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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2025
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED EIGHTEENTH CONGRESS
SECOND SESSION
—
SUBCOMMITTEE ON STRATEGIC FORCES HEARING
ON
**FY25 BUDGET REQUEST FOR NATIONAL
SECURITY SPACE PROGRAMS**
—

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FY25 BUDGET REQUEST FOR NATIONAL SECURITY SPACE PROGRAMS

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Wednesday, May 1, 2024.

The subcommittee met, pursuant to call, at 3:31 p.m., in room 2118, 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, COMMITTEE ON ARMED SERVICES

Mr. LAMBORN. The meeting will come to order.

The Strategic Forces Subcommittee meets today to review the fiscal year 2025 budget request for National Security Space Programs.

Good afternoon to our witnesses, Dr. Plumb, Mr. Calvelli, Dr. Meink, and Ms. Wilkerson. Thank you all for being here and thank you for your service to our country.

Today is Dr. Plumb's last appearance before this subcommittee, and maybe even his last public appearance as the first Assistant Secretary of Defense for Space Policy. We thank you for your service. I want to thank you for your efforts over the years to normalize the way the Department handles the space domain. Your work on the Space Strategic Review and Space Classification Guidance will serve as policy foundation for those who succeed you. As you stated in your Space Policy Review last year, our national security space posture considers "space as a distinct operational domain of national military power."

Now, long ago, our adversaries determined that space is vital to the Joint Forces' operation, and they have spent the last several years developing counter-space weapons to threaten our troops. Both China and Russia have weaponized space, and we must catch up to contend with this new reality.

Unfortunately, our governance structures present many hurdles to maintaining space superiority. We have redefined the space domain from a support function to a distinct operational domain. And the policies and directives that underpin who does what have not kept pace.

Many of these internal documents were last updated a decade ago. A decade ago we didn't have a Space Force, and SpaceX hadn't yet demonstrated a first stage landing. Technology and how we think about space has grown by leaps and bounds since then.

For example, I am concerned about how we get space-based information into the hands of the warfighters on a tactically relevant timeline. Given the retirement of the JSTARS [Joint Surveillance Target Attack Radar System] platform beginning in the mid-2020s, the Department decided in the fiscal year 2023 budget request to transition Ground Moving Target Indication, GMTI, from an air platform to a space-based capability.

Since the NRO [National Reconnaissance Office] is procuring this new system, does that mean NGA [National Geospatial Agency] should serve its traditional role as clearinghouse for Joint Force request of scarce national assets?

Or as you, Mr. Calvelli, have argued, is this a purely title 10 mission that needs to be tasked, owned, and operated by the Department of Defense?

This is not a trivial bureaucratic turf war. What we decide here will set the pattern for how we handle the transition to space from other previously air-based missions. It won't surprise anyone to hear that this committee believes that the GMTI mission, and any future systems to follow, must be tasked and controlled by the Department of Defense.

Last year's bill established the Moving Target Indication Working Group, co-chaired by the Space Force and the Joint Staff. So, I look forward to hearing all of your perspectives on this esoteric but essential issue.

Further, many of the technological advancements that are driving us to shift these missions to space are being developed by the cutting edge commercial space industry. We now have companies that want to provide not only launch services and communications, but imagery, and rendezvous, and proximity operations. This committee has long been a proponent of taking as much advantage of these commercial capabilities as possible.

I was glad to see your office, Dr. Plumb, and the Space Force released strategies to take advantage of these commercial developments last month.

I look forward to hearing from our witnesses about how they are thinking about these commercial capabilities and, specifically, how they plan to integrate them with the existing government architecture. In a world of limited budgets, it will become even more critical for the entire national security space enterprise to figure out how they leverage these commercial companies to improve.

I now recognize Ranking Member Moulton for his opening comments.

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

Mr. MOULTON. Thank you, Chairman Lamborn. And welcome to our panel of witnesses.

Before I begin my remarks, I also want to comment on Dr. Plumb. I was a little worried you were going to say it is his last public appearance ever. And we certainly hope that is not the case because you have been an amazing public servant, and we have been very, very lucky to have you.

I, personally, have learned a lot from you. And I was, personally, disappointed when you said you were going to leave, although you have every right to do what is right for your family. But we will miss you.

You have helped turn around the space enterprise. I am very confident with our course right now. I wasn't confident 5 years ago, and you have been a huge part of making that, that change.

So, thank you so much for your service.

Our national security space architecture is undergoing a significant transformation, a transformation necessary because everyday American life is deeply reliant on space. The Global Positioning System, GPS, probably helped everyone in this room get somewhere today. And it also provides necessary timing information to nearly every banking and financial system worldwide.

And it is no secret that most weapons systems in the Department of Defense inventory require a GPS signal as well.

In part because of this overall reliance, our adversaries have been developing, deploying, and demonstrating capabilities in space and on Earth to deny, degrade, and destroy U.S. satellites. In just the past two years the People's Republic of China has almost doubled their number of satellites on orbit to 400, with plans for nearly 1,000 by 2030. And they include capabilities with inherently offensive applications.

And as we all know now, due to what was essentially an intelligence leak from Congress, Russia is developing a nuclear weapon in space. If launched, it would be in direct violation of the Outer Space Treaty. And if detonated, it would degrade or destroy nearly every satellite in its path.

These advancements by our adversaries have required a transformation to a more proliferated, resilient, and protected U.S. architecture. In addition, the U.S. commercial market has exploded in the past 5 years.

SpaceX is probably best known, but there are companies outpacing DoD in innovation across the board, whether that be in satellite communications, remote sensing, Space Command awareness, or in developing capabilities to defend and protect our existing exquisite satellites on orbit today.

While this subcommittee has been pushing both the DoD and intelligence community to fully embrace commercial capabilities, that culture shift has been met with considerable resistance. That is why I am very encouraged by the release of both the DoD and Space Force commercial space strategies. It is not enough to simply award contracts, we must have a plan to fully integrate these innovative capabilities into government systems to help reinforce our national advantage in space.

We also continue to make significant progress with our incredible network of allies and partners. The U.S. must continue to lead by example on establishing norms of behavior for responsible operations in space.

But not to diminish this progress overall, there are some areas we should continue to watch closely. In addition to the pattern of large satellite programs being late and over budget, the ground system architecture so frequently comes as an afterthought. We have been notified yet again of delays to the Next Generation Oper-

ational Ground Control Segment, the modern cybersecure ground system to operate GPS satellites. OCX [Next-Generation operational control segment] was supposed to be delivered in 2016 for 3.9 billion. Now 8 years later, and at almost double that cost, we are still waiting.

Unfortunately, OCX is the most egregious case, but others, such as ATLAS [Advanced Tracking and Launch Analysis System], are also experiencing delays and cost overruns.

Mr. Calvelli, I would like to understand how you are addressing these issues holistically across the Space Force.

Another area this subcommittee must watch is something the chairman mentioned, the jurisdictional divide between traditional space-based intelligence collection versus DoD's [Department of Defense] use of the domain for tactical applications. The latter is somewhat a new phenomenon. Tactical missions like surveillance of ground targets are now moving from land, sea, or air platforms, into orbit.

We must ensure that Government policy does not assume that all space assets are formal intelligence or title 50 assets or we may accidentally block our Combatant Commanders from getting targeting information quickly enough to use it, or block the services from fully taking advantage of commercial imaging and sensing.

Space is a fascinating and infinite domain. Until recently, we only really 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.

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

I look forward today to today's discussion with our witnesses on how best to maintain U.S. superiority in space.

Thank you, Mr. Chairman.

Mr. LAMBORN. Thank you.

We now turn to our witnesses. Your prepared statements will be made part of the record.

And it is doubtful that we will be able to have the time to have a closed session because we do have votes in about 50 minutes. So, we will have time, though, to have a round of questions from ourselves as Members of the committee and then go from there.

I would ask that you all keep your statements to 4 minutes or less rather than 5, just for the sake of time.

Dr. Plumb, you are recognized.

STATEMENT OF THE HONORABLE DR. JOHN F. PLUMB, ASSISTANT SECRETARY OF DEFENSE FOR SPACE POLICY, OFFICE OF THE UNDER SECRETARY OF DEFENSE FOR POLICY

Dr. PLUMB. Well, thank you very much, Mr. Chairman, and Ranking Member Moulton, distinguished members of the committee. I appreciate this chance to testify one last time here on the 2025 space budget for the Department.

This is my last time testifying. Hopefully, not my last public appearance, sir. I will be departing later this month. But it has been a true privilege to serve. And I have been heartened by the bipartisan approach this committee has taken to space and the defense issues in particular.

And I will say again, I have told you both personally, but thank you. It means a lot to the country. And I think one of the reasons we have been able to move forward so much is because of, of that bipartisan approach. So, I deeply appreciate it.

