonstration systems are proving concepts, reducing time for deployment of operational systems, and enabling us to fill key intelligence gaps more quickly.

All of this requires a skilled and dedicated workforce. I'm proud to say that our team of military, DOD, and IC [intelligence community] civilians truly lives up to our motto: Above and Beyond.

We continue to attract great people from the CIA [Central Intelligence Agency] and military, and with a cadre that is now a little more than 6 years old, we just had our best recruiting year and continue to attract outstanding interns, many of whom come to the NRO. This ensures we have a pipeline of talent and skills necessary to maintain our advantage.

The qualities I just described—innovation, agility, and resilience—are integral to our ability to stay ahead of our competitors. Our competitors are developing weapons to destroy or interfere with our satellites, as has been mentioned. To stay ahead of the competition and ensure we continue to operate in a heightened threat environment, we are modernizing our architecture on the space and ground. With the strong support of Congress over the last several years, we are improving capabilities, becoming faster, more agile, and more resilient.

These investments are already paying off. I'm happy to report that just in the last year we have fielded over five new systems demonstrating innovative capabilities, improved utilization of data, and upgraded our ground infrastructure—with even more to come this year.

The NRO is building and delivering a diversified proliferated architecture that includes large and small satellites, both government and commercial, in multiple orbits. In the next few years, we will grow from dozens of systems on orbit to hundreds. This will enable us to spend more time over a given area, minimize the time between observations, and offer more capability and a higher degree of resilience.

We are pushing boundaries and we are thinking differently. We are using automation and tools to speed the delivery of data.

We know we can't solve today's most difficult challenges on our own. We depend in our partnerships. The most critical of those is

the U.S. Space Force. Our partnership continues to grow stronger as we expand our interactions and deliver on capabilities.

Two examples of the numerous joint efforts between the Space Force and NRO are the ground moving target indication, as Mr. Calvelli mentioned, and the Silent Barker System. GMTI [Ground Moving Target Indicator] will track ground and maritime targets for the warfighter, day or night, in all kinds of weather, in the very near future. Silent Barker will provide situational awareness in space. We will be launching later this summer.

Our partnerships with allies continue to expand and provide increased capabilities that allow us to share information, provide multiple launch locations, and increase the exchange of data and technologies.

The NRO is leveraging the power of U.S. space industry, both traditional and emerging. From commercial data and launch to commodity spacecraft, industry is helping us create the architectures we are building today.

NRO initiatives, like the Strategic Commercial Enhancements Framework and the Director's Innovation Initiative, allow us to explore new and emerging capabilities and technologies with a wide range of industry, big and small. At the same time, we are ensuring the quality of materials and the integrity of the supply chain are not compromised in the name of speed.

For more than 60 years, the NRO has developed tools and technologies to bring the farthest reaches of the planet to our grasp. We are using the vantage point to find answers to some of the Nation's most important national security questions. Mr. Chairman, what was a vision a few years ago is quickly becoming a reality.

Thank you for having me today. I look forward to the committee's questions.

[The prepared statement of Dr. Scolese can be found in the Appendix on page 48.]

Mr. LAMBORN. Thank you.

And before we have our fourth and final witness, I just want to remind everybody that, as soon as we are done with one round of questions, we will recess and go upstairs to the SCIF [sensitive compartmented information facility] on the third floor and have a closed session.

Now we will hear from Tonya Wilkerson, Deputy Director of the National Geospatial-Intelligence Agency.

**STATEMENT OF TONYA P. WILKERSON, DEPUTY DIRECTOR,
NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY**

Ms. WILKERSON. Good afternoon, Chairman Lamborn, Ranking Member Moulton, and distinguished members of the subcommittee.

The National Geospatial-Intelligence Agency [NGA] is the leader in timely, accurate, and actionable geospatial intelligence [GEOINT] that provides a decisive advantage to warfighters, policy-makers, and first responders.

GEOINT goes beyond telling you what, where, and when something is happening. It also reveals how it is happening, why it matters, and what is likely to happen next.

Our principal focus is advancing GEOINT capabilities to fulfill our role as both a combat support agency and a member of the in-

telligence community. NGA's GEOINT professionals work across more than 120 locations at home and abroad. We have support teams embedded with U.S. Government agencies, combatant commands, service intelligence centers, and most service operational centers—for targeting and to allow them to navigate safely around the globe every day.

NGA has well-defined responsibilities for aeronautical and maritime safety of navigation, but we are still working to evolve the foundation GEOINT role as it applies to the space domain.

Just as NGA's predecessor agencies mapped the moon ahead of the Apollo missions, today we are working with NASA to develop the lunar geodetic system that will be the coordinate framework for accurate and safe movement on the moon.

We partner with the U.S. Space Force and U.S. Space Command to ensure GEOINT fully supports strategic intelligence assessments of adversary space and counterspace threats and activities. Our presence assists with collection management and allows us to team on future architecture requirements and career development and training of GEOINT-capable guardians.

We have seen a dramatic increase in demand for space-related GEOINT, and NGA is increasing our focus on cutting-edge analysis of our adversaries' space-related equipment and activities on Earth and in space.

This is reflected in our new motto: "Know the World, Show the Way . . . from Seabed to Space." This revision acknowledges that our changing world requires a steadfast effort across every domain, including evolving areas that require both exquisite tradecraft and our dedicated attention.

In addition to producing GEOINT analysis on adversary capabilities, NGA's foundational physical modeling of our planet directly supports the DOD by ensuring the precision and accuracy of GPS and maintaining the WGS-84 reference frame. These are the backbone for the geolocation our forces require for targeting and to allow them to navigate and operate safely around the globe.

As the volume of GEOINT data expands with the proliferation of collection systems and expansion into the space domain, the transfer of Project Maven to NGA will play an essential role to future military operations. Artificial intelligence and machine learning are capable of quickly fusing enormous amounts of data from across disparate data sets and provide meaningful answers.

NGA will further automate significant portions of dynamic collection, imagery exploitation, and reporting workflows to rapidly exploit data and anticipate activity.

NGA continues to grow and evolve its space intelligence mission through people, partnerships, and capabilities to meet current and future partner needs. We will continue to have a vested interest in the space domain, as much of our overall GEOINT mission is enabled by data from space systems.

Thank you, and I look forward to answering your questions.

[The prepared statement of Ms. Wilkerson can be found in the Appendix on page 54.]

Mr. LAMBORN. Okay. Thank you.

We will now have questions from the members of the subcommittee. I will go ahead and jump in first.

Dr. Plumb, your office owes us several reports. There are four I am specifically interested in on reclassification, space policy review, a strategy on the protection of satellites, and a report on opportunities for collaboration between United States and Israel on space. When can we expect to get these reports?

Dr. PLUMB. Thanks, Chairman Lamborn. I will just address a couple at a time here.

So, first of all, aware and tracking of the reports that we owe you, sir, and we are working on them.

1602 and 1611—1602 is the unclassified protect and defend strategy you've requested, and 1611 is the unclassified space policy review. Working on a comprehensive answer to both of those. There is obviously more equities than just my office in all of these. So, that should be out for coordination soon in the building. So, I hope to get that to you in the next few months.

The 1609 on the Space Force capabilities and classification, we might better save that for the classified session, but we are working hard on it, and I'm working with your team on this. But, as you know, there is a SAP [Special Access Program] reform effort, and I have been loath to get ahead of that.

And then, on the U.S. and Israel space cooperation piece, aware of that and I will make sure we dig into that.

Mr. LAMBORN. Okay. Thank you.

Dr. PLUMB. Thanks, sir.

Mr. LAMBORN. Mr. Calvelli, I am encouraged by many innovative acquisition approaches I have seen the Space Force taking, but I am concerned that Space Systems Command [SSC] seems to be using old approaches that do not serve a fast-paced acquisition model.

Mr. Moulton and I are planning to visit SSC on Monday in Los Angeles, where I expect we will hear more details about this, but what changes have you implemented to speed up the acquisition process out of SSC?

Mr. CALVELLI. I think you are going to be very impressed when you visit SSC. They are doing an outstanding job. They have really stepped up their game.

For example, if I look at the MEO [medium Earth orbit] missile-warning/missile-tracking capability that they are providing, it is an outstanding effort building SmallSats in medium Earth orbit. They have done some really great work on some ground systems, if you can believe that. They have done some really outstanding work in terms of where they are heading with GPS and how that program is progressing.

And so, they have taken to the nine tenets that I put out back in October. They are looking at going smaller with their systems. They are looking at going faster. They understand the direction we want to head in.

And I'm really proud of the team out that way. So, I hope you enjoy your trip out that way and see the great work that they are doing.

Mr. LAMBORN. Okay. Thank you.

And also, Mr. Calvelli, I am concerned about the incorporation of small businesses in space acquisitions. My district in Colorado Springs, for instance, is home to scores of small businesses who are

pursuing many innovative space technologies. And I know that other members of the subcommittee also represent these types of small businesses.

Can you share with the committee initiatives you have put in place to increase the participation of small businesses in space acquisition programs within your purview?

Mr. CALVELLI. Yes. So, I think the whole approach about building smaller and trying to get systems in place between, you know, less than 3 years from contract award to launch is really going to be a key to taking advantage of small business.

Right now, today, when we build a 7-year—it takes 7 years to build a satellite, and then we build the second block, and it takes another 7 years to get there. You are talking 12 to 14 years for technology refresh. If we are launching new systems and developing them in less than 3 years and launching them every 2 years, you are talking about significant opportunity for technology refresh and opportunity to on-ramp new and innovative technologies. So, that is really, fundamentally, my approach of getting at that.

Mr. LAMBORN. That is exciting. That is great to hear.

And finally, for all members of the panel—and we will start with Ms. Wilkerson and go down in this direction—as we mature the concept of space as a warfighting domain, how are you thinking about the difference between intelligence and Department of Defense operational missions? Where do you draw that line?

Ms. WILKERSON. So, thank you for the question, sir.

As a combat support agency and a member of the intelligence community, we are very well-informed of the national intelligence priorities, as well as the priorities of the warfighters. And so, we try to ensure that we are addressing the needs of both of our user sets.

Dr. SCOLESE. And a very similar answer. We principally provide capability, as you know, from space. And our requirements generally cover both the military needs and the intelligence community needs, and oftentimes we see that they overlap very significantly. So, we work very closely with the Department and the IC to make sure that our requirements satisfy their needs.

Mr. LAMBORN. And if you can say so in this setting—if not, we will hold off until we are in classified setting—but that overlap, does that create friction at times or is there a great collaboration instead of friction?

Dr. SCOLESE. We can talk more in the other session, but I would say that there is great collaboration. I mentioned Silent Barker just a little bit earlier. That is a very tight collaboration that is going to launch this year that is going to allow us to greatly improve our space domain awareness.

GMTI, as Mr. Calvelli and I mentioned, we have had that capability, but we know we have to expand it. We need to work together in order to make that truly what the warfighter needs.

Mr. LAMBORN. Okay. And quickly, Mr. Calvelli and Dr. Plumb.

Mr. CALVELLI. Yes. So, I have seen absolutely no duplication of effort. And what I have seen is just a great partnership, and the DOD relies every day on the great stuff that Chris and his team build. So, it is a great partnership out there between the IC and DOD.

Mr. LAMBORN. Great.

Dr. PLUMB. And, sir, I would just echo that and say I don't think it has ever been stronger, the cooperation/collaboration between DOD and IC. And I think this is a perfect example of how much more we can unlock with that type of relationship.

Mr. LAMBORN. Okay. Thank you all for what you do and for being here today.