We are clearly in a time of rapid change in the space strategic environment, and it does not favor those who are slow or resistant to change. China and Russia are both rapidly fielding space and counter-space capabilities to hold the Joint Force at risk and to deny us the space-based services that we rely on.

The scale and scope of these threats present significant risk to the American people, to our national interests, and to our allies and partners.

The President's fiscal year 2025 budget requests \$33.7 billion for space to help meet these challenges. Some of these critical investments include 2.4 billion for national security space launch; 1.5 billion for more resilient Position Navigation and Timing, PNT; 4.2 billion for more resilient and protected SATCOM [satellite communications], as well as the Space Development Agency's proliferated Low Earth Orbit transport layer; 4.7 billion to develop new missile warning/missile tracking architectures; and then 12.3 billion for a range of other capabilities to increase resiliency of our existing architectures and to protect our interests in space during competition in crisis and in conflict.

Now, in addition to these investments I just wanted to touch on the significant progress we have made over the last 2 years on what has become four key strategy and policy priorities.

I have detailed those in length in my written testimony, but space control, space cooperation, space classification, and commercial space integration.

We have obtained presidential guidance to ensure our space missions and protect and defend the Joint Force from space-enabled attacks.

We have greatly expanded our space cooperation with allies and partners, charting a path towards true combined operations in space that will strengthen collective deterrence.

We have overhauled the Department's space classification policy to remove unnecessary barriers to information flow throughout the Joint Force, barriers with our industry partners and, frankly, just barriers within the Department alone.

We have released the first ever DoD Commercial Space Integration Strategy to harness the sector's incredible innovation to enhance our resiliency.

Going forward, the Department will continue to press on all four lines of effort. I believe the progress we have made and the foundation we have laid here will pay dividends for years to come.

So, in closing, and aware of the time, just thank you again and the committee for your partnership, and your tireless dedication to the Department and our service members. And I look forward to this hearing and to answering your questions.

[The prepared statement of Secretary Plumb can be found in the Appendix on page 29.]

Mr. LAMBORN. Thank you.

Mr. Calvelli, you are recognized.

STATEMENT OF THE HONORABLE FRANK CALVELLI, ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION AND INTEGRATION, OFFICE OF THE SECRETARY OF THE AIR FORCE

Mr. CALVELLI. Chairman Lamborn, Ranking Member Moulton, and distinguished members of the subcommittee, thank you for inviting me to testify before you today.

With the growing threats in space, we must continue to transform our space architecture to be more proliferated, more resilient, so that space can be always counted on during times of peace, crisis, or conflict.

As the service acquisition executive for space, I am focused on driving speed into acquisitions and delivering programs on cost and schedule.

I'd like to highlight some of the progress we have made in the past year since I, I last testified.

Since the spring of 2023, the Space Development Agency has delivered 27 satellites to orbit, nearly all of them in around 3 years from contract award to launch. This includes eight new missile warning/missile tracking satellites and 19 data transport satellites. And SDA [Space Development Agency] recently demonstrated the first ever Link 16 network connection from space.

The Space Rapid Capabilities Office completed and is in the process of fielding the first 11 of 24 low cost transportable terrestrial satellite jammers -- terrestrial satellite communications jammers. These jammers went from contract award to fielding in about 18 months.

Meanwhile, Space Systems Command continues to make excellent progress in modernizing both our missile warning and MILSATCOM [military satellite communications] architectures to be more resilient. Just a few weeks ago Space Systems Command launched the first weather system follow-on microwave satellite to support the pivot to a more resilient, disaggregated, hybrid weather architecture to meet warfighter needs.

Last September, SSC's [Space Systems Command] technical response to the space mission, VICTUS NOX, demonstrated the ability to go from the factory floor to on-orbit operations in around 5 days.

And since last April there have been seven national security space launches that delivered critical warfighting capabilities to orbit.

And, additionally, we continue to take advantage of the strong space industrial base, including awarding contracts to non-traditional space companies and implementing our recently published commercial space strategy.

Simultaneously, we are aggressively tackling challenging programs to get them over the finish line. We are focused on delivering the GPS next generation Operational Control Segment, also

known as OCX, and we are making progress towards getting the system ready to commence operations in 2025.

Another one of our challenging programs that was mentioned was ATLAS. We have made significant progress since we broke it up into more manageable deliverables. The program is on schedule to incrementally deliver Space Command awareness, command and control capabilities next year to enable decommissioning of SPADOC [Space Defense Operations Center].

We have also proven we can build small satellites quickly. However, as we begin to deliver the next tranche of SDA satellites this fall, getting the military services to adopt and use these satellites will be key. It doesn't matter how fast you use them if no one uses them.

Likewise, our ability to maintain assured access to space for our space capabilities remains paramount. And launch providers must be ready to scale and meet the increasing demand.

Finally, we are working to move programs out of the Special Access Program stovepipes thanks to John and his space classification policy update in December. This will improve our ability to integrate space for other domains and enable better sharing with our allies.

As we continue to drive speed into our acquisitions, our job and our top priority needs to stay focused on delivering programs on cost and schedule. We are going to do this by, first, ensuring that our action strategies and request for proposal documents are realistic and executable; by implementing a source selection strategy that leads to awarding contracts with achievable cost and schedule baselines.

There is no better way to deliver on schedule than actually getting it right up front, and then, once under contract, proactively managing the program to deliver the system that works and deliver it on cost and on schedule.

Given the threats and the increased capabilities of our competitors, it is critical that we remain focused on delivering programs on cost and schedule.

Thank you for your time today. I look forward to your questions. [The prepared statement of Secretary Calvelli can be found in the Appendix on page 44.]

Mr. LAMBORN. Thank you.

Dr. Meink, you are recognized.

**STATEMENT OF DR. TROY E. MEINK, PRINCIPAL DEPUTY
DIRECTOR, NATIONAL RECONNAISSANCE OFFICE**

Dr. MEINK. Chairman Lamborn, Ranking Member Moulton, and distinguished members of the committee, it is a pleasure to be here today before you. And it is also a pleasure to represent the people of the National Reconnaissance Office.

For more than 60 years, the NRO has been developing tools and techniques that advance our national security. Today we are building on that legacy to innovate and make the United States even safer and stronger. Space-based intelligence has become a primary, if "the" primary, means of collection in denied areas.

This is especially critical as our competitors are seeking to deny our strategic advantage in space. With Congress' support, and with

the continued innovation at the NRO we will ensure America retains its strategic advantage in space.

Our fiscal year 2025 budget request aims to keep the United States a world leader in space-based intelligence, surveillance, and reconnaissance. It prioritizes investments in a diverse and resilient constellation to meet the needs of the warfighter, intelligence community, and our allies.

We are committed to using taxpayer dollars effectively and efficiently. I am proud to report that the NRO has just received our 15th consecutive clean audit for fiscal year 2023.

Our effectiveness and efficiencies are really a result of the title 10 and title 50 authorities that we have, as NRO is both the Defense Intelligence -- part of the Defense Intelligence Enterprise and the Intelligence Community.

Our investments in tools, technologies, both on the ground and on orbit, ensure our customers get the information they need, where they need it, faster than ever before.

With the support of Congress, the NRO will continue to invest in government-engineered and industry-built satellites that are resilient by design; increasing partnerships that allow us to maximize our impact; and developing the world's most advanced tools, information technology, and communications networks, again allowing us to fuse critical data and deliver it to our customers any place on Earth.

Over the next decade, the NRO will continue to increase the number of satellites, both large and small, operating across multiple orbits.

Later this month, around the 19th, the first phase of our proliferated architecture is scheduled to launch as NROL-146 out of Vandenberg. We have already launched a number of demonstrations over the last few years to verify cost and performance, really to be comfortable and make sure we knew what we were doing. These systems will increase timeliness of access, diversified communication pathways, and enhance our resilience significantly.

For our other ground systems and our on-orbit capabilities, we are strengthening our cyber defense, eliminating single points of failure, and hardening our architecture. This will also enable a much more resilient system going forward.

The NRO has been at the forefront of innovation since our inception, and today that culture of innovation is even more critical. Our highly skilled workforce, including both military and civilians, brings diverse viewpoints and innovative ideas to solve complex intelligence problems.

A critical example is growing our workforce to be able to take full advantage of both AI [artificial intelligence], and machine learning, and automation that is going to be required to operate and deliver capability to the users.

Partnerships are inherent in who we are. Our workforce is a blend of government civilians and members of every military service, primarily the Space Force, but every military service. As we evolve to meet the changing mission needs, we look forward to continued collaboration on personnel support from both our civilian and military partners.

We maximize our partnership when we have colleagues and partners across the intelligence and defense community to leverage every possible innovation to optimize collection tools and effectiveness.

For example, our partnership with U.S. Space Force, and previously the Air Force, on launch procurement has provided assured access to space for the NRO's systems for over 15 years. We are fully committed to NSSL [National Security Space Launch] Phase 3, and have worked very closely with the Space Force to include all the capabilities that we need to execute our mission.

Our continued success depends on our ability to adapt and to innovate faster, not only fast but faster than any of our potential competitors, and on Congress' continued support for our mission. New technology, and new partnerships, and the talents of our workforce are critical to maintaining our competitive advantage in keeping American safe.

On behalf of the entire NRO workforce, I appreciate the opportunity to appear before you here today. Thank you for your time, and I look forward to your questions.

[The prepared statement of Dr. Meink can be found in the Appendix on page 62.]

Mr. LAMBORN. Thank you.

Ms. Wilkerson, you are recognized.

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

Ms. WILKERSON. Good afternoon, distinguished members of the subcommittee.

The National Geospatial-Intelligence Agency is our nation's leading authority for geospatial intelligence, or GEOINT, providing warfighters, policymakers, intelligence professionals, and first responders with the decision advantage they need to carry out national security objectives at home and abroad, from seabed to space.

The GEOINT we deliver, much of which comes from space-based systems, conveys not only what, when, and where events are happening, it also illustrates how they are occurring, the implications, and what is likely to transpire next.

NGA's GEOINT professionals work across more than 100 locations in the United States and around the world. Dual-headed as an intelligence agency and combat support agency, NGA provides GEOINT to the services, combatant commands, and other federal departments and agencies. This includes tasking, analysis, and dissemination of national technical means and commercial imagery, data, and GEOINT analytic services in support of community requirements.

NGA is committed to maximizing efficient and effective use of all available GEOINT sensors, including those that are space-based, enabling collection to be at the right location, at the right time to meet service and combatant command needs.

Obtaining the data used to produce GEOINT is not a simple task. NGA's highly skilled intelligence collection professionals execute a process we call informed collection orchestration to align na-

tional priorities with operational and analytical needs, and real work world deadlines.

NGA's unique ability to carry out informed collection orchestration is not only in statute, policy, and practice, it is rooted in our expertise as leaders in the GEOINT discipline. It is also central to ensuring that our warfighters and intelligence professionals alike receive the imagery and analysis they need, when they need it.

We continue to provide what is needed, when it is needed by integrating with warfighting headquarters around the world to incorporate artificial intelligence through programs like Maven, accelerating their operations and decision speeds. As we move forward with AI, our goal is safe, responsible, and accurate application of its capabilities in a way that augments and enhances our GEOINT workforce.

I would also like to highlight two areas where NGA is leading within the space domain.

First, we maintain detailed physical characterizations of our planet from the ocean floor to space, providing critical data and production of materials necessary for the safe navigation of air, land, and sea.

Second, NGA also leads the way in guaranteeing assured precision and accuracy of GPS, maintaining the World Geodetic System-1984, or WGS-84, reference frame, which is the backbone for all geolocation. This foundational mission complements the important work we do to deliver GEOINT that advances national security priorities.

NGA continues to ensure the security of space because, just as the United States recognizes the critical role of space, so, too, do our global competitors. Our most capable and potential adversaries continue to invest in increasingly threatening counter-space systems, intent on disrupting or denying critical space systems and services that not only support our national security, but also our everyday lives.

NGA remains focused on understanding such capabilities and providing our warfighters and policymakers the information they require to counter and deter threats to our national and commercial assets.

In closing, NGA relies greatly on data obtained from space systems to deliver vital GEOINT that advances national security priorities and the security of space. And we are committed to the partnerships with the United States Space Force, U.S. Space Command, and NRO to ensure that GEOINT plays the broadest role possible in understanding adversaries' space and counter-space threats.

Thank you. And I look forward to answering your questions.

[The prepared statement of Ms. Wilkerson can be found in the Appendix on page 71.]

Mr. LAMBORN. Thank you.

We will now begin our members' questions. We will each have 5 minutes.

I have a question for each one of you, so I will ask for a concise answer.

Dr. Plumb, in your Commercial Space Integration Strategy you talk about the possible need for commercial insurance, commercial

war risk insurance, U.S. Government-provided insurance, and indemnification to be provided for commercial space providers as part of doing business with the U.S. Government.

Can you talk a little bit more about what authorities you think you will need to fully realize this?

Dr. PLUMB. Yes, thank you, Mr. Chairman. Commercial Space Integration Strategy is one of the main pieces that was helping drive some of the writing of this strategy because of a lot of questions from industry on that. And we were trying to lay flat what the actual situation is.

I will say for the air domain and for the maritime domain there is a Government-backed war risk insurance vehicle which is, we know it as CRAF [Civil Reserve Air Fleet]. You have heard of CRAF, perhaps, for the air domain. It is really just for air logistics.

And then there is also the DISA for, D-I-S-A, which is for the maritime. There is no similar statutory authority for the space domain. And the Department is not ready to say that we need that right now. But the Secretary has tasked the Department to go look and say, hey, what would be those conditions where we might need it? And part of, of course, is where would that need to be changed in the statute.

All of those cases, those types of insurance vehicles are only turned on when the Department wants them. They are not a blanket agreement. It is only in specific situations the Department agrees that in this specific case we should use them.

So, I think there is goodness there. And I think we would need Congress' help to do that if that was the direction we would go.

Mr. LAMBORN. Okay, thank you.

Ms. Wilkerson, I wanted to give you a chance to give NGA's perspective when it comes to the future of tasking for GMTI that you talked about earlier. From your vantage point, what policy, documents, or directives do you believe support your position?

Ms. WILKERSON. Thank you for that question. Sir, we look forward to collaborating with our partners within Space Force as well as the NRO in a way that allows for the leveraging of the expertise and skills that are resident in each of our agencies.

We also anticipate that we will be supporting, have a supporting role in the MTI Working Group.

Mr. LAMBORN. Okay, thank you.

Dr. Meink, one issue that we hear a lot about is how much we are taking advantage of the commercial market for space imagery. What steps is the NRO taking to increase the use of commercial imagery, remote sensing to complement, and integrate, and augment with Government systems?

Dr. MEINK. I guess I will break that into two pieces.

The second piece is we are working closely with NGA and the rest of the Department to fully integrate commercial services into an integrated architecture so you can pass them just as effectively as you can pass any of the national systems. So, working closely we made great progress on that.

With respect to incorporating new and additional commercial partners, that has been a big focus of ours. Obviously, we have a large number of contracts with optical commercial providers. We

also have contracts with radar providers, commercial radar, commercial radar providers.

And we have a set investment every year that its sole purpose is to accelerate and work with up-and-coming commercial partners to advance our capability and help guide them on what the IC and DoD need so that as they make their investments we can eventually form more robust partnerships in other than the just the early development cases.

So, we are doing it across the board.

Mr. LAMBORN. Very good. Thank you.

And, finally, Dr. Calvelli, Mr. Calvelli, DoD's commercial space strategy notes the importance of achieving integration with commercial entities prior to conflict, to include planning and training activities.

How would you characterize Space Force's current level of integration with commercial entities?

Mr. CALVELLI. I think today the best investment of that would be launch. We are relying predominantly on the commercial launch infrastructure for launching our, our most stressful missions as well as ones that are less stressful, you know, like more proliferated kind of systems.

We are also using commercial today in some cases for the satellite communications systems. And, and I can envision a future where we are taking advantage of more commercial to do things like more Space Command awareness. And as it evolves and becomes more mature, so does space access for mobility and logistics, on-orbit servicing sort of things as well.

So, I think today, you know, we practice even just the standpoint of, like, the VICTUS NOX demo, where we actually had a commercial flight that actually got our satellite to orbit within about 27 hours from call-up. And I think as we continue to evolve in taking more advantage of the commercial sectors, perhaps you are right, we need to include that as part of our training regimen as well.

Mr. LAMBORN. Very good. Thank you so much.

I will now turn to the ranking member for any questions he might have.

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

I want to follow up on this Title 10 versus Title 50 concern that the chairman and I both raised.

Quick story. The Space Force and INDOPACOM [U.S. Indo-Pacific Command] recently worked with our industry partners to notify warfighters of a CCP [Chinese Communist Party] space launch within 24 hours, and then used commercial imaging capability to image that same satellite within days, all unclassified.

This information was really useful to the Commander of INDOPACOM. Yet, they faced opposition in even doing this exercise. And we hear consistently that the IC is opposed to DoD acquiring commercial imagery directly.

Dr. Plumb, as we have heard, there is an outdated DoD guidance surrounding this issue that was written in the early 2000s. Do you believe that we should take a look at that policy and update it to reflect a new reality?