Representative Moulton.

Mr. MOULTON. Thank you very much, Mr. Chairman.

And I'm going to defer most of my questions to the classified session, but just a couple of things.

Ms. Wilkerson, beginning with you, your agency has provided great support for the war in Ukraine. And everyone wants to know, what are the lessons that we are learning from this. If you had to just pick one lesson that you, specifically, in your work have taken from the war in Ukraine, what would it be?

Ms. WILKERSON. Thank you for the question, sir.

I think the one take-away would be the critical importance of partnerships, not only partnerships across the U.S. Government, but across our allies as well, and to be able to continue to meet user needs with respect to ensuring that we are doing so at speed and scale.

Mr. MOULTON. Well, that is the perfect answer to segue into my next question for Dr. Plumb.

You have talked about the overclassification of space. I know this is something you have been working on. How do you see this affecting our relationships with allies and partners and our ability to collaborate on space projects?

Dr. PLUMB. So, thank you, Ranking Member. I would say a couple of things.

One, working with allies and partners is absolutely essential in this security environment. And on space, in particular, the inability to share some classified information with highly capable allies is slowing us down, and we are working on it.

But I don't want that to be misconstrued. We do share classified information with allies. The question is, can we share more, especially for operationally relevant speeds to be able to do combined space operations?

Mr. MOULTON. Great.

Thank you, Mr. Chairman. I yield back.

Mr. LAMBORN. Okay. Now, we will hear questions from Mr. Waltz.

Mr. WALTZ. Thank you, Mr. Chairman.

Mr. Plumb, can you talk just for a moment about what is going on with spectrum and with international organizations? And do we have a strategy to deny our adversaries necessary spectrum, as it gets increasingly crowded up there? And conversely, do we have a strategy to protect spectrum that we may need and don't want to find ourselves, 5–10 years from now, with the PRC, for example, sitting in a key space?

Dr. PLUMB. So, sir, I can't—let me just answer the part that I'm partially responsible for, if that is all right. So, the—

Mr. WALTZ. And I should have asked probably, does the inter-agency? And you would have a key part of it, and that's my concern—

Dr. PLUMB. If I could just lay flat, the main concern of DOD at this moment is the issue of the 3.1 to 3.45 gigahertz portion of the spectrum, the S band. That, we have an agreement between the Secretary of Defense and the Secretary of Commerce to conduct a study as to whether this portion of the spectrum can be shared. The Department relies heavily across all of our forces on that spectrum to communicate and fight and to defend the United States.

And so, the question is, can it be shared? The question is not, can it be vacated and can we move somewhere else? I have testified at prior hearings that that would be extraordinarily costly and it would take decades just to get back to where we are now.

And it is also not a question of, can we partially vacate, by which I mean give up some portion of the spectrum. The question is, can it be shared in a way that we can do our mission and protect the homeland, and then, allow commercial entities to also work in that space.

Mr. WALTZ. I think I'm trying to get the Department and some others to think more broadly, is we are increasingly—and I think rightly—interoperable with commercial, and then, we see our adversaries, through a number of means, taking key spectrum in the commercial space, I think my concern is the Department and inter-agency is, like, hey that is a commercial issue. But we could find ourselves at a real disadvantage. Does that make sense?

Dr. PLUMB. It does. I do think, you know, the Department is focused on use of spectrum. You know, the nearest one we are focused on is, again, 3.1 to 3.45, but there are portions that folks all across this table rely on just for the space piece only. And I think your point is well taken that we need to be looking further down, further in the future, to make sure we are also protecting the next thing that might come under.

Mr. WALTZ. I think our adversaries certainly are. Separately, can you talk to—I know there are some efforts underway—I have talked to General Thompson a good bit about it, and I have raised this before in terms of modeling a CRAF for space, a civil reserve [air] fleet. I understand there was just a—can you just talk to the Department's efforts along those lines, and when you think you would have something you can come back to the committee with?

I think it is incredibly important, as we look at resiliency, redundancy, and to really have these agreements in place now, should we ever need them in a time of emergency.

Dr. PLUMB. So, first of all, fully agree; we need to be able to access our commercial space partners and their capacity and bandwidth. Maybe something like a CRAF agreement, if not exactly that.

I will say that the Secretary and Deputy Secretary have charged all of us to work on that, and different components are—you know, SSC is working on it. Director Scolese is working on it. I'm kind of working on it from a policy, overall arching piece.

I would say, as to when we could get back to you with a coherent story, I mean, we could provide where we are now, but I would say, you know, I would say in summer we could probably provide a

much more fulsome response as to where we are in each of these pieces and how they are coming together.

It is—we are all taken with it. It is very important, and I think this is the right time to make sure we are doing it.

Mr. WALTZ. Oh, great. That is good to hear. I think we are moving—we are moving in the right direction.

Just in the time I have remaining, our adversaries have clearly militarized space. I mean, let's look at the PRC's new space station and who is manning that. Do we need to rethink kind of our own protocols? Do we need to man—do we need to have manned applications and platforms, both on the moon and in low Earth orbit, with a U.S. military application and capability?

Dr. PLUMB. I haven't considered the concept of actually—you know, if you are asking me do I have to have people in orbit to defend orbit, I don't think that is correct. I think what we need to make sure is that we have the right ability—and we have the Space Force working hard on this—to protect and defend our own systems, both in space and protect and defend our troops on the ground from space-enabled threats. And we are working hard on both of those.

Mr. WALTZ. Thank you, Mr. Chairman.

Mr. LAMBORN. Thank you.

We will now have questions from Representative Vasquez.

Mr. VASQUEZ. Thank you, Mr. Chairman.

Thank you to all the witnesses for taking the time to speak with us today.

As you are well aware, space is an increasingly important domain for national security. Nowhere is that more understood than in my home district in my home State of New Mexico.

In my district, White Sands Missile Range is currently testing and developing the Deep Space Advanced Radar Capability, or the DARC, program. This impressive radar technology detects objects with extreme precision, which allows our operators to have adequate time to maneuver satellites away from debris before potential collision and give them the ability to identify potential civil and military satellites that may pose threats to our national security.

This question is for Dr. Plumb. How does White Sands Missile Range testing and development of the DARC program support our national security efforts in space?

Dr. PLUMB. Sir, the DARC program is very important, as you just pointed out. I think the ability to have good space domain awareness, including through radar capabilities, is essential to be able to do safe navigation, track orbit. And that applies not just for national security missions, but, really, for all, all space missions.

Mr. VASQUEZ. Great. And, Dr. Plumb, do you think it would be a priority of the Department of Defense to continue R&D [research and development] of the DARC program?

Dr. PLUMB. Generally, yes. I think we make sure that it works well and we continue R&D. I don't know if Mr. Calvelli might have something to add on that since that is—

Mr. VASQUEZ. Sure, Mr. Calvelli, go ahead.

Mr. CALVELLI. Yes. Thanks. Thanks for the help from the folks from your great organization, the folks out of WSMR [White Sands Missile Range].

We proved out the concept that DARC can actually work.

Mr. VASQUEZ. Sure.

Mr. CALVELLI. And thanks to great work by Johns Hopkins and APL [Applied Physics Laboratory], and those folks who developed the prototype. And because of that, we are building the systems.

Mr. VASQUEZ. Great.

Mr. CALVELLI. We are going to deploy them globally, and it is going to be something we really, really critically need to keep track of objects at GEO. So, thanks to the folks at WSMR for helping us out with that.

Mr. VASQUEZ. Absolutely. And I'm so happy to hear that. Because we want to make sure that we are continuing to fund cutting-edge, both space exploration and national security tools, at places like White Sands Missile Range, and in conjunction with some of our partners at Holloman Air Force Base and at Kirtland Air Force Base.

Not only is New Mexico an essential part of testing and developing these types of technologies, but we play an integral role in manufacturing key physical space infrastructure. Now, for example, New Mexico is one of only two domestic providers of space-qualified satellite solar cells. This industry employs hundreds of folks in New Mexico, many in the Albuquerque area, including in my district, who make this mission possible. Now, these good-paying, highly skilled jobs have contributed to over 1,000 satellites that are currently in orbit.

I have always said, if we can design it in New Mexico and test it in New Mexico, we should be able to build it in New Mexico. And through our work on this committee, I want to ensure that we will continue to be key contributors to supporting satellite-based space missions for years to come.

Dr. Plumb and Secretary Calvelli, what is the state of our current satellite production capabilities for both military and commercial use?

Mr. CALVELLI. You know, so far, it seems pretty good. I mean, the Nation experienced an economic boom in terms of the commercial space, and that has been something that we have been able to leverage, especially in the standpoint of satellite busses and being able to buy busses off production lines and add payloads to them, and get them launched quickly, like we just did with a Space Development Agency system. So, so far, from what I have seen, sir, the environment is pretty good.

Mr. VASQUEZ. Great.

Dr. Plumb.

Dr. PLUMB. I think I will just add, I fully take your point on the solar cell manufacturing and the difference between solar cells for space-qualified and ground, and the importance of being able to do that at scale.

Mr. VASQUEZ. Thank you, Dr. Plumb.

It is incredibly important that we have these domestic and very robust satellite production capabilities. And in our home State in New Mexico, and in our district, I think we are very interested in continuing to produce those.

So, thank you for your responses today.

I yield back the balance of my time. Thank you, Mr. Chairman.

Mr. LAMBORN. And thank you.
Representative Wilson.

Mr. WILSON. And thank you very much, Chairman Lamborn and Ranking Member Seth Moulton, for putting together this bipartisan hearing.

You can see we want you to succeed. And so, with that in mind, Secretary Plumb, the Secretary, the senior Department of Defense officials, and Defense Intelligence Agency officials have developed the Challenges to Security in Space 2022 report. And it points to a rapid rise of the adversary counterspace capabilities, especially for China and Russia.

We have seen demonstrations of these capabilities, including China's ability to move a defunct satellite and Russia's destruction of a satellite in November 2021. What is the DOD's assessment of China's and Russia's ability and intent to operationalize such capabilities, should a direct conflict arise? And what is DOD's assessment of the current requirement and response options, if China and Russia operationalize such capabilities? To what extent has the conflict and the invasion of Ukraine by war criminal Putin impacted Russian development?

Dr. PLUMB. Thank you, Congressman.

Just in order, on the ability of Russia or China to operationalize these capabilities, I think, from a military mindset, once we see something tested, we have to assume it has some operational capability as well. So, I think that is just a standard, conservative form of planning, and that is what we do. We are a contingency planning department.

On the DOD response options, I will just make clear—and this is not a new statement—but the Department reserves the right to respond at a time, place, and domain of our choosing, and that is across any domain—space, cyber, air, ground, land.

And your third question on how the Ukraine conflict is affecting Russia's ability, you know, my assessment there would simply be that the sanctions have made it harder for Russia to get at some type of, you know, modern chip sets and equipment, and that has set them back some, as they try to find workarounds.

Mr. WILSON. Thank you.

Again, every effort to match or meet or exceed opposition, please, we are, again, in bipartisan support.

And, Dr. Scolese, our partnerships with allies continue to expand and help to provide increased capabilities and flexibility. During the ongoing invasion of Ukraine by war criminal Putin, we have been working together with NRO systems that have provided vital support to our European partners and allies in NATO [North Atlantic Treaty Organization].

What has the NRO systems supporting our allies and partners in Europe against war criminal Putin? Are we leveraging and building relationships with our allies and partners in the Indo-Pacific area of operations with the ongoing threats of the Chinese Communist Party to Taiwan? And then, also, in the Middle East, what are we doing to recognize the regime in Iran, which still chants, "death to Israel, death to America"?