Dr. PLUMB. Yes.

Mr. MOULTON. Might you elaborate?

Dr. PLUMB. Look, I think, appreciate the question, and I just want to be clear. I truly do believe that despite what you are hearing, we all agree that we need to find a way to make sure that the warfighter gets the information they need in an operation relevant timeline. Without doubt, there is no point in system; that, that is our mission.

I do think what we found in the classification review is that these policies are very old. The classification policies was written before any of the commercial space had really evolved. What you are referring to here, I mean, there is an NSPD, a presidential document, from 2003. There are other things, some classified, some not.

But some of these are legacy. And legacy isn't as long anymore because the commercial innovation has accelerated what is happening in Space Command so quickly.

So, I think it would be incorrect to not go back and look and say, hey, are these things, have the, have the memos and policies evolved with the real situation?

I mean, there was a time when commercial imagery, just as an example, was the thing. People were, like, this is so interesting.

Well, now what the product is in the market is not just the imagery, it is also the analysis of it. And so, that is a different place than we were 20 years ago. I think these need to be looked at.

Mr. MOULTON. Okay. All right.

Dr. Plumb, as I said in my opening statement, I believe we have made profound progress in space over the course of your tenure. I am rather disappointed that you weren't at the hearing yesterday to enjoy my esoteric jokes that as a physics major, a fellow physics major I think you would have appreciated. It would have literally doubled the number of people laughing in the room.

I don't understand why people don't find jokes about hypersonics in Chernobyl so enjoyable.

But in any event, I was wondering if you could just take a minute to reflect on your tenure and think about what are some of your most proud achievements? What are some of the most significant areas where we have been able to make progress, or you have been able to make progress?

Dr. PLUMB. First of all, thank you for that opening to the question.

You know, the four C's that I -- we started with three C's from the day I got here, and then we ended up with four because commercial is so important that we had to add that really to my priority list.

I think we have made a lot of progress on all of those. But fundamentally, the thing that I think has driven this is trying to be truly collaborative across the national enterprise with the IC [intelligence community], with the services, with the White House, with the State Department, with the Congress as well, and also with the bipartisan approach here.

I think in the past folks have used classification to keep people out of decisions. And that tends to backfire. So, I feel like having that collaborative approach has brought folks along together and we have been able to iron out things early and really make progress.

Our focus on China has helped us make progress as well, sir. Nothing like having something to really focus the mind to say we need to get, we need to get ready. That is probably the biggest thing.

Going forward, tremendous facility for implementation. And I would just say conflict is not inevitable. I have said this many times. It is not inevitable. If we do our job right, it will not happen. Right? Deterrence is the goal. But we do have to be ready.

Mr. MOULTON. Well, thank you again for your service.

Mr. Calvelli, the 2018 NDAA [National Defense Authorization Act] gave authority to the Commander of Space Systems Command to maintain a watch list of contractors with a history of poor performance on space contracts. I am just curious, how useful has this been?

Is it a tool that we could expand?

Mr. CALVELLI. It has been, it has been useful. I think it can be more useful.

I would love to see the tool expanded and given the authority to me as the service acquisition executive to go and use the crawl across all the space acquisition enterprise that are underneath my, my control.

Right now it is only at SSC, under the control of the SSC commander.

Mr. MOULTON. Are there other authorities like that that would help you better, better maintain control over these contracts?

Mr. CALVELLI. I think that is a key one to get. And I think starting with that would be ideal.

Mr. MOULTON. Okay. Great.

Thank you, Mr. Chairman. I yield back.

Mr. LAMBORN. Mr. Turner.

Mr. TURNER. Thank you, Mr. Chairman.

Dr. Plumb, I, too, want to join the chorus of those who thank you for your public service, and certainly wish you well. I am certain that we will be seeing you in other capacities. And we all look forward to that.

Dr. Plumb, on page 4 of your written testimony it states, "Russia is also developing a concerning anti-satellite capability related to a new satellite carrying a nuclear device that Russia is developing. This capacity could pose a threat to all satellites operated by countries and companies around the globe, as well as to the vital communications, scientific, meteorological, agricultural, commercial, and national security services we all depend upon."

Dr. Plumb, this is the first time that the Administration has approved anyone in an open unclassified session making that statement. Just yesterday Secretary Austin was asked this question, and he deferred and requested that the conversation only occur in a classified setting.

So, this is significant that you have made this statement. I am assuming the White House has approved your statement today?

Dr. PLUMB. Congressman, the statement, I would say the National Security Advisor has made similar comments in the last few days. And it is on the, I believe it is on the WhiteHouse.gov website. But he has made them and we can get those to you as well.

Mr. TURNER. But in a congressional open --

Dr. PLUMB. This is, of course, a congressional one.

Mr. TURNER. -- unclassified statement this is the first time that anyone has said that?

Dr. PLUMB. I think that is right, sir. And I do think that is right it falls to me. But, yes, sir.

Mr. TURNER. Well, thank you for making it because you both characterize the issue and the threat as incredibly significant.

I want to talk to you a little bit about the issue of developing. You say that they are developing a concerning anti-satellite capability.

You, first-off, acknowledge it is a satellite. So, this is something that is going to be in orbit. Will this be in low-Earth orbit, ge-orbit? Where is this intended that it would be located?

Dr. PLUMB. Sir, a lot of this gets classified based on intel sources. So, at the moment I think that is as far as I can say.

But, right, the concept that we are concerned about is Russia developing, and if we are unable to convince them otherwise, to ultimately fly a nuclear weapon in space, which would be an indiscriminate weapon: doesn't have national boundaries, doesn't determine between military satellites, civilian satellites, or commercial satellites.

Mr. TURNER. So, Dr. Plumb, you say "developing." Is this conceptual, something that they put on a napkin somewhere?

Is this they have developed a warhead, they have developed a satellite, they have married them together? When you say "developed," what is the current risk for a threat? Is this something that could be -- let's start with this. Is this something that could be launched now?

Dr. PLUMB. And here is where you have me, again, at a disadvantage. I would be happy to have this conversation in a classified session.

If we don't have one after today, as I know you are constrained for votes, I would be happy to come back in my remaining tenure and have a one-on-one conversation with you, sir.

Mr. TURNER. Is it an imminent threat?

Dr. PLUMB. It is not imminent in the way that we should have to worry about it right now. But we are concerned about it at the Department and the entire Administration. And I know this Congress is taking this deadly seriously.

And we are, as you know, we have just had that United Nation's Security Council resolution that Russia vetoed, which may in fact tip their hand on this, that really just reaffirmed not placing nuclear weapons in outer space, which Russia and the United States and all space-faring nations have already signed up not to do. So, this is a concern for us.

Mr. TURNER. Dr. Plumb, let's go to, then, what the effects would be.

Dr. PLUMB. Sure.

Mr. TURNER. The Secretary testified that it would be devastating.

You list, you know, scientific, meteorological, agricultural, commercial, national security. Tell us some of the things that would be

the outcome if this anti-satellite that carries a nuclear payload was used in orbit?

Dr. PLUMB. Yes, sir.

First of all, you know, just to be clear, modeling on this needs to be conducted, you have to know the specifics of how a thing would be used, what type of a detonation it might be. Where it might be detonated changes the outcome as well.

Some of this modeling probably could be more robust. But, roughly, in lower orbit in particular, but roughly satellites that aren't hardened against nuclear detonation in space, which is most satellites, could be damaged and affected.

And some would be caught in the immediate blast which, you know, they would not be able to survive the flux of that. And then others could be damaged over time by going through there is a dip over the Van Allen Belt over the South Atlantic, and if those Van Allen Belts are pumped, then radiation damage to satellites would just naturally occur over time.

Mr. TURNER. Dr. Plumb, my time is expiring.

Dr. PLUMB. I am sorry, sir. Yes.

Mr. TURNER. Would this render the area of the detonation unusable for a period of time?

Dr. PLUMB. So, several analysts do believe that a detonation in space of the right magnitude in the right location could render a low-Earth orbit, for example, unusable for some period of time.

And this was an example that we did in the Sixties.

Mr. TURNER. Dr. Plumb, if you might, can you, can you give us some perspective? You said for a period of time?

Dr. PLUMB. I would just, well, again, I don't have those numbers in front of me. I would just say in the Sixties the United States detonated a nuclear weapon in space.

Mr. TURNER. Right.

Dr. PLUMB. Unclassified, Starfish Prime. And that really rendered the orbits unusable for some period.

Mr. TURNER. Could it be a year?

Dr. PLUMB. I believe it could. Yes, sir.

Mr. TURNER. Thank you. I yield back.

Mr. LAMBORN. Mr. Garamendi.

Mr. Carbajal.

Mr. CARBAJAL. Thank you. Thank you, Mr. Chair. And thank you, Mr. Garamendi, for your generously yielding to me.

I want to thank you, Dr. Plumb, for your many service, many years of service to our country. And I wish you the best in whatever you pursue next. Certainly I hope it is staying in touch with the Federal Government in some way or another.

Innovation and competition from the commercial industry have lowered the cost of space launch for the U.S. Government and private industry by a factor of four, saving the DoD [Department of Defense] tens of billions.

In my district at Vandenberg Space Force Base I have seen how decreased costs for space access drives investment and innovation that greatly increases our nation's launch capacity. Vandenberg had only four launches in 2012, but may have as many as 50 this year alone, a significant development for the Department and the U.S. industrial base.

Mr. Calvelli, can you discuss how lower launch costs brought by commercial innovation and competition in the National Security Space Launch Program have changed our national security posture, including enabling the deployment of proliferated resilient constellations, a significant national security capability that was only feasible a decade ago, from the launch cost or capacity perspective? That wasn't feasible.

Mr. CALVELLI. I tell you, sir, lowering the lower cost of launch has been a game changer for us all. It has dramatically improved our ability to build smaller satellites, to launch them quicker, to build proliferated constellations. It has really become sort of an amazing enabler for not only national security's launch but also for what we are seeing is a proliferation of commercial space companies now.

We are seeing companies being able to actually launch cost-effective satellites. So, we are seeing universities building satellites and CubeSats. We are seeing a whole generation of young folks starting companies to go off and do serving in space and to do space missions. People looking at building, you know, commercial habitats in space. It is amazing.

But a lot, all this is driven and enabled by the lower cost of launch.

Mr. CARBAJAL. Thank you. Proliferated LEO [low-earth orbit] constellations have made services available that used to require very expensive, exquisite, oftentimes large satellites. Our domestic Earth observation industry can provide imaging faster and cheaper than ever before, which is why I am supportive of the Space Force Tactical Surveillance, Reconnaissance, and Tracking Program.

This capability provides tremendous benefit for our combatant command who have asked for this ability.

Mr. Calvelli, can you walk me through how the recent demo conducted by the Space Force and INDOPACOM demonstrates how valuable this capability could be to the Department of Defense?

Mr. CALVELLI. Yes, sir.

We are off doing a pilot program right now out of Space Systems Command, and it is going extremely well. And there we are just very fortunate that the commercial industry has taken off in terms of commercial analytics that use space sensing as well as a variety of other sources to, to gather information, and be able to do rudimentary things that we are able to provide to the commands in a timely manner.

So, we have invested some dollars in it. Last year we got some dollars; heading into next year as well. And we continue on with the pilot. And look forward to reporting back how that pilot goes.

Mr. CARBAJAL. Thank you. Some argue against the Space Force moving forward with its program at scale because there could be duplication with the IC on what is being bought from the industry, that the Government could be paying for the same data twice.

Mr. Calvelli, do you believe that concern, that concern could be overcome by the appropriate policies and structure, guided by recent commercial space strategies?

Mr. CALVELLI. It could be done in policy structure. But I will tell you that I, I have asked my folks at the working level, and they

say that they have enjoined and they work cooperatively with the NRO and with NGA to make sure there is no duplication going on.

So, across the working level the teams are actually doing great and making sure we don't have any duplication.

So, I am very proud the intelligence community and the Department of Defense for working together on this.

Mr. CARBAJAL. Thank you.

Mr. Plumb, China and Russia are investing in their space programs and making advancements. Do you think that fiscal year 2025 budget request for our National Security Space Program is adequate to maintain space superiority? And what happens if we fall behind in our space capabilities?

Dr. PLUMB. Well, I mean, sir, first of all, first of all I do think it is adequate. I think, obviously, anyone in the Department will always prefer to have additional money to put against additional problem sets. And the Fiscal Restraint Act or Responsibility Act does put some budget pressure on us as we look at this.

The one thing I will say as we look at the Space Force, if we are looking at what can we do in the next 2 years to get ready for, you know, a potential Taiwan problem set, that really has some problems with Space Force in particular as kind of a new service.

It sort of eats seed corn that you can't also think about the 2030s. And that is a tradeoff we wrestle with every budget. But I think the Space Force may be more impacted than others.

Mr. CARBAJAL. Thank you, Mr. Chairman. I am out of time. I yield back.

Mr. LAMBORN. Thank you. Mr. DesJarlais.

Dr. DESJARLAIS. Thank you.

Mr. Calvelli, the Phase III Acquisition Strategy for the National Security Space Launch Program allows the Space Force to select up to three providers for its Lane 2 missions. As I am sure you are aware, there has been some talk in the media about consolidation in the launch sector.

If it ultimately comes to fruition, how would this consolidation impact your Acquisition Strategy for Phase III?

Mr. CALVELLI. So, the Phase III Acq. Strategy won't change. The Phase III Acq. Strategy proposals are in-house and we are working through them right now. So, that's pretty much set in stone.

I really like the Phase III Strategy. If you think about our history, we were under a monopoly in terms of a single company for launch for decades. And the Air Force, and now the Space Force, to their credit have done a magnificent job of cultivating a second provider.

And I think as a nation, one of the best things we possibly could do is cultivate a third provider as well to launch our most stressful missions.

On top of that, the Lane 1 is the more commercial-like missions where we are allowing anybody to on-ramp onto that, who brings the rocket. And that has demonstrated a test, a flight.

And so, I am very optimistic with the strategy that we put together. I don't see that changing. Mergers and acquisitions happens all the time in industry. We will see what happens over time. And if any consolidation occurs, we will have to adjust it then.

Dr. DESJARLAIS. One concern is that we are trying to chart out this strategy for the next 10 years, and we are trying to increase its launch cadence every year. It is imperative if we get it right.

Can you confidently project a 10-year strategy to deter China?

Mr. CALVELLI. So, it is really a, the launch strategy is really a 5-year strategy; right? Lane 2 is a 5-year strategy. Lane 1 is a 5-year strategy with five 1-year options. And so, we always have the opportunity to adjust the concept at any point in time.

Dr. DESJARLAIS. Okay. I am curious to know if you are planning on maintaining block buys in future procurements. Certainly this would help maintain healthy supply chains here in the U.S. But I am interested in understanding how you all are assessing this idea?

Mr. CALVELLI. Yeah. The team does a really great job in terms of looking out into the future and understanding and doing what they call their mission allocation process. And so, we end up doing, you know, block buys as part of Phase II. And I don't see that changing as part of Lane 2 for Phase III.

Dr. DESJARLAIS. So, staying on the issue of how we can best leverage the ever-evolving space industry, and, Dr. Plumb, I would like to get you in here in addition to Secretary Calvelli, again I think that the Department is largely doing a great job leveraging innovation in the private industry to meet national security objectives in the space domain.

However, a key hindrance to this effort has been the cumbersome FAA [Federal Aviation Administration] permitting process for launch and reentry licenses.

How are you working with the FAA and the industry to improve efficiency in the review and approval process?

Dr. PLUMB. Thank you, sir.

I would say that the Department does need the FAA to move, you know, sometimes more quickly. I do think they have some funding challenges. I have recently been involved personally in some conversations with them.

I think the Department generally supports efforts to help the FAA be able to have enough resources to get this right.

Dr. DESJARLAIS. Anything to add?

Mr. CALVELLI. Just like we mentioned earlier about, you know, it is always great to look at policies and directives and update them, I am sure that, you know, the current regulations that were put in place didn't anticipate what an amazing space enterprise we were going to have, and space economy for the country.

And I think that both Congress and the Executive Branch need to work together to make sure that we have the most efficient and effective regulations and policies in place to continue to allow commercial industry to innovate and take advantage of launch and take advantage of space, as opposed to being held back.

Dr. DESJARLAIS. All right, thank you. I yield back.

Mr. LAMBORN. Thank you.

Mr. Norcross.

Mr. NORCROSS. Thank you, Chairman. I would like to thank all the witnesses for being here today. And certainly, Dr. Plumb, we appreciate everything you have done and, more importantly, what you will continue to do.

I want to drill down a little bit further on the conversation that Mr. Turner started, and the conversation we have when we start talking about the recent U.N. Security Resolution that was vetoed by Russia.

But you mentioned an item that brings up the Outer Space Treaty, early Sixties sometimes, or maybe it was the late Sixties sign-on, too, that talks about weaponization in space. More specifically, I think it talked about mass destruction. Could you brief us quickly on that?

Dr. PLUMB. Yes, sir. It is pretty straightforward, actually, at least for satellites in orbit around the Earth. Basically says that countries agree not to place nuclear weapons or any other weapons of mass destruction in orbit around the Earth. And so, the fact that Russia vetoed the resolution reaffirming a commitment they have already made is concerning.