Dr. SCOLESE. Yes, sir, I can best answer that question in the next session, but at a broad level, we have very strong partner-

ships. We have learned a lot from Ukraine and how to work with our allies to both share information and share technologies to enhance our capabilities and to enhance their capabilities at the same time.

And I would like to turn a little bit of this over to Ms. Wilkerson because we work directly through them, and that is where the direct support to the allies comes from. So, our systems provide the information and they deliver it.

Mr. WILSON. Thank you. Yes.

Ms. WILKERSON. Thank you for the question.

So, as I noted earlier, one of the key critical lessons learned through the crisis has been the importance of allies, sharing with our partners, and specifically, the allies.

One of the other highlights that I would note is that the nature of commercial GEOINT, in particular, makes it especially valuable as an opportunity to be able to share and continue to strengthen the partnerships with our allies as well.

Mr. WILSON. And an unintended consequence of war criminal Putin is that we are all—NATO is enhanced with Sweden and Finland. How incredible the resources of both of those countries that we should be working so closely with.

So, I wish you well and best wishes for continued success.

I yield back.

Mr. LAMBORN. Thank you.

Now, we have questions from Representative Garamendi.

Mr. GARAMENDI. Thank you, Mr. Chairman.

And for the witnesses, thank you. Very important information and much appreciated.

My question goes to you, Ms. Wilkerson. The National Geospatial-Intelligence Agency has state-of-the-art equipment capable of providing time-critical information to firefighters. Needless to say, we have plenty of those throughout the entire Nation and, indeed, the world. But the access to such information should not be held financial hostage to other agencies. Yet, in fiscal years 2011 to 2018, FEMA [Federal Emergency Management Agency] paid nearly a million dollars, reimbursing the NGA for information. Money is not just the issue here; it is the time necessary to get the information.

We have introduced legislation called the Military Support for Fighting Wildfires Act. It is cosponsored by Ms. Jacobs and Mr. Carbajal. We introduced it last year. We are going to do it again this year.

It, basically, would require that the NGA make information readily available to our firefighters as they attempt to save our communities and our lives. Do you have a position on this issue, and can you explain to me how we can make this work?

Ms. WILKERSON. Yes, sir. Thank you for the question.

So, NGA is reimbursed only if another Federal Government agency, such as FEMA, designates NGA as a mission assigned. And it is in that instance that there would be a reimbursement. From an NGA perspective, we do not initiate reimbursement for mission support to any domestic crisis response.

As it relates to wildfire disasters, we do have two programs that support, can support wildfire disasters, and we do operate those

programs 24 by 7. And that support is not based in an event reaching a major disaster—is not based in an event reaching a major disaster classification. Our support is constant and it is not intended to incur any additional cost or manpower for wildfire support.

Mr. GARAMENDI. I appreciate your answer. We do have an administrative complexity here to make sure that information is readily available on time 24/7. And I do know you do collect it; making it available sometimes gets to be a bureaucratic difficulty.

So, we look forward to the legislation which clears all of that up.

Thank you very much, Mr. Chairman. I yield back.

Mr. LAMBORN. Thank you.

Okay. We have no other members to ask questions. So, we will take a 5-minute recess and convene in the SCIF at 2337, I believe is the room number, one floor up.

Thank you.

[Whereupon, at 3:16 p.m., the subcommittee proceeded in closed session.]

A P P E N D I X

APRIL 26, 2023

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

APRIL 26, 2023

STATEMENT OF
DR. JOHN F. PLUMB
ASSISTANT SECRETARY OF DEFENSE FOR SPACE POLICY
BEFORE THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON STRATEGIC FORCES
ON FISCAL YEAR 2024 NATIONAL SECURITY SPACE PROGRAMS
APRIL 26, 2023

Introduction

Chairman Lamborn, Ranking Member Moulton, and distinguished members of the Committee: Thank you for inviting me to testify before you on the Department's national security space programs. I am honored to appear alongside Air Force Assistant Secretary Calvelli, Director Scolese, and Vice Admiral Whitworth.

Space plays a critical role in American security, prosperity, and way of life. Space-based services support the world's financial system, scientific discoveries, and environmental monitoring. Every American uses space every single day. For the Department of Defense, all U.S. military service force structures are built assuming continued access to space. Space access enables us to provide our military with indications and warning of threats or attacks, command and control of our forces across the globe, and monitoring of adversary activities. U.S. space capabilities, such as positioning, navigation, and timing (PNT), satellite communications (SATCOM), missile warning and missile tracking, and other missions, are critical to overall military effectiveness across all domains and, therefore, to successful homeland defense, deterrence, and countering aggression. The intelligence, surveillance, and reconnaissance (ISR) support provided by space capabilities is vital to identifying and exposing aggressive activity, deterring escalation, and catalyzing international responses to crises.

The Department's Fiscal Year (FY) 2024 space budget request of \$33.3 billion is driven by the priorities outlined in the National Defense Strategy (NDS). This historic investment in space reflects a net increase of \$22.9 billion over the Future Years Defense Program (FYDP) for the U.S. Space Force and an increase of approximately 15% year to year from FY 2023 to meet emerging threats. The investments in the FY 2024 space budget request will enable the

Department of Defense to: (1) maintain the benefits provided to all from space by preserving stability in, access to, and freedom to operate in, from, and through the space domain; and (2) deter hostile uses of space that threaten the national security interests of the United States and its allies and partners, while ensuring we are prepared to prevail in conflict, if deterrence fails.

Security Environment

Today, the United States finds itself in a highly dynamic security environment characterized by intensifying strategic competition, assertive behavior by multiple competitors, rapidly evolving domains of conflict, shifting balances of power, and, as a result, a growing risk of military confrontation. Our competitors have placed space warfare and space-enabled long-range strike capabilities at the center of their strategies to coerce and, if necessary, fight the United States and its allies and partners. They seek to create a future operating environment in which they can leverage space and strike capabilities to hold at risk our forces, ports, and airfields, and to deny U.S. freedom of maneuver. The People's Republic of China (PRC) expects space-enabled long-range precision strikes will play an important role in future conflicts, and counterspace operations will be integral to potential PRC military campaigns. Space capabilities also underwrite ongoing efforts by U.S. competitors to gain advantage in "gray zone" competition, undercut U.S. leadership, and reshape global norms to their advantage.

People's Republic of China

The Department's FY 2024 budget is driven by the seriousness of our strategic competition with the PRC, which remains the most comprehensive challenge to U.S. national

security. The PRC is the greatest geopolitical challenge facing the United States because it is the only competitor with the intent and, increasingly, the capability to remake the rules-based international order. The PRC's activities on the ground and, increasingly, in space are designed to advance its global standing, strengthen the PRC's endeavor to erode U.S. influence across military, technological, economic, and diplomatic spheres, and challenge the interests and values of the United States and our allies and partners. The People's Liberation Army (PLA) views space superiority -- the ability to control the space-enabled information sphere and deny adversaries their own space-based information gathering and communication capabilities -- as a critical component of conducting modern "informatized warfare." As a result, the PRC reorganized its military in 2015 to approach space more effectively as a warfighting domain and to support the PLA's holistic approach to joint warfare.

The PLA continues to build a space architecture to enhance its ability to fight and win a modern military conflict. In 2022, the PRC conducted 62 successful space launches, placing 200 payloads into orbit, more than half of which were PRC ISR satellites. Today, the PLA benefits from more than 340 ISR satellites with optical, multispectral, radar, and radiofrequency sensors, and now owns and operates roughly half of the world's ISR systems. The PRC ISR architecture enhances the PRC's worldwide situational awareness and could support the PLA's monitoring, tracking, and targeting of U.S. and allied forces worldwide, especially in the Indo-Pacific region.

The PRC expects ISR capabilities will play an important role in future conflicts by enabling the PLA to acquire timely, high-fidelity information in order to conduct long-range precision strikes and conduct battlefield damage assessments. The PLA continues to integrate ISR, PNT, and SATCOM capabilities into its weapons and command and control (C2) systems

to provide over-the-horizon targeting information for its strike platforms in an effort to challenge U.S. freedom of maneuver on land, sea, and in the air. Recent PLA improvements to its ISR fleet enhance the PLA's ability to operate farther from the Chinese coast and to monitor forces across the globe, including U.S. aircraft carriers, expeditionary strike groups, and deployed air wings. This makes U.S. and allied forces more susceptible to long-range strike and ultimately challenges our ability to conduct joint operations, particularly in the Indo-Pacific region.

The PRC also has a robust network of space surveillance sensors on Earth capable of searching, tracking, and characterizing satellites in all Earth orbits. This network includes a variety of telescopes, radars, and other sensors that allow the PRC to support missions such as intelligence collection, ballistic missile early warning, and counterspace targeting.

The PRC views counterspace systems as a means to deny other militaries' space-based information systems and to deter and counter outside intervention during a regional conflict. The PRC has already fielded ground-based counterspace weapons, including electronic warfare systems, directed energy weapons, and direct-ascent (DA) anti-satellite (ASAT) missiles designed to disrupt, damage, and destroy U.S. satellites. The PRC has launched multiple DA-ASAT missiles, including a 2007 destructive DA-ASAT missile test in low Earth orbit (LEO), and plans to pursue DA-ASAT weapons intended to destroy satellites up to geo-synchronous Earth orbit.

The PRC is probably testing dual-use technologies in space that could be applied to counterspace missions, such as robotic arm technology that could be used for grappling other satellites, as evidenced last year when the Shijian-21 moved a derelict satellite to a graveyard orbit. The PRC continues to seek new methods, which probably include space-based kinetic

energy weapons, to hold our satellites at risk, and is developing other sophisticated capabilities to deliver effects through space, such as the PRC's fractional orbital launch of an intercontinental ballistic missile (ICBM) with a hypersonic glide vehicle from China in 2021.

Russia

Russia reorganized its military in 2015 to create a separate space force because Russia sees achieving supremacy in space as a decisive factor in winning conflicts. Russia believes the importance of space will continue to expand because of the growing role of precision weapons and satellite-supported information networks in conflict, but it seeks to avoid becoming excessively dependent on space to conduct its national missions.

Russia has more than 30 ISR satellites, including some of the world's most capable satellites for optical imagery, radar imagery, signals intelligence, and missile warning. Russia can also employ its civil and commercial remote sensing satellites to supplement military-dedicated capabilities and has sought to acquire satellite imagery from foreign companies. For example, in January 2023, the Department of Treasury sanctioned a PRC company, Spacety China, for providing a Russian-based technology firm with synthetic aperture radar satellite imagery orders over Ukraine in order to enable Wagner Group combat operations.

Russia is developing, testing, and fielding a suite of non-destructive and destructive counterspace systems to degrade or deny U.S. space-based services as a means of offsetting a perceived U.S. military advantage and deterring the United States from entering a regional conflict. Russia has fielded several ground-based lasers that can blind satellite sensors and has a wide range of ground-based electronic warfare systems that can counter the Global Positioning System (GPS), tactical and satellite communications, radars, and Western space-

enabled C2 and weapons guidance systems. Russia also considers space-enabled information collection and transmission to be strategically decisive and has taken steps to modernize its military information attack capabilities. For example, in support of Russia's illegal full-scale invasion of Ukraine in 2022, Russia conducted cyber attacks against commercial satellite networks in February 2022 to disrupt Ukrainian C2 and has sought to jam commercial SATCOM used by Ukraine.