Mr. NORCROSS. The reason I bring that up is the term "mass destruction." Because when we look at what is going on outside of what was recently reported, have the Russians and Chinese always, have they already militarized and weaponized space?

Dr. PLUMB. So, if I may, I think you are asking, what you are asking is a slightly different question --

Mr. NORCROSS. Exactly.

Dr. PLUMB. -- because the Outer Space Treaty does not preclude military weapons in space, it precludes weapons of mass destruction in space, and it specifically calls out nuclear weapons, just to eliminate any confusion.

But if the question is are Russia and China weaponizing space or militarizing space? Absolutely. Absolutely. They are developing, and fielding, and deploying a number of counter-space weapons. Some are ground-based but some are on-orbit.

And I think that, personally, personally think that that is what makes their kind of continuing championing at the U.N. their PPWT, which is about not placing weapons on orbit, to be so hypocritical and, frankly, unbelievable.

You know, at the unclassified level we can say that Russia is deploying and developing prototype kinetic weapons in space.

We can say that China has developed robotic satellites that are really, probably, dual-use. They could be used for non-military purposes but they can clearly also be used for military purposes like grappling a satellite. And in a classified session we can go deeper.

But I do think that their proposal at the U.N. just continues to be both unbelievable, unverifiable, and really hypocritical based on what they are actually doing.

Mr. NORCROSS. Exactly the point I am trying to make. There are weapons in space, mass destruction, crossing every threshold, particularly with the nuclear side of that equation.

When we look forward to what is coming in space and, quite frankly, potentially could happen, our nuclear command and control, and this would be delicate in this environment, in the event that space were to be blocked, mass destruction somewhere else, what would cause us any concerns for nuclear command and control? Space got wiped out, do we still have a way of addressing those issues?

Dr. PLUMB. So, I will just say any good military plan requires both your primary, your alternate, your contingency and emergency plan for communications. We do rely heavily on space for all military missions, but we do need to have plans for contingency.

Mr. NORCROSS. Right. But as we look forward, and this is where I am going with this line of questioning, in addition to the command and control, putting that aside to be addressed, our eyes would be put out?

Dr. PLUMB. Yes, sir.

Mr. NORCROSS. And that is a major concern because then we won't necessarily know until some other forum would let us know that there was an attack?

Dr. PLUMB. Yeah, I think this is where -- this, this line of conversation is the type of conversation that needs to be held with potential adversaries, right, with Russia, with China. That is why we have routinely said that attacks on our nuclear plan and control system, including our overhead eyes, you know, overhead persistent infrared, is, is a prelude to attack, is a concern. Right? If you are doing this, why are you doing this outside of getting ready to attack in some blindness?

And so, these are, they should be off limits things to prevent escalation in the worst case to a nuclear war.

Mr. NORCROSS. Exactly my point. Thank you.

And I yield back.

Mr. LAMBORN. Mr. Strong.

Mr. STRONG. Thank you, Chairman Lamborn, Ranking Member Moulton. Mr. Calvelli, thank you for being here today.

You may have heard a few weeks ago I co-lead a bipartisan letter in support of the National Security Space Launch Program with Ranking Member Moulton which supported several member -- which is supported by several members of the House Defense Committee.

I would like to commend the Department for its steps taken to encourage competition within Phase III of the NSSL program, specifically the dual lane approach which provides separate launch opportunities for new entrants and experienced national security launch providers.

However, I do have concerns about Lane I. What guardrails does Phase III have to keep any providers, particularly our experienced providers, with high launch cadences, from underbidding Lane I launches intended for the new entrants trying to cut their teeth?

Mr. CALVELLI. You know, it is all going to depend on what the payload is and the mission. And, I mean, the key to entry into Lane 1 is the ability to actually have launch of the rocket.

I think I understand your point. And I will have to take that back to think more through about that.

Mr. STRONG. Thank you.

To be clear, there is nothing official within the Phase III strategy to ensure that smaller new providers are benefitting from Lane 1 as intended. Is that, is that a fair assessment?

Mr. CALVELLI. I think it all depends on the size of the payroll. If you are launching, you know, just a couple of small sats, it is going to be more cost effective to go on a small provider than it is

going to be on a more traditional rocket. Just it is going to cost you a lot less.

Mr. STRONG. I understand the point you are trying to make. But if the Department is truly committed to the dual lane approach and encouraging new providers to work with the Space Force, I would personally like to see something a bit more concrete to protect this.

Mr. Calvelli, how confident are you that the Space Force's plan for missile warning and tracking capabilities meets requirements to provide full operational capability within the necessary time frame?

Mr. CALVELLI. Well, I am very confident. We have got a great architecture already on orbit today with the Space-Based Infrared System. So, we are flying vehicles with that today. Those are operational on-orbit and doing great things.

We have their replacements coming through what is called the Next Gen GEO Program that is continuing to make progress. And we will see a launch of that in the 2025-2026 time frame.

But we have some challenges making sure that the mission payload gets delivered. It is about a year late. And we are tracking that really closely. It should arrive this summer for integration into the satellite and for launch at the end of 2025, early 2026.

On top of that, we also have pivoted a couple of years back to start developing a proliferated LEO constellation and a proliferated MEO [medium-earth orbit] constellation at Medium Earth Orbit. Both those constellations add a new capability.

The ones in orbit say only the missile warning. These are now, these systems, the MEO and LEO, will do missile tracking. So, they will warn you and they will track the missile, which would be ideal for advanced weapons systems like hypersonics.

Mr. STRONG. That is exactly why I, you know, asked that question. I know you submitted a statement, you highlighted a concern with the delivery of the timeline for next generation GEO. And I appreciate that, that answer.

Mr. Chairman, I yield back.

Mr. LAMBORN. Thank you.

And I see we are 5 minutes left on the clock over on the voting in the chamber. But I am going to let Garamendi, Mr. Garamendi ask any questions he wants to.

Mr. GARAMENDI. Mr. Norcross and I developed an additional question.

Was the 1960 nuclear explosion by the United States information classified?

Dr. PLUMB. No. You can, you can look it up online, sir.

Mr. GARAMENDI. What did we learn from that?

Dr. PLUMB. Well, obviously it was a different time. And, of course, we were doing nuclear tests and things.

But I think what we learned, if I have my history right, is that it did significant damage to all the satellites that were in those orbits. And some failed soon, but some failed over time and was attributed to that explosion.

Mr. GARAMENDI. Thank you. I am going to just pose the question then come back to you in writing because we are out of time here. And this is for Dr. Plumb and Mr. Calvelli. Commander of U.S. Space Command cited space domain awareness as the Com-

mand's top priority. Among the escalating threats from China and Russia, part of what was discussed just a moment ago, do we have the ability to be aware? And if not, what do we need to do to be aware at this phase?

If you can come back to us in writing.

[The information referred to can be found in the Appendix on page 79.]

Mr. GARAMENDI. Other than that, our careers will be terminated if we miss our votes. So, we had best be on our way. Thank you very much.

Mr. LAMBORN. Thank you, Representative.

I want to thank all the witnesses for testifying. I thank the members for participating. I thank the audience for their interest.

And we are now adjourned.

[Whereupon, at 4:31 p.m., the subcommittee was adjourned.]

A P P E N D I X

MAY 1, 2024

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MAY 1, 2024

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 2025 NATIONAL SECURITY SPACE PROGRAMS
MAY 1, 2024

Introduction

Chairman Lamborn, Ranking Member Moulton, and distinguished members of the subcommittee: Thank you for inviting me to testify before you on the Department's Fiscal Year (FY) 2025 space budget. I am honored to appear alongside Assistant Secretary Calvelli, Dr. Meink, and Ms. Wilkerson. Today will be the last time I have the opportunity to appear before you as the Assistant Secretary of Defense for Space Policy, as I will be departing my position in mid-May. I would like to take the opportunity to express my sincere gratitude to this subcommittee for its bipartisan approach to our national security space posture. I have truly enjoyed working with this subcommittee, and I appreciate what we have accomplished together.

We are clearly in a time of rapid change in the space strategic environment, one which does not favor the slow or those resistant to change. As we evaluate our current security environment, both the People's Republic of China (PRC) and Russia are focused on rapidly fielding space and counterspace capabilities to hold the Joint Force at risk and deny us the space-based services on which our Joint Force relies. The President's space budget request of \$33.7 billion for Fiscal Year (FY) 2025 will advance a wide array of critical space capabilities, including \$25.2 billion in investments for procurement and research, development, test, and evaluation. These investments will help protect the Joint Force and ensure our ability to operate in a contested and congested environment.

FY 2025 Space Budget Request

The President's FY 2025 budget request of \$33.7 billion for space strikes a balance among current warfighting needs, modernizing our architecture, and developing new capabilities to outpace our potential adversaries. This request includes approximately \$8.5 billion for military

construction, military personnel, and funding for operations and maintenance. The budget request also identifies \$25.2 billion in critical investments in resilient architectures, space command and control, integrated space fires and protection capabilities, modernized and agile electronic warfare architecture, enhanced battlespace awareness and space systems defense, and a range of capabilities designed to enhance our space control. Important investments for the Department include:

- \$2.4 billion for National Security Space Launch, which will procure 11 launch vehicles to provide assured access to space and to modernize space launch range upgrades to support increased commercial use.
- \$1.5 billion for more resilient positioning, navigation, and timing (PNT) for GPS III Follow-On satellite support, including two GPS III follow-on satellites, and Next-Generation Operational Control System (OCX) development.
- \$4.2 billion for a resilient protected tactical, wideband, and narrowband communications architecture and the Space Development Agency's proliferated Low Earth Orbit (pLEO) transport layer development.
- \$4.7 billion to develop new proliferated Resilient Missile Warning / Missile Tracking architectures, Next-Gen Overhead Persistent Infrared (OPIR) space and associated ground architectures.
- \$12.3 billion for a range of capabilities to increase resilience of existing architectures and to enable us to protect our space interests during competition, crisis, and conflict.

While the depth and breadth of space threats continues to rapidly expand, we can only meet these challenges through strong and sustained investments in our space capabilities. The Department cannot operate effectively or efficiently under repeated continuing resolutions. I urge Congress to ensure the timely passage of appropriations for FY 2025.

Security Environment

People's Republic of China (PRC)

According to the Office of the Director of National Intelligence's (ODNI) 2024 Annual Threat Assessment (ATA), China will probably have achieved "world-class status in all but a few space technology areas" by 2030. The PRC views the space domain, and the ability to deny space to PRC adversaries, as a critical component of modern warfare. The PRC has made significant investments in space capabilities to rapidly expand its ability to monitor forces across the globe and improve its long-range precision strike capabilities against U.S. or allied forces to deter or deny outside regional intervention. To advance its concept of "informatized" warfare, the PRC continues to develop and modernize space capabilities to conduct intelligence, surveillance, and reconnaissance (ISR) and to enhance communication, data relays, and positioning, navigation, and timing for its forces. The PRC also continues to rapidly develop counter-space capabilities to hold our on-orbit assets at risk. These capabilities include electronic warfare, direct-ascent anti-satellite missiles, directed-energy systems such as ground-based lasers, potential space-based kinetic weapons, and orbiting space robots. To support its increased investment in space, the PRC is modernizing its launch capabilities and capacity to reconstitute its space capabilities if needed.

Russia

Russia is seeking to mitigate U.S. space capabilities by developing a range of offensive counterspace capabilities, including electronic warfare, directed energy weapons, direct-ascent anti-satellite systems, and orbital systems with counterspace applications. Russia's investments in counterspace systems are designed to exploit what it views as a U.S. overreliance on space for conducting military operations and to offset perceived U.S. military advantages. As noted in the ODNI 2024 ATA, Russia will be more reliant on counterspace capabilities as it rebuilds its ground force from extensive losses in its war against Ukraine. Russian military doctrine embraces multi-domain attacks, using both reversible and irreversible capabilities, to target adversary satellites. Russia has conducted cyber intrusions against commercial satellite communication networks, and Russia has demonstrated through both public statements and actions that it views commercial satellites providing space-based services to Russia's adversaries as potential targets. Russia is also developing a concerning anti-satellite capability related to a new satellite carrying a nuclear device that Russia is developing. This capability could pose a threat to all satellites operated by countries and companies around the globe, as well as to the vital communications, scientific, meteorological, agricultural, commercial, and national security services we all depend upon.

Democratic People's Republic of Korea (DPRK)

The DPRK is a persistent threat and source of continuing provocations to both the United States and our allies and partners. The DPRK continues to pursue its space program, conducting several reconnaissance satellite launch attempts over the last year in violation of multiple UN Security Council resolutions related to DPRK use of ballistic missile technology, and

maintaining previously demonstrated non-kinetic counterspace capabilities, including jamming communications and Global Positioning System (GPS) signals.

Iran

Iran is continuing to develop its space program, and this year it used Russian launch services to place communications and navigation satellites into orbit. Iran has publicly acknowledged its capabilities to jam space-based communications and GPS signals, and its continued development of space launch vehicles (SLV), such as the Simorgh, would shorten the timeline to produce an intercontinental ballistic missile, if it decided to develop one, because the systems use similar technologies.

Growing Use of Commercial Space Services

The advantages of space-based services are no longer exclusive to space-faring nations. Many space services are now commodities; for instance, satellite communication and readily available, highly detailed satellite imagery can be procured by nascent space-faring nations and non-state actors armed groups. While the Department greatly benefits from the innovation of our commercial space sector, we also recognize that our adversaries and competitors will seek to exploit satellite imagery, data, communications, and other commoditized services through illicit means or through commercial entities and avenues outside of U.S. regulatory regimes.

Space Strategy and Policy Investments

The space domain is critical to U.S. national security and essential to all four of our National Defense Strategy's top priorities. Our Joint Force relies on space-based services every day to conduct operations and to protect the Joint Force from space-enabled attack. Together with our allies and partners, space supports our ability to deter a potential conflict and to prevail if deterrence fails.

Our competitors recognize the importance of space to the United States, and they continue to develop and field capabilities designed to deprive us of the advantages of space during conflict.

Over the last two years, in partnership with Congress, the Department has made significant progress on four key space strategy and policy priorities: Space Control, Space Cooperation, Space Classification, and Commercial Space Integration. To maintain our advantage in space, the Department will continue to press on these four priorities.

Space Control

In 2022, at the request of the President's national security advisor, the Department worked with the Intelligence Community to conduct the Space Strategic Review (SSR). This extensive effort baselined the entire national security space community on our overall space posture and where we need to head. Our analysis confirmed that China is the Department's pacing challenge in the space domain, and that space is in fact an operational domain where we must defend our national security interests and counter space-enabled threats. In June 2023, the President approved the Space Security Guidance, affirming the SSR's recommendations.

As we implement that guidance, our primary means of deterring in space will be through resilience. The Department continues to adopt resilient-by-design architectures through a range of approaches that includes disaggregation, distribution, diversification, proliferation, and protection. One way we are increasing the resilience of our space capabilities is through the Space Development Agency's proliferated satellite architecture. In April 2023, the Department launched the first 10 satellites of the Proliferated Warfighter Space Architecture, followed by an additional 13 satellites five months later. This was accomplished in less than three years from contract award to launch, an accelerated timeline made possible by leveraging commercial satellite bus lines and existing technologies. This architecture will enhance and support no-fail missions such as networked communications, missile warning, missile tracking, and missile defense.

But resilience alone is insufficient to provide mission assurance or to deny adversaries' uncontested use of space in conflict. The Space Security Guidance made it clear that the United States will protect and defend our men and women in harm's way from space-enabled threats, just as we do for threats from land, sea, or air. This may require the Department to take action to ensure that our potential adversaries are unable to rely on their space systems to find and strike U.S. and allied forces. As part of the U.S. Government's integrated deterrence strategy, the United States may leverage counterspace options across all operational domains if necessary. In doing so the Department will continue to be a leader in the responsible use of space to ensure that the domain remains safe, stable, secure, and sustainable.

The Department continues to advance our Tactically Responsive Space capabilities to support integrated deterrence and warfighting needs. Last September, the Victus Nox mission successfully launched, with 24-hour notice, showcasing our ability to rapidly respond to

emerging situations as well as highlighting the benefits of leveraging commercial systems, capabilities, and services. A new tactically responsive space mission, Victus Haze, will exercise a realistic threat response scenario in an on-orbit space domain awareness demonstration. That launch is planned for late-2025.

In developing and, if necessary, using our capabilities to protect the Joint Force, we will ensure that space is safe, stable, secure, and sustainable so that everyone may benefit from using space for peaceful purposes. We don't make that commitment lightly. The Department is leading by example and adheres to the Secretary's Tenets of Responsible Behavior in Space, which includes minimizing debris and operating in a professional manner.

The Department also supports this Administration's work to advance national security norms in space through the United Nations, including our commitment not to conduct destructive, direct-ascent anti-satellite (ASAT) missile testing. We supported the U.S.-Japan UN Security Council resolution, which would have reaffirmed the obligation not to place in orbit around the Earth any objects carrying nuclear weapons, or any other kinds of weapons of mass destruction. Concerningly, Russia vetoed that resolution.