In November 2021, Russia demonstrated the capability to destroy satellites in LEO with its test of a destructive DA-ASAT missile, which created over 1,500 pieces of trackable space debris and tens of thousands of pieces of potentially lethal but non-trackable debris, which threatens spacecraft of all nations in LEO. Russia is also reportedly developing an air-launched ASAT weapon that can target satellites in LEO. Finally, Russia tested a space-based ASAT capable of kinetically killing satellites in LEO in 2020 and is developing sophisticated dual-use orbital capabilities that could be used to conduct an attack on other countries' satellites.

While the PRC and Russia develop and field these counterspace weapons, both nations simultaneously promote false claims that they will not place weapons in space and have coordinated to propose a flawed legally binding treaty on the non-weaponization of space at the United Nations that would be unverifiable and unenforceable.

Other Challenges: Iran & the Democratic People's Republic of Korea (DPRK)

Iran recognizes the strategic value of space and counterspace capabilities and will attempt to deny the United States its use of space during a conflict. Iran has developed capabilities to jam SATCOM and GPS signals, and Iran's advancements in space launch

vehicle technology could be applied to developing a DA-ASAT missile or could shorten the timeline to an ICBM. The DPRK has also demonstrated non-kinetic counterspace capabilities, including GPS and SATCOM jamming. Under the guise of peaceful use of space, the DPRK has applied data from its space program to aid in the development of long-range and multistage ballistic missiles.

The President's Budget Request for FY 2024

Strengthening Deterrence & Building Enduring Advantages in Space

In October 2022, the Department of Defense released the unclassified version of the National Defense Strategy (NDS), which emphasized that the United States is entering a period of heightened risk and articulated an urgent imperative to strengthen deterrence. In support of this aim, the NDS outlined a strategy of integrated deterrence, which provides a framework for working seamlessly across domains, theaters, and the spectrum of conflict, as well as across all instruments of U.S. power and with allies and partners. The Department's efforts in the space domain undergird all four priorities in the NDS: (1) defending the homeland; (2) deterring strategic attacks; (3) deterring aggression while preparing to prevail in conflict; and (4) building a resilient Joint Force and defense ecosystem that can sustain U.S. strategic advantages.

The Department's FY 2024 budget request is grounded in the understanding that deterrence in space contributes to deterrence on the ground. Space is a key node for integrated deterrence because deterrence strategies rely on credible combat forces, which are underwritten by space. Strengthening deterrence through enhanced mission assurance and building enduring advantages today that sharpen the edge of national security space in the

coming years are, therefore, central to our budget request this year.

Because the space domain empowers the entire Joint Force, the Department is focused on assuring critical space-based missions by accelerating our transition to more resilient architectures and by defending critical systems against counterspace threats. The foundation of mission assurance is resilience -- being able to provide critical space-based services across the Joint Force in competition, crisis, and conflict. By focusing on the ability of space-based services to withstand, fight through, and recover quickly from disruption, DoD can continue to support the Joint Force and deny adversaries the benefit of attack and an information advantage that is critical to success in modern warfare.

Even as the Department builds resilience in space as a means to deter aggression, we must also be prepared to protect and defend our national security interests in space. Consistent with our long-standing policy, the Department will protect and defend U.S. space capabilities, along with those of our allies, partners, and the commercial sector when directed to do so. To effectively deter, and, if necessary, counter and respond to hostile acts in space, the Department is focused on protecting the whole of our space architecture, including ground nodes and networks, in addition to assets on orbit. Defending our national security interests from the growing scope and scale of space and counterspace threats also requires that we strengthen our ability to detect and credibly attribute hostile acts in, from, and to space. Providing space operators with relevant, timely space domain awareness data can help to prevent operational surprise and support efforts to protect and defend space assets.

Finally, the United States must be prepared to protect the Joint Force from attacks enabled by adversaries' increasingly sophisticated and proliferated space-based ISR networks and C2 systems. The Department of Defense is developing a range of solutions across all

domains in order to protect and defend U.S. and, as directed, allied, partner, and commercial capabilities, as well as to prevent adversaries from leveraging space-enabled targeting to attack the Joint Force. This Committee's support for the investments outlined in the President's FY 2024 budget is essential to strengthening deterrence and building the enduring advantages in space necessary to defend our systems against counterspace threats and protect the U.S. Joint Force from adversary hostile use of space.

The DoD's FY 2024 national security space budget request provides for vital space capabilities, resilient architectures, and enhanced space command and control to keep space safe for military, civilian, and commercial operations, while modernizing U.S. capabilities to secure the use of space in the face of increasing threats to U.S. national security space systems. The budget request would continue to strengthen mission assurance by accelerating the transition to resilient-by-design architectures that are diverse, proliferated, disaggregated, distributed, and protected; enhance our ability to fight through disruption by improving defensive capabilities; advance assured access to space across all orbits; invest heavily in research, development, testing, and experimentation to ensure we continue to meet emerging threats; and modernize our space architecture to further integrate space-based services across the Joint Force. Some of the highlights of the FY 2024 budget request include investments in:

- Missile Warning: \$5.0 billion to develop proliferated, resilient missile warning / missile tracking architectures, and next-generation overhead persistent infrared (OPIR) space and associated ground architectures;
- GPS Enterprise: \$1.3 billion for PNT through GPS III follow-on satellite support and development of the next-generation operational control system (OCX) for GPS III and legacy satellites;

- Launch Enterprise: \$3.0 billion to fund 15 launch vehicles and launch range upgrades; and
- Satellite Communications: \$4.7 billion for the Evolved Strategic Satellite Communications (ESS), protected, robust, secure, survivable, and jam-resistant tactical, wideband, and narrowband capabilities, and Space Development Agency's (SDA) proliferated space data transport layer.

Other Space Force investments include ground user equipment, science & technology research, personnel funding, operations and maintenance, and classified investments.

Campaigning in the Space Domain

As the United States invests in critical capabilities, the Department of Defense is actively campaigning in and through the space domain to strengthen integrated deterrence and build advantages with allies and partners as well as the commercial sector, while demonstrating responsible leadership.

Our allies and partners provide an enduring strength and asymmetric advantage that our competitors cannot match. Our allies and partners are essential to our integrated deterrence strategy. We therefore must be able to integrate, plan, and operate with our most capable allies and partners in the space domain. Combined operations require us to be able to effectively share information. The Department is reviewing the classification and disclosure policies of space-related information to overcome barriers to integration with our allies and partners.

One example of how we are strengthening military-to-military ties to our allies is through the Combined Space Operations (CSpO) Initiative, which includes defense leaders from Australia, Canada, France, Germany, New Zealand, the United Kingdom, and the United

States. In this forum, we are identifying ways to improve cooperation, coordination, and interoperability to sustain freedom of action in space, optimize resources, enhance mission assurance, and prevent conflict. During last December's CSpO Principals Board meeting, leaders emphasized the need to continue to increase information sharing to enable space operations and collaboratively address challenges to the safety and security of the domain.

The NDS also highlights the importance of partnering with the commercial sector as part of our integrated deterrence efforts. Commercial services and providers offer innovative solutions across many mission areas at potentially lower cost and with more rapid development cycles. Therefore, the Department is assessing how our missions can increasingly leverage commercial space services as one element of our broader approach to building resilience.

Lastly, day-to-day, the Department is upholding and strengthening the rules-based international order and leading in the development of new responsible behaviors that contribute to the safety, stability, security, and long-term sustainability of space activities. Because the Department is one of the world's most experienced space operators, we play a significant role in the United States' observation and demonstration of responsible space behaviors. The Department's policies and practices, such as the Secretary of Defense's Tenets of Responsible Behavior in Space memorandum, issued in 2021, serve as a key element for U.S. proposals for international measures that contribute to the safety, stability, security, and long-term sustainability of space activities. Our operational expertise also leads us to participate in United Nations' space-related committees as part of State Department-led delegations.

Most recently, the Department assisted in developing the commitment announced by the Vice President in April 2022 not to conduct destructive DA-ASAT missile testing and to work to establish this as a new international norm of responsible behavior in space. This U.S.

announcement led to a December 2022 vote at the United Nations General Assembly that gave overwhelming approval of a U.S.-sponsored resolution calling upon all States to commit not to conduct destructive DA-ASAT missile tests. One hundred and fifty-five countries voted in favor, with nine opposing, including the PRC and Russia. The Department continues to engage with allies and partners to urge the widespread adoption of this commitment. This approach to developing nonbinding norms of responsible behavior that garner broad support can support the long-term sustainability of the outer space environment directly. The Department will continue to demonstrate leadership in both the responsible use of space and stewardship of the space environment.

Conclusion

U.S. space systems are central to our ability to deter our competitors and to prevail in conflict, should deterrence fail. Our competitors have watched us, they have learned from us, they have stolen from us, and they are coming for us. But they are not ready for us today. The investments in the FY 2024 budget request are essential to equip the Department of Defense with the capabilities necessary to ensure they are not ready for us tomorrow. Thank you to the Committee for its tireless dedication to our national security and our servicemembers, and I look forward to answering your questions.

Dr. John F. Plumb
Assistant Secretary of Defense for Space Policy

Dr. John F. Plumb was confirmed in March 2022 as the first Assistant Secretary of Defense for Space Policy. In this role he is responsible for the overall supervision of policy for the Department of Defense for space warfighting. His policy portfolio encompasses the Department's strategic capabilities for integrated deterrence: space, nuclear weapons, cyber, missile defense, electromagnetic warfare, and countering weapons of mass destruction. He also serves as the Principal Cyber Advisor to the Secretary of Defense.

Dr. Plumb has served in various national security roles both in and out of uniform for nearly three decades. As an active duty US Navy submarine officer, he served on a fast attack Los Angeles-class submarine and as an instructor at the Navy's nuclear power school. He then transitioned to the Navy reserves, commanding eight different reserve units over 20 years. As a civilian he held previous roles in the Senate, the Pentagon, and on the National Security Council staff at the White House. Prior to his confirmation he spent several years working for Federally Funded Research and Development Centers, first as a Senior Engineer at the Rand Corporation, and then as Principal Director, Chief of Government Relations for the Aerospace Corporation.

He holds a B.S. in Physics from the University of Notre Dame, and an M.S. in Physics and Ph.D. in Aerospace Engineering from the University of Colorado. His academic awards include the University of Notre Dame Student Leadership Award and an American Association for the Advancement of Science (AAAS) Congressional Science & Technology Fellowship sponsored by the Institute of Navigation. His personal military decorations include the Legion of Merit, the Meritorious Service Medal, and the Navy Commendation Medal. His civil service awards include the Office of the Secretary of Defense Exceptional Public Service Award, the Department of State Superior Honor Award, and the Secretary of Energy Achievement Award.

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SUBCOMMITTEE ON STRATEGIC FORCES
HOUSE ARMED SERVICES COMMITTEE
UNITED STATES HOUSE OF REPRESENTATIVES

DEPARTMENT OF THE AIR FORCE
PRESENTATION TO THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON STRATEGIC FORCES
UNITED STATES HOUSE OF REPRESENTATIVES

SUBJECT: FY24 National Security Space Programs
STATEMENT OF: Honorable Frank Calvelli,
Assistant Secretary of the Air Force for Space Acquisition and Integration

April 26, 2023

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HOUSE ARMED SERVICES COMMITTEE
UNITED STATES HOUSE OF REPRESENTATIVES

Introduction

Chairman Lamborn, Ranking Member Moulton, and distinguished members of the Committee, thank you for inviting me to testify before you today. I am also pleased to testify alongside Secretary Plumb, Dr. Scolese, and Ms. Wilkerson.

We continue to face an unprecedented strategic competitor in China, and our space environment continues to become more congested, contested, and competitive. We have seen an exponential growth of in-space activity, including counter-space threats. To address the challenges outlined in the National Defense Strategy, the Department of the Air Force and the United States Space Force are fundamentally transforming our space architecture to be more resilient, proliferated, and integrated to meet warfighter requirements to counter the growing threat from strategic competitors.

Transforming the Space Architecture

Transforming our Space Architecture involves multiple mission areas that include changes to terrestrial infrastructure, orbital assets, and the transport of data. We are actively moving away from building a small number of highly capable but vulnerable large satellites, to a proliferated resilient **missile warning / missile tracking (MW/MT)** capability. Our resilient MW/MT focuses on tracking advanced threats by integrating critical missile tracking capabilities that previously did not exist. The Space Development Agency (SDA) and Space Systems Command (SSC) are developing the low earth orbit (LEO) and medium earth orbit (MEO) architecture through an incremental process that allows us to incorporate new technologies and get them on orbit fast. The Space Development Agency just launched the first two LEO tracking satellites this month and will launch six more by the end of this fiscal year. Thirty-nine more tracking satellites will be delivered in their next Tranche, which is set to launch in 2025. SSC's resilient MW/MT MEO portion will follow with nine satellites in two orbital planes with launches in FY26 and FY27.

As we develop this new capability, we are continuing the development of the Next Generation Geosynchronous and Next Generation Polar missile warning programs as a bridge to enable the eventual transition to the resilient MW/MT architecture.

Simultaneously we are transitioning our **space domain awareness** architecture to focus on deterring and defending against attempts to negate our critical space capabilities. We continue our Geosynchronous Space Situational Awareness Program (GSSAP), which remains our hallmark program for space domain awareness. We are adding three new radar sites (United States, Australia, and United Kingdom) with the Deep Space Advanced Radar Capability to enhance our deep-space object tracking to support space combat power employment. Additionally, we are upgrading our space tracking telescopes in the Continental United States and Hawaii as part of our Ground-Based Operational Surveillance System program. These upgrades include new cameras, better sensitivity, and better search capability. We also are collaborating with the Intelligence Community (IC) on a new GEO-based satellite system called Silent Barker that will launch this year, which provides on-orbit optical space domain awareness for orbit determination, discovery, custody, and change detection of deep space objects.

We are fundamentally transforming our **military satellite communications** architecture through disaggregation, proliferation, capacity expansion, and partnerships with allies and commercial entities.

We are designing new architectures that disaggregate the strategic and tactical missions currently found on the Advanced Extremely High Frequency satellites. These future architectures increase resiliency by reducing vulnerabilities associated with very large multi-mission satellites and increase architectural diversity via payload hosting opportunities.

The Space Development Agency proliferated transport layer will provide resilient low-latency military data connectivity to a range of warfighter platforms. The first eight of these satellites were launched in April. Another 12 will launch this June, followed by 138 more in 2024.

We continue to expand and enhance our wideband satellite communications capabilities by making ground system improvements that will increase resiliency of the Wideband Global Satellite Communications (SATCOM), or WGS, satellites 11 and 12. Additionally, we are on track to operationalize the new Protected Tactical Waveform by the end of 2024 to be used over WGS, which adds critical anti-jam capabilities for our warfighters. We are also beginning the service life extension development for two additional Mobile User Objective System satellites to extend narrowband services as interim gap-fillers as we define the future architecture.

In partnership with Norway, our Enhanced Polar System Recapitalization payload will provide protected SATCOM coverage in the North Polar Region and will launch next year. We also are beginning a commercial SATCOM partnership with Luxembourg and have cooperative agreements on the use of U.S. military SATCOM with 10 countries.

These holistic efforts enhance our ability to fight in contested and degraded operational environments through increased capacity, extended coverage, and anti-jam capabilities. Our pivot to a resilient, integrated, and proliferated military SATCOM architecture provides diverse capabilities that enable warfighters to have data transport in any environment and whenever needed in daily operations, crisis, or conflict.

We continue to build upon the success of our **Global Positioning System (GPS) program**. We have four GPS III satellites completed and in storage and are on contract to produce another 10 satellites. GPS III and IIF satellites will increase military signal power as well as produce a more resilient fourth civil signal. In FY24, we will launch and begin testing of the Navigation Technology Satellite 3, an end-to-end space-based prototype across space, ground, and user equipment segments to improve resiliency in contested environments against jamming and spoofing. We also are making progress with the development and testing of the cyber-hardened next-generation GPS ground control segment and paying careful attention to this troubled program which is years late and significantly overrun on costs.

We are transitioning our solution for **moving target indication** from the air domain to the space domain. The Long-Range Kill Chains is an FY24 new start program element that supports a proliferated space-based ground moving target indication (GMTI) capability. The U.S. Space

Force is collaborating with the IC to design, develop, deploy, and operate space-based GMTI for combatant command requirements. It will provide actionable information on adversary surface targets that the U.S. Space Force will deliver to the warfighter through the Advanced Battle Management System as an integral part of Joint All-Domain Command and Control. The space-based systems will surpass the range limitations of current air platforms and provide capabilities in contested and non-contested environments to ensure the strategic advantage provided by GMTI is available to warfighters even when facing near-peer competitors.

At the same time, we are making tough budget choices. We are reducing Next Generation Overhead Persistent Infrared (NG OPIR) Geosynchronous Earth Orbit (GEO) (NGG) space vehicle purchases from three to two, ensuring we have the resources to pivot to resilient MW/MT. The NGG and NG OPIR Polar programs successfully completed several major milestones, and the Space Based Infrared System (SBIRS) constellation continues to have positive performance, thus ensuring our critical missile warning capability. We also are delaying the purchase of additional GPS IIF satellites in FY24. The GPS constellation is healthy, with four satellites ready for launch in FY24, FY25, and FY26. This enables the U.S. Space Force to fund immediate resiliency priorities in other mission areas with no impact to the GPS military code or civil service.

Critical Capabilities Delivered in the Last Year (Jan 2022 – Present)

Over the past 15 months, the Department has provided significant new capabilities on orbit. In January 2022, we launched two SSC-developed GSSAP satellites bringing the constellation to a total of six satellites. Having two more GSSAP satellites enables the U.S. Space Force to provide immediate and precise orbital predictions of all geosynchronous objects, as well as detailed space domain awareness in the GEO belt, which is critical to our space superiority.

In July 2022, SSC launched two experimental satellites, one of which was the Wide Field of View demonstration. This new technology will increase the amount of Earth coverage to over 3,000 kilometers at any one time, an unprecedented area not previously incorporated into any missile warning platform. The data from this demonstration will be used to develop future missile warning sensors in LEO and MEO.

SSC completed the SBIRS constellation with the launch of the GEO-6 satellite in August 2022 and operational acceptance in March 2023. The robust SBIRS constellation will continue providing persistent ballistic missile warning and launch detection crucial to national defense and deterrence, thus enabling the pivot to a resilient MW/MT architecture.

In November 2022, SSC launched the second Long Duration Propulsive Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) (LDPE) mission. LDPE provides a low-cost, multi-mission propulsive platform that enables multiple prototype demonstrations. Both the LDPE and the ring-shaped payload adapter provide small satellite providers with launch opportunities more readily than ever before. This vehicle was delivered in only four years from contract award, a timeline approaching my recent guidance to drive contract scope to three years or fewer from start to launch.

In January 2023, the sixth of ten SSC-developed GPS III satellites launched. Enabled by on-orbit verification efficiencies to expedite warfighter capability delivery, Space Operations Command operationally accepted GPS III-06 just 12 days after launch.

Also, in January 2023, the Space Rapid Capabilities Office (SpRCO) launched and initialized three operational prototypes, including two for enhanced situational awareness and one cryptographic interface payload providing secure space-to-ground communications capability. These systems are the first SpRCO on-orbit assets, with all three successfully testing within two months from launch, a major accomplishment for critical rapid acquisitions.

One of the most notable achievements in space acquisition occurred when SDA successfully launched the first 10 satellites of the Proliferated Warfighter Space Architecture. On April 2, 2023, SDA delivered 8 transport layer and 2 tracking layer Tranche 0 satellites just 31 months after contract award. The second launch, to complete the 28-satellite Tranche 0, will occur Summer of 2023, providing the warfighter immersion tranche by supporting military exercises, missile tracking tests, and demonstrating technology and process feasibility. This accelerated timeline represents a necessary benchmark for space acquisitions.

Overall, in the past 15 months we launched a total of 9 National Security Space Launch missions to provide critical capability to the Nation.

Launch

Our launch programs—National Security Space Launch (NSSL) and Rocket Systems Launch Program (RSLP)—evolved tremendously over the past five years with unprecedented growth in the commercial launch market and focus on the pacing challenge. We are adapting our procurement strategies and concept of operations to best leverage emerging commercial launch capabilities to meet warfighter needs across the Department of Defense (DoD), IC, and other mission partners. We totaled seven successful NSSL launches in FY22 and are on track to exceed that count this fiscal year.

NSSL has a long and respected legacy of success, delivering reliable medium and heavy space lift for our nation's most complex payloads and demanding orbits without fail. In NSSL Phase 2, we met the Congressional mandate to end U.S. reliance on Russian-made engines by investing in new rocket technologies and expanding competition. We drove down government launch costs and provided assured access to space through two launch service providers (SpaceX and United Launch Alliance) capable of meeting all reference orbits.

We are in an exciting period of transition as FY24 marks the fifth and final order year of the NSSL Phase 2 contract during which we are ordering 20 launch services for the U.S. Space Force and National Reconnaissance Office (60 percent increase from FY23) along with the launch support required to place critical capabilities on orbit. Simultaneously, we are preparing for the next NSSL procurement phase starting in FY25. Building upon Phase 2, Phase 3 pursues a dual-lane, hybrid approach to maximize competition and use of the Nation's robust commercial launch industry as we transition to more proliferated space architectures. NSSL Phase 3 will provide assured access to space and protects capacity for the DoD's less risk-tolerant missions

with two fully certified launch service providers in one lane while allowing emerging providers to compete, when ready, for the DoD's more risk-tolerant missions in another lane. This diversification produces a resilient launch architecture that allows the U.S. Space Force to rapidly harness new technological discoveries to improve launch reliability and success.

Complementary to NSSL, RSLP primarily focuses on launching our smaller payloads (e.g., suborbital targets, experimental, demonstration), and allows us to meet the full spectrum of launch. We have access to 11 different launch service providers through RSLP and we are working to on-ramp more providers in the next year. Our ability to use space effectively relies on maintaining assured access, being the first to field necessary capabilities, and having the ability to rapidly reconstitute them, if necessary. In sum, our portfolio of launch programs continues to push the envelope to accelerate launch timelines to deliver integrated and resilient capabilities more rapidly whenever and wherever needed.

FY24 marks the first time the U.S. Space Force has specifically budgeted for Tactically Responsive Space (TacRS), acknowledging TacRS as an emerging imperative. Importantly, TacRS is more than just launch capability; it also includes the end-to-end mission for satellite, ground capability, integration activities, and operations. Together, these activities constitute a complete mission set required to deliver a space capability to the warfighter in a rapid manner, on-demand to either reconstitute or augment capabilities in a more contested environment.

We successfully completed the first TacRS demonstration, Tactically Responsive Launch-2, in June 2021 after building a demonstration satellite in 12 months and launching it 21 days after call-up. For the next demo, VICTUS NOX, we plan to build the satellite in 10 months and only have a 3.5-day call-up (60-hour activation and launch within 24 hours of an operational need). VICTUS NOX is scheduled to launch this summer. In FY24, we are investing \$60 million to demonstrate a 24-hour notification to launch timeline and to develop the operations, training, testing, acquisitions, concept of operations, and Tactics, Techniques, and Procedures required to establish an enduring TacRS capability.

Managing the Space Acquisition Enterprise

As the Assistant Secretary of the Air Force for Space Acquisition and Integration, a new role created by Congress, I am singularly focused on transforming the space acquisition enterprise to add speed to our acquisitions and meet the growing threat posed by strategic competition. There are three organizations with unique capabilities and authorities that support me: Space Systems Command (SSC), Space Development Agency (SDA), and Space Rapid Capabilities Office (SpRCO). Each has unique strengths and, in some cases, unique authorities from Congress. I am managing their programs as an integrated portfolio leveraging their strengths and authorities, in much the same way that I effectively managed space programs at the National Reconnaissance Office.

As the Space Service Acquisition Executive, I conduct reviews with each of my portfolio leads (Program Executive Officers) every two weeks to discuss the status of programs within their purview. I also hold Quarterly Program Reviews for a deeper program analysis. During these quarterly reviews, the government program managers present the technical, schedule, cost, and

staffing status, open risks and issues, upcoming activities, and an overall assessment of program health. Based on the data from the quarterlies to date—the latest in February 2023—we identified a few troubled programs to track more closely. For those programs, I require each selected program to provide a biweekly update on progress against a detailed schedule to get to a healthy status. Holistically, these reviews enable my workforce and me to ensure all our programs remain focused on delivering rapid, resilient, and integrated capabilities to our warfighters, on cost and on schedule.

In October of 2022, I issued strategic acquisition guidance to the workforce, outlining **9 Space Acquisition Tenets**. The tenets form the basis of a new direction to transform our space acquisition approach and refocus our space acquisition professionals on addressing the threat in the next decade by emphasizing speed and program management discipline. The tenets are:

- 1) Build Smaller Satellites, Smaller Ground Systems, and Minimize Non-Recurring Engineering
- 2) Get the Acquisition Strategy Correct
- 3) Enable Teamwork Between Contracting Officer and Program Manager
- 4) Award Executable Contracts
- 5) Maintain Program Stability
- 6) Avoid SAPs and Over Classifying
- 7) Deliver Ground Before Launch
- 8) Hold Industry Accountable for Results
- 9) Execute – Deliver Capabilities that Work, and Deliver them on Schedule and on Cost

To emphasize how these tenets enable speed, I derived a simple formula for going fast in space acquisition which includes:

- 1) Build smaller systems
- + 2) Use existing technology designs to minimize non-recurring engineering
- + 3) Drive contract scope to 3 years or less from start to launch
- + 4) Use fixed-price contracts

= Mission Capabilities Faster to Our Warfighters

This simple formula is the cornerstone of our approach to build resilient architectures faster with innately integrated capabilities. Together, the tenets and formula provide the vision for how our space acquisition workforce is approaching a transformation to the process of delivering space capabilities to meet and outpace the pacing challenge.

Further, thanks to Congress, I chair the Space Acquisition Council (SAC) for the Department of Defense. The SAC has been a valuable tool to ensure collaboration and integration while avoiding duplication of effort across the entire national security space enterprise across all departments. Additionally, I chair the Acquisition Strategy Panel for all Space Force programs seeking acquisition strategy changes. This forum allows us to evaluate newly proposed space systems, acquisitions, contracts, and incentive strategies to ensure that we optimize our approach

to acquisition and that all portfolio of programs remain concentrated on delivering resilient capabilities faster and more integrated to warfighters.

Finally, I am committed to using all the tools and authorities Congress has provided, which are aiding us in speeding up space acquisition and delivering capabilities to the warfighter rapidly and effectively. We will continue to leverage Middle Tier of Acquisition to quickly identify, prototype, and field innovative solutions to our challenging problems. At the same time, we are using Other Transaction Authorities to increase program flexibility, as well as the pool of possible vendors. Overall, these tools and authorities enable us to use industry practices to move faster, utilize non-traditional companies, expand flexibility, and improve affordability.

Conclusion

In recognition of the evolving threats to our space systems, the U.S. Space Force is off to a good start transforming our space architecture to be more resilient, more integrated, and more capable. I will conclude by re-emphasizing the importance of rapid space acquisitions to meet the threat posed by our strategic competitors. Coupled with taking advantage of commercial services, allied and partner opportunities, and collaboration with the IC, we will ensure we get much needed capabilities into the hands of warfighters faster.

Our competitors seem to have figured out speed. We must do the same.

Thank you to the Committee for your dedication to the Department of the Air Force and our Space Force. I look forward to your questions.

Frank Calvelli
Assistant Secretary of the Air Force for Space Acquisitions and Integration

Frank Calvelli is the Assistant Secretary of the Air Force for Space Acquisitions and Integration. He is responsible for all architecture and integration with respect to acquisition of space systems and programs in the armed forces, chairing the Space Acquisition Council, and overseeing and directing the space acquisition centers in the Department of the Air Force. He also serves as the DAF Service Acquisition Executive for Space Systems and Programs.

Mr. Calvelli has more than 34 years of experience in national security space acquisitions, operations, and leadership in the National Reconnaissance Office and the Central Intelligence Agency. He has held a variety of senior positions including satellite and ground system acquisitions, systems engineering, and mission operations.

Prior to joining the Department of the Air Force, Mr. Calvelli served for eight years as the Principal Deputy Director of the National Reconnaissance Office where he managed the day-to-day operations of the 3,500+ person Intelligence Community agency.

EDUCATION

1986 Bachelor of Science, Computer Science, State University of New York, Potsdam
1992 Master of Business Administration, Loyola University, Baltimore, Md.

AWARDS AND HONORS

Presidential Rank Award for Distinguished Service
National Intelligence Distinguished Service Medal
CIA Distinguished Career Intelligence Medal
NRO Distinguished Performance Medal

(Current as of May 2022)

UNCLASSIFIED



**Testimony of Dr. Christopher J. Scolese
Director, National Reconnaissance Office**

**House Armed Services Committee, Subcommittee on Strategic Forces
Hearing on "Fiscal Year 2024 National Security Space Programs"**

Wednesday April 26, 2023

EMBARGOED FOR PUBLIC RELEASE UNTIL HEARING DATE

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Chairman Lamborn, Ranking Member Moulton, members of the Subcommittee, it is a pleasure to be before you today and represent the dedicated workforce of the National Reconnaissance Office (NRO).

Thanks to the support of Congress and the efforts of the talented NRO workforce, I am pleased to report to you and the American people that the NRO is creating the most capable, diverse and resilient overhead intelligence, surveillance and reconnaissance (ISR) constellation in our history.

We See It, Hear It, Sense It:

At the NRO we are building the space systems that allow the U.S. to see it, hear it and sense it. Our capabilities, in space and on the ground employ cutting edge technologies to provide more information, faster than ever before to help solve the nation's hardest intelligence challenges and provide our warfighters, analysts and policymakers with real time situational awareness and vital intelligence that can only be obtained from space. From providing the warfighter geolocations and situational awareness tools, to providing high resolution imagery to intelligence analysts to inform decision making, to providing support to aid natural disaster responses such as wildfires, the men and women of the NRO are making the world and our country a stronger, safer place.

Our demonstration systems are proving concepts, reducing time for deployment of operational systems and are allowing us to fill key intelligence gaps more quickly. The integration of commercial systems into our architecture coupled with our demonstration systems make intelligence more available and sharable for our commanders on the ground and allies. The agility we are building into the architecture is allowing us to be more responsive, we are designing and delivering systems that can perform multiple types of intelligence missions enabling us to quickly pivot from supporting traditional national level analytical support, to supporting military requirements for crisis events in Ukraine, while simultaneously being able to provide support to humanitarian efforts in places like Turkey and Syria.

The men and women of the NRO are smart, creative and work tirelessly to bring ideas to life through innovation, streamlined acquisition approaches and partnerships. We tackle the toughest technological challenges so that our customers and partners can get answers to the toughest intelligence questions of today and the future. As we accomplish our mission we are good stewards of the taxpayer's dollars, achieving our 14th consecutive clean financial audit in 2022. Our blended workforce of military, DoD and IC civilians are the reason the NRO has set the standard for space based ISR for over six decades. While we are proud of our heritage, we know that staying ahead requires us to do things smarter, faster and more efficiently than ever before, and the men and women of NRO take this to heart in every aspect of our mission, to go above and beyond.

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Staying Ahead of Our Competitors:

In my previous appearances before this committee, I have reported on the increasing complexity of the space domain and the speed at which the U.S. advantage from space is being challenged, particularly by China and Russia. Our competitors are developing weapons to destroy or interfere with our satellites kinetically or via directed energy from locations on the ground and in space. This includes cyber intrusions and cyberattacks that will be a perennial threat to all of our systems. We are seeing rapid investment and advancements in the space domain from our competitors in just about every area. As Director of National Intelligence Avril Haines noted during her Annual Threat Assessment testimony to Congress earlier this spring, China's commercial space sector is on pace to become a major global competitor to U.S. and allied space industries by 2030.

To stay ahead of the competition and ensure that we can continue to operate in a heightened threat environment, the NRO with the support of Congress over the last several years, has continued to modernize our architecture in space and on the ground – to have more capabilities and to become faster, more agile and more resilient. These investments are already beginning to payoff, the NRO's future constellation is taking shape today, we are building the future now. We are growing our capabilities to help expand our intelligence advantage, while at the same time taking the steps to ensure our space systems and ground infrastructure are able to maintain operations through any contingency or threat.

Building NRO's Future Architecture Today:

The diversified, proliferated architecture we are building includes large and small satellites, both government and commercial, in multiple orbits so that we can spend more time over a given area, and minimize the time between observations, giving us both more capability and a higher degree of resilience. We are in the midst of building a new constellation that will take us from dozens of systems on orbit in 2023, to hundreds of systems on orbit in the next few years.

As we add more satellites with more capabilities and push ISR capabilities beyond what was thought to be possible, we are thinking differently about how we will task, collect and disseminate our space based intelligence. We are advancing and improving automation and multi-intelligence processes, artificial intelligence (AI) and machine learning (ML) to make sure we can deliver the right information at the right time to the right place, whether it be to the warfighter in the field, a commander on the ops floor, or an analyst at one of our Intelligence Community partners. As more data is made available, we must guard against adding complexity for our users. It is essential that we simplify interfaces and focus on the basic intelligence question. We must let machines enabled by AI and ML focus on the "what" and "how," and allow humans to focus on what they do best—answering the "why." It is why the NRO is building tools that help warfighters and analysts make sense of this data by fusing it together for better

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situational awareness and decision advantage. NRO tools are in use at every combatant command and have proven critical in supporting EUCOM's operations during the Ukraine crisis.

Mission Enhancing Partnerships:

We know we can't solve today's challenges on our own. We depend on our relationships with other government agencies, other nations, academia and the private sector to identify new opportunities to optimize our talents, tools, and effectiveness. One of the most critical of these relationships is with the U.S. Space Force. During my last appearance before the committee, I highlighted the work we are doing together to protect and defend assets in space. Since I last testified before the committee, the partnership with Space Force has only grown stronger. Today the NRO and Space Force are working hand-in-hand to shape the future of Ground Moving Target Indicators (GMTI), which will provide day, night, all weather detection and tracking of ground and maritime targets for the warfighter. Working with the Space Force and other military services, the NRO's flexible acquisition approaches will allow us to develop and acquire reliable and resilient GMTI systems at speed, delivering this critical capability to the warfighter, for the warfighter, in the very near future. I am also pleased to report to the committee that the joint NRO and Space Force SILENTBARKER system will be launching later this summer. This new capability will improve space situational awareness. These joint efforts are just a few examples where we are leveraging the best of what the Space Force and NRO have to offer to accelerate U.S. advantage in space.

Our partnerships with allies continue to expand and help to provide us increased capabilities and flexibilities. During the ongoing conflict in Ukraine, NRO systems have provided vital support to our European allies and partners in NATO. We are strengthening partnerships with traditional Five Eyes allies such as the United Kingdom, Australia, New Zealand and Canada taking advantage of multiple launch venues, shared satellite investments and exchanges of technologies and data. We are establishing and growing relationships with Japan, the Nordic countries and others who want to partner with us and contribute to our collective security.

The NRO is leveraging the power of the U.S. space industry to help us create the architecture we are building today. From commercial imagery and commercial RF, to launch services, to spacecraft, to communications, to cybersecurity and information technology, the NRO is integrating U.S. industry innovations across our lines of effort. We are working with both traditional and emerging space industry firms to help us meet mission. Our Strategic Commercial Enhancements Framework and the Director's Innovation Initiative are examples of tools we are using to help identify new technologies to help us meet mission needs. For instance, just last month the NRO awarded study contracts to a group of six commercial providers to evaluate hyperspectral imagery capabilities. As we increase our reliance on the U.S. space industry to take advantage of the speed and innovation they can bring to our

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architecture and our efforts to stay ahead of the competition, we are also paying close attention to ensuring that the quality of systems, materials and integrity of the supply chain are not compromised in the name of speed.

Conclusion:

At the NRO we have spent 60 years seeing, hearing and sensing things you can only learn from the vantage point of space. We are using that vantage point to help find the answers to some of the nation's most important national security questions. Providing our warfighters, policymakers and decision makers the intelligence they need, when they need it.

Mr. Chairman, what was a vision just a few years ago is quickly coming into focus. The future is now. I am confident that the NRO, our people and partners are all committed not to just keep pace, but to accelerate our advantage in space. The safety and security of the world and our nation are counting on it.

Thank you for having me today. I look forward to the committee's questions.

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Dr. Christopher Scolese
Director, NRO

Dr. Christopher Scolese was appointed the 19th Director of the National Reconnaissance Office (DNRO) on August 1, 2019. The DNRO provides direction, guidance, and supervision over all matters pertaining to the NRO and executes other authorities specifically delegated by the Secretary of Defense and the Director of National Intelligence.

Dr. Scolese began his government career as a United States Naval Officer in 1978, supporting a variety of Naval Nuclear Propulsion Programs for the U.S. Navy and the Department of Energy.

In 1987, following a brief period of service working in government and industry, Dr. Scolese joined the National Aeronautics and Space Administration (NASA) where he was assigned to the Goddard Space Flight Center, located in Greenbelt, Maryland. During this period, he served in a variety of senior management positions including: Earth Observing System (EOS) Systems Manager, EOS Terra Project Manager, EOS Program Manager, and Deputy Director of Flight Programs and Projects for Earth Science.

In 2001, Dr. Scolese was assigned to NASA Headquarters in Washington, D.C. where he served as the Deputy Associate Administrator in the Office of Space Science. In this position, he was responsible for the management, direction and oversight of NASA's Space Science Flight Program, mission studies, technology development, and overall contract management of the Jet Propulsion Laboratory.

In 2004, Dr. Scolese went on to become the Deputy Director, Goddard Space Flight Center, where he assisted the Director in overseeing all activities, before returning to Washington, D.C. to become NASA's Chief Engineer in 2005. As Chief Engineer, he was responsible for ensuring all development and mission operations were planned and conducted on a sound engineering basis. In 2007, he was appointed the Associate Administrator, responsible for the oversight and integration of NASA's programmatic and technical efforts. From January - July 2009, Dr. Scolese served as NASA's Acting Administrator, responsible for leading the development, design and implementation of the nation's civil space program.

In 2012, Dr. Scolese went on to serve as the Director, Goddard Space Flight Center, where he led the nation's largest organization of scientists, engineers, and technologists responsible for building spacecraft, instruments, and new technology to study Earth, the sun, our solar system, and the universe. On July 31, 2019, he retired from NASA to become the DNRO.

Dr. Scolese holds a Bachelor of Sciences degree in Electrical and Computer Engineering from the State University of New York at Buffalo, Buffalo, New York; a Master's degree in Electrical and Computer Engineering from George Washington University, Washington, D.C.; and a Ph.D. in Systems Engineering from George Washington University, Washington, D.C. Originally from Buffalo, New York, Dr. Scolese and his wife, Dianne, currently reside in Springfield, Virginia.

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Testimony of
Ms. Tonya Wilkerson
Deputy Director
National Geospatial-Intelligence Agency
before the
House Armed Services Committee
Subcommittee on Strategic Forces
Hearing on
Fiscal Year 2024 National Security Space
Programs

Wednesday, April 26, 2023



NGA
NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY



Approved for public release, NGA-U-2023-00872

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Good afternoon Chairman Lamborn, Ranking Member Moulton, and distinguished members of the Subcommittee. Thank you for the opportunity to update you on NGA's mission and support to our national security space programs.

The National Geospatial-Intelligence Agency (NGA), is the lead U.S. agency and world leader in timely, accurate, and actionable geospatial intelligence (GEOINT) that provides a decisive advantage to warfighters, policymakers, intelligence professionals and first responders. GEOINT is a highly evolved intelligence discipline that goes beyond telling you what is happening, where it is happening and when it is happening. It also reveals how it is happening, why it matters and what is likely to happen next. NGA also maintains detailed, foundational physical characterizations of our planet from ocean floors to beyond the Earth's atmosphere and provides products our forces require to navigate and operate safely every day, everywhere around the globe.

We have seen a dramatic increase in demand for space-related GEOINT, and NGA is increasing our focus on cutting edge GEOINT analysis of our adversaries' space-related equipment and activities on Earth and in space. This is reflected in our new motto, "Know the World, Show the Way ... **From Seabed to Space.**" This revision does not expand our mission, but acknowledges that our dynamic, changing world requires a steadfast effort across every domain, including evolving areas requiring our most creative tradecraft and dedicated attention.

NGA is heavily invested in both applying GEOINT data from space-based systems to national security needs and using GEOINT to contribute to space security. A vast amount of our GEOINT data sources are space-based systems that include U.S. national technical means and commercial providers. These assets enable us to provide timely warning to the warfighter and national decision makers by analyzing and reporting imminent threats in global hot spots and providing unique insight into these critical areas.

Over the past year, Russia's unprovoked invasion of Ukraine has driven a heightened demand for GEOINT products. In addition to classified reporting on the conflict, NGA has enabled a greater shared understanding in order to counter Russian disinformation by providing releasable commercial imagery and data throughout the crisis. The tremendous capabilities in the commercial sector have enhanced our ability to provide unprecedented partner access to these assets in near real-time.

NGA also facilitated agreements with commercial providers to enable partner nations access to such imagery. This included: (1) high-resolution commercial electro-optical imagery which is valuable in characterizing equipment types and performing damage assessments; and (2) Commercial Synthetic Aperture Radar imagery, which is capable of looking through nearly all-weather conditions, day or night, providing situational

intelligence when other collectors cannot, which is especially critical during the long, cloudy winter months. NGA also continues to evaluate new commercial GEOINT data and service providers for potential integration in support of current and future crises.

Many are surprised to learn about the broad role NGA has in supporting Assured Positioning, Navigation, Timing and Targeting. We lead the way for the DoD by helping ensure the precision and accuracy of GPS and maintaining the World Geodetic System 1984 (WGS-84) reference frame, which is the backbone for all geolocation. Our work improves GPS accuracy for government civil agencies, commercial industry and individual consumers, while the geodetic data we collect and manage is also required for the precision engagement of U.S. weapons systems. Our safety of navigation missions, including aeronautical and maritime, are vital to our nation's power projection and freedom of movement by ensuring the continued safe passage of servicemembers worldwide through navigation and flight information publications.

While we have well-defined responsibilities for safety of navigation in the maritime and air domains – we are still working to evolve the GEOINT foundation role as it applies to the space domain. Just as NGA's predecessor agencies mapped the moon ahead of the Apollo missions, today we are working with NASA to develop the Lunar Geodetic System that will be the coordinate framework for the accurate and safe movement on the moon.

Cislunar space and the moon's surface are drawing increasing international interest as it represents a critical region of cislunar space, presenting near- and longer-term prospects for mining natural resources, conducting scientific experiments, preparing deep-space journeys, fueling satellites and improving space communications. These interests and activities could create chaotic and unsafe conditions without standardization on the lunar surface. NGA's Lunar Geodetic System will provide that common coordinate framework to facilitate accurate and safe movement. As space becomes an increasingly populated domain, the importance of NGA's support to space operations will only grow.

NGA's 14,500 GEOINT professionals work across more than 100 locations in the U.S. and 20 international locations. We have support teams embedded within many government agencies, each Combatant Command headquarters, service intelligence centers and most service operational headquarters; to include direct-support to the United States Space Force.

Whether faced with a pandemic or other crisis, NGA's culture of service to country powers a passion that helps ensure mission accomplishment while delivering on our commitment to diversity and inclusion. Despite the technological advantage we might have, we must not forget that it is the unrivaled analytical experience and expertise our

workforce brings that cannot be replicated. To evolve a workforce with the technical and substantive expertise required to achieve and sustain GEOINT supremacy in the face of ever-changing worldwide threats, we aggressively collaborate with dozens of universities and colleges to connect with STEM talent, employing every tool available, including the awarding of academic grants, connecting with university-affiliated research centers and establishing our NGA Visiting Scientist program to ensure we adapt to the changing world of big data and commercial imagery and data growth.

NGA does not own or operate space systems, but we rely heavily on the data that comes from space systems and contribute to understanding space threats through our GEOINT work as a combat support agency for military activities from the bottom of the ocean and out into space. We partner with US Space Force and USSPACECOM, to ensure that GEOINT plays the fullest possible role in their understanding of adversary space and counterspace threats and activities. Our embedded presence not only brings the full power of GEOINT, including analysis, collection management, and requirements development, but it allows us to directly team on the career development and training of GEOINT-capable service members, including Guardians.

We know the magnitude of our responsibility to meet the operational and intelligence needs of those who rely on our GEOINT expertise, from the tactical edge to the Oval Office. Central to this responsibility is vigorous stewardship of the resources that you authorize supporting our core operational, intelligence, and safety of navigation missions.

We also value and recognize that the corporate and technical knowledge of the space community is an evolving resource. With nascent training programs across the community, NGA has already developed space-related GEOINT training courses for space professionals in the DoD, IC and Allied partners. We are on track to graduate over 300 students this year and we are in the process of finalizing a follow-on course for our customers and partners by the end of the fiscal year.

Space acquisition has always been complex. While we prioritize our future architecture requirements to ensure the intelligence needs of our GEOINT customers are met, we concurrently partner with existing capability partners, especially National technical means and commercial, to ensure we can efficiently use available systems as the amount of GEOINT data is rapidly expanding. The transfer of Project Maven to NGA will also play an essential role to future military operations. Artificial intelligence and machine learning are designed to fuse enormous amounts of data from across disparate data sets and provide meaningful answers. We appreciate your continued support of this transition where we advance Maven from an R&D AI project to a sustained, operationalized, and interoperable program of record.

NGA will automate significant portions of imagery exploitation and reporting workflows, to include leveraging computer vision to rapidly exploit data; using advanced modeling techniques to understand, correlate and predict activity; and integrating automation and modeling capabilities to prompt dynamic collection.

While we believe in our strengths as an agency, GEOINT is unquestionably bigger than a singular agency, and we are better when we work with our partners in industry and academia to find innovative solutions to hard geospatial-intelligence problems.

NGA continues to grow and evolve its space intelligence mission through people, partnerships, and capabilities to meet current and future customer needs. We will continue to have a vested interest in the space domain, as much of our overall GEOINT mission is enabled by data from space systems.

Thank you and I look forward to answering your questions.

Tonya P. Wilkerson
Deputy Director, National Geospatial-Intelligence Agency

Tonya P. Wilkerson serves as the ninth Deputy Director of the National Geospatial-Intelligence Agency. She was sworn in Dec. 2, 2021. Ms. Wilkerson brings a wealth of knowledge and over three decades of experience across the Intelligence Community, including leadership skills, experience across multiple mission areas, and deep expertise in the space sector.

From February to November 2021, Ms. Wilkerson served as the Associate Deputy Director of the Central Intelligence Agency for Science and Technology/Strategy. She also held many prominent positions within the National Reconnaissance Office spanning a range of activities, including research and development, acquisitions, and operations. Ms. Wilkerson served as a change management leader within the NRO during a time of significant and complex structural transition.

Ms. Wilkerson held simultaneous leadership roles in the NRO and CIA's Directorate of Science & Technology. She successfully leveraged her technical skills, combined with her background in space operations, to enhance technical capabilities within the DS&T.

Ms. Wilkerson holds a bachelor's degree in electrical engineering from Virginia Polytechnic Institute and State University and a master's degree in engineering management from George Washington University.

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

APRIL 26, 2023

QUESTIONS SUBMITTED BY MS. STEFANIK

Ms. STEFANIK. Dr. Scolese, the NDAA 2023 clarified the National Reconnaissance Office and the Director of the National Geospatial-Intelligence Agency, shall leverage to the extent possible domestic commercial geospatial-intelligence services and domestic commercial satellite imagery, and that domestic commercial services shall include companies operating in the U.S. that have active mitigation agreements pursuant to the National Industrial Security Program. In your upcoming competitions for commercial services, including the upcoming commercial radar layer imagery contract, will you confirm that the NRO will comply with this provision of law and allow all domestic commercial service providers as defined above to participate?

Dr. SCOLESE. [No answer was available at the time of printing.]

QUESTIONS SUBMITTED BY MR. CARBAJAL

Mr. CARBAJAL. I think we'd all agree that innovation has been a key contributor to our military's success. Today there's no shortage of innovation in our country, but it seems the department has struggled to leverage its full potential. The term "valley of death" is widely used to acknowledge the difficulty to transition cutting-edge technologies from concepts and demonstrations to programs of record. What do you see as key contributors to the "valley of death" in the area of space and how are you working to bridge the valley across Space Systems Command, the Space Rapid Capabilities Office, and the Space Development Agency?

Mr. CALVELLI. One of the biggest contributors to the "valley of death" for space systems is the historically lengthy time from contract award to launch. Prolonged space system development timelines reduce the number of opportunities to bring new cutting-edge technologies into operational systems. It has commonly taken seven years to build and launch a satellite. That means we might have to wait that many years to incorporate promising new technology for a given mission, which is simply too long.

My tenet of building smaller is intended to enable our acquisition organizations to develop and launch new systems faster. Moving faster inherently increases the frequency of opportunities to onramp new and innovative technologies from our research labs and industry, thereby helping to bridge the "valley of death." Achieving my target of no more than three years from contract award to launch will substantially increase our ability to transition demonstrated technology into operational capabilities.

To emphasize how my space acquisition tenets enable speed, I derived a simple formula for going fast in space acquisition, which includes: 1) Build smaller systems + 2) Use existing technology designs to minimize non-recurring engineering + 3) Drive contract scope to 3 years or less from start to launch + 4) Use fixed-price contracts = Mission Capabilities Faster to Our Warfighters

Mr. CARBAJAL. Continuing the focus on innovation, many around the world watched SpaceX launch the most powerful rocket in human history ... it concluded in a "rapid unscheduled disassembly" but was hailed as a massive success. SpaceX and others in the industry are leveraging an approach to go fast, accept failures, apply lessons learned, and keep going. In your testimony, you mentioned the need for rapid space acquisitions, and I agree with the need to pick up our pace. As industry has demonstrated, in order to move along faster, you have to accept some risk. Can you explain your approach to risk and provide examples where your approach has been implemented?

Mr. CALVELLI. I published the 9 Tenets and the Simple Formula memos for the Space Acquisition Workforce to emphasize what they need to do to be more agile and responsive. This is a culture change.

By building smaller and on shorter timelines, we are able to take smart risks and plan in the potential for some failures along the way while also increasing the rate and capacity of capability delivery to our warfighters.

We also need to share this risk with industry. Industry must be onboard with rapid contract delivery, fixed priced contracts, providing realistic bids, and bidding on contracts on which they have mission area experience.

The U.S. Space Force's Space Development Agency approach to satellite acquisition has spread the risk by awarding tranches of satellites to different vendors for a proliferated constellation of low-Earth orbit satellites. They have capitalized on harnessing commercial development and shorter timeframes to enhance resiliency and add capabilities as the threat evolves.

Mr. CARBAJAL. There's been a lot of focus on the amount we spend on the Department of Defense. Some are saying we need to curb our spending, while others talk about the rise of near-peer threats and a need to invest in our outdated systems from the cold war. Last September, the GAO published a report on the acquisition of commercial satellite imagery across the Intelligence Community and the Department of Defense. The report points to the possibility of the same image being purchased multiple times, which wouldn't be the best use of taxpayer dollars. How are you working together across the NGA and NRO to ensure DOD requirements are being met across the combatant commanders to minimize duplicative purchases of imagery?

Dr. SCOLESE. [No answer was available at the time of printing.]

Mr. CARBAJAL. I think we'd all agree that innovation has been a key contributor to our military's success. Today there's no shortage of innovation in our country, but it seems the department has struggled to leverage its full potential. The term "valley of death" is widely used to acknowledge the difficulty to transition cutting-edge technologies from concepts and demonstrations to programs of record. What do you see as key contributors to the "valley of death" in the area of space and how are you working to bridge the valley across Space Systems Command, the Space Rapid Capabilities Office, and the Space Development Agency?

Dr. SCOLESE. [No answer was available at the time of printing.]

Mr. CARBAJAL. There's been a lot of focus on the amount we spend on the Department of Defense. Some are saying we need to curb our spending, while others talk about the rise of near-peer threats and a need to invest in our outdated systems from the cold war. Last September, the GAO published a report on the acquisition of commercial satellite imagery across the Intelligence Community and the Department of Defense. The report points to the possibility of the same image being purchased multiple times, which wouldn't be the best use of taxpayer dollars. How are you working together across the NGA and NRO to ensure DOD requirements are being met across the combatant commanders to minimize duplicative purchases of imagery?

Ms. WILKERSON. Congressman Carbajal, thank you for your question. NGA and NRO work closely to ensure our processes and plans for the acquisition of commercial imagery remain aligned. NGA's most important steps to mitigate uncoordinated purchases has been the establishment of a commercial GEOINT Requirements Process for the user community. This process allows the GEOINT community to submit GEOINT needs that could be satisfied by commercial solutions, including imagery, products, or services. These needs are prioritized to enable collaborative procurements and licensing terms that reduce duplicative purchases and maximize mission utility across the community. NGA also gathers information on current and planned purchases of commercial GEOINT by other government organizations as part of our annual user data calls. These efforts provide the transparency and coordination necessary to enable informed acquisition decisions across the GEOINT user community.

I'll also highlight that DOD and IC policies and instructions direct NRO to coordinate its commercial GEOINT acquisition activities with GNA. This partnership enables collaboration in situations where other government agencies engage NRO for independent procurement of commercial GEOINT.

QUESTIONS SUBMITTED BY MR. STRONG

Mr. STRONG. It's my understanding the missions in Lane 1 of Phase 3 allow for new entrants to bid for less complicated missions while Lane 2 of Phase 3 represents the most difficult missions and are therefore reserved for experienced launch providers. For Lane 2 missions, why is it important that providers selected are experienced and meet all NSSL requirements?

Mr. CALVELLI. NSSL missions require assured access to space, so Lane 2 providers are incentivized to meet all unique gov't requirements, to include Western Range capabilities and vertical integration.

- They have more challenging mission requirements, necessitating full mission assurance (e.g., Space Based Infrared System, USSF classified missions, NRO missions).

- To bid on Lane 2 does not require prior experience, but requires fully-certified launch vehicles in accordance with the New Entrant Certification Guide prior to launching an NSSL Phase 3 Lane 2 mission.

This strategy avoids the possibility of providers optimizing to meet some, but not all requirements, resulting in potential gaps in DOD launch capabilities

Mr. STRONG. Please explain the importance of ensuring all national security space launch providers have the capability to launch from our Western range at Vandenberg to reach polar orbits. Do you expect the Space Force to maintain this requirement into Phase 4?

Mr. CALVELLI. Currently, the USSF expects to maintain the Western Range requirement for all Phase 3 Lane 2 providers. Phase 3 Lane 1 (IDIQ) providers will not be required to maintain launch capability from the Western Range. The only instance that would require a Lane 1 provider to launch from the Western Range is when a provider bids on a Task Order for a Western Range mission.

- The Western Range maintains resiliency by providing an additional site to launch from in the event of an anomaly or other event that denies the use of Cape Canaveral Space Force Station, FL.
- Many critical missions manifested on NSSL Phase 3 require launches from the Western Range at Vandenberg Space Force Base, CA since its location allows for a more direct insertion into polar and retrograde orbits.
- This location also increases the payload mass that a given launch vehicle may deliver in a single launch to these specific orbits.

Mr. STRONG. This committee was recently briefed by Space Force officials who indicated that adding a third launch provider in Lane 2 would likely increase launch costs by more than \$5 billion, which could instead be used to buy 330 SDA satellites, and that three launch awards would not properly incentivize industry to bid the best prices. Please explain how the Space Force came to this conclusion.

Mr. CALVELLI. Adding a third provider to NSSL Phase 3 Lane 2 will inherently increase costs. The Space Force based its cost estimate for adding a third provider to Lane 2 on the following parameters:

- Phase 2 actuals (plus escalation) to calculate estimates for:
 - 8 years of launch service support (FY25–FY32) for an additional launch service provider
- Launch service support pays for NSSL-unique costs not directly associated with any one mission (e.g., maintenance of secure facilities, support to west coast launch capability, and vertical integration, etc.).
 - 8 years award fee (FY25–FY32) for an additional launch service provider
 - 8 years of fleet surveillance (FY25–FY32) on an additional launch system
- Assumed space vehicles need to be designed/compatible to fly on all three launch systems for max resiliency (tri-integration); drives additional cost on both the launch vehicle and space vehicle sides, and demands additional resources (both government and contractor) to manage multiple, simultaneous efforts
- Assumed additional overhead for program management and other Program Executive Office support to manage a third provider
- Assumed potential increase in launch service costs if providers are less incentivized to competitively bid given all bidders will win something The SDA comparison was only provided as an example to show the capability tradeoff between adding a third provider and on-orbit assets.