Our approach is in stark contrast to the behavior of our competitors. In the past 20 years, both Russia and China have irresponsibly and destructively conducted debris-generating tests. And even while both countries continue to develop, test, and deploy weapons on-orbit, they simultaneously promote hollow, unverifiable treaties at the UN against the weaponization of space. These actions are cynical political ploys by the same nations that refuse to join dozens of others in committing to an actual norm of responsible behavior: to not conduct destructive direct-ascent anti-satellite missile tests. No one wins if space is overrun by hazardous debris. We

continue to call on our competitors to demonstrate their commitment to preserve space as a safe domain.

Space Cooperation

The U.S. network of allies and partners is an asymmetric advantage that our competitors can never hope to match. Through space cooperation with our allies, we broaden the number of systems collectively available for space operations, both on orbit and on the ground; strengthen resilience; expand our options for diplomatic and military responses; and complicate an adversary's decision making. The Combined Space Operations (CSpO) Initiative, a group of defense representatives from likeminded nations, continues to be the premier forum for civilian and military space leadership to work towards shared goals. In December 2023, the CSpO Initiative Principals Board welcomed representatives from Italy, Japan, and Norway as new members of the body, joining representatives from Australia, Canada, France, Germany, New Zealand, the United Kingdom, and the United States.

The Department is also investing in bilateral space cooperation around the globe. Last year my team conducted the first bilateral space cooperation dialogue with the Indian Ministry of Defense. We advanced discussions with our Japanese partners on finalizing our unique space domain awareness hosted payload partnership. U.S.-Norway collaboration enabled the integration of U.S. payloads on two Norwegian satellites to provide 24/7 protected satellite communications for forces operating in the Arctic. The Department has been, and will continue to be, committed to expanding space cooperation to enhance information sharing, set standards for interoperability, promote responsible behavior, and develop combined operations in space.

But space cooperation is not only about working with allies and partners. It is also an important tool we use with our competitors to navigate challenging issues, avoid misunderstandings, and maintain stability. Since President Biden's summit with President Xi last year, my team has been part of several lower-level bilateral exchanges with their Chinese counterparts on space security. Both the United States and China have a vested interest in a safe, secure, stable, and sustainable space domain, and both sides will benefit from continuing to talk.

Space Classification

Our ability to work closely with allies and partners in the space domain, and our ability to use our space capabilities to protect and defend the Joint Force, requires the right information getting to the warfighter at operationally relevant speeds. But that information flow continues to be significantly hampered by the overclassification of space activities.

My office has led the charge to fix this. In coordination with the Intelligence Community, we spent more than a year completely rewriting a 20-year-old legacy space classification policy, which reflected priorities of a different time and a different security environment. That legacy policy limited our ability to share information within the Department, limited our ability to cooperate with our allies and partners, and limited the ability of our industry partners to provide cost effective and timely solutions to difficult problems. Ultimately, it limited our ability to adequately plan and train for conflict.

In December 2023, Deputy Secretary Hicks approved our entirely new space classification policy. Across the Pentagon, there is now a concerted effort to decrease the siloed nature of space activities. The Military Services are reviewing programs to reduce their classification to a level that benefits the warfighter. And we are leaning forward on how much

we can share with our allies and partners, including industry, to allow more meaningful cooperation.

Our goal is to enable better integration of space in joint and combined operations, and to ensure that classified capabilities are accounted for in war plans and exercises. Over time, the new policy should dramatically improve information flow and reduce the time and money required to build future systems.

Commercial Space Integration

Just last month, in April 2024, the Department released its first-ever Commercial Space Integration Strategy. Shortly after, the U.S. Space Force released a service-level strategy, nested under the broader DoD document. This marks a new effort to harness the remarkable innovation of the commercial space sector to enhance our resilience and strengthen integrated deterrence.

To protect our men and women in uniform and ensure the space services they rely on will be available when needed, the Department has a responsibility to leverage all tools available. That includes commercial solutions.

From more mature capabilities such as launch, space domain awareness, and satellite communications, to emerging capabilities such as on-orbit mobility and logistics, the commercial sector's ability to innovate, scale production, and rapidly refresh their technology is opening the door to all kinds of possibilities.

Our National Defense Strategy directed the Department to increase collaboration with the commercial space sector and leverage its technological advancement and entrepreneurial spirit. This new strategy follows through on that directive.

The degree to which commercial space capabilities and services can benefit U.S. national security will ultimately be measured by how well the Department can actually integrate commercial solutions into the way we operate, not just in peacetime, but also in conflict. To accomplish this, as Secretary Austin wrote in the forward to the strategy, the Department needs “to eliminate the structural, procedural, and cultural barriers to overcoming legacy practices and preconceived notions of how the commercial sector can support national security.”

Over the last year, my team engaged directly with space stakeholders across the Department, with interagency partners, and with commercial space entities of all sizes. We hosted roundtables, tabletop exercises, and informational sessions to better understand how commercial space solutions could support the Department, while taking into account the commercial sector’s interests as well. Informed by that body of work, our new strategy directs the Department to pursue four lines of effort for commercial space integration: (1) ensure access to commercial space solutions across the spectrum of conflict; (2) work to achieve integration prior to crisis; (3) establish the security conditions necessary to integrate commercial space solutions and help commercial providers reduce risk; and (4) support the development of new commercial space capabilities that have the potential to support the Joint Force.

This is an important new effort to leverage American ingenuity to enhance the resilience of our national security space architecture and to strengthen deterrence, and I am confident it will pay dividends for the Department for years to come. The strategy is deliberately unclassified to be transparent about what we need to achieve, and to hold ourselves accountable to the strategy we have signed up for.

Conclusion

Space capabilities are essential to overall military effectiveness and central to the Department's integrated deterrence strategy. As we contend with a dynamic security environment, the Department remains committed to making critical space investments to deter our competitors and prevail in conflict should deterrence fail.

On a personal note, it has been the honor of a lifetime to serve as the first Assistant Secretary of Defense for Space Policy. I will be deeply and forever proud of the work my team and I have done to both lead and push the Department forward at this critical time in history.

Thank you to the Committee for its tireless dedication to the Department and our servicemembers, and for the opportunity to come and speak to you one last time in this role. 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: FY25 Space Budget Hearing
STATEMENT OF: Honorable Frank Calvelli,
Assistant Secretary of the Air Force for Space Acquisition and Integration

May 1, 2024

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HOUSE ARMED SERVICES COMMITTEE
UNITED STATES HOUSE OF REPRESENTATIVES

OVERVIEW

Chairman Lamborn, Ranking Member Moulton, and distinguished members of the Committee, thank you for inviting me to testify before you today.

We continue to face an unprecedented strategic competitor in China, and our space environment continues to become more contested, congested, and competitive. We have seen exponential growth of in-space activity, including counterspace threats, and our adversaries would seek to deny us the advantage we get from space during a potential conflict.

To counter these threats, we continue to drive resiliency and transform our space architecture through proliferation, orbit diversification, disaggregation, utilization of commercial capabilities, cyber hardening, and collaboration with Allies and partners. Furthermore, my top initiative remains to drive **speed** into our space acquisitions and deliver programs on cost and schedule. The threat environment demands we deliver capabilities fast enough to detect threatening behavior in space, deny adversary advantage, deter aggressive actions, and, if necessary, defeat adversaries during a conflict.

Today I want to talk to you about how we are transforming the space architecture, the near-term capabilities we are delivering, the remaining challenges, and how I am managing the space acquisition enterprise to drive change and get after the threat with speed.

CONTINUING TO TRANSFORM THE SPACE ARCHITECTURE

The Space Force continues to pivot to a proliferated and resilient **missile warning and missile tracking** (MW/MT) architecture in low Earth orbit (LEO) and medium Earth orbit that focuses on tracking advanced threats by integrating critical missile tracking capabilities that previously did not exist. As we develop and deliver this new capability, we are also developing the Next Generation Overhead Persistent Infrared (OPIR) program, comprised of the Next Generation OPIR Geosynchronous (Next Gen GEO) and Next Gen OPIR Polar missile warning systems, as a bridge to enable the eventual transition to the resilient MW/MT architecture.

We continue to transform our **military satellite communications** (SATCOM) by disaggregating our strategic and tactical satellite architectures and leveraging new proliferated LEO capabilities. This approach adds resiliency and ensures our systems can operate through contested and degraded environments.

In collaboration with the National Reconnaissance Office (NRO), we are developing a **ground moving target indicator** (GMTI) solution to meet Combatant Command requirements. This capability will provide actionable information on adversary surface targets that the Space Force will deliver to the Joint Force. We selected this partnership with the NRO because their concept allows us to go **faster**, with **less technical risk**, and at **lower cost**. Again, acquisition speed is a top factor in our decision-making, and the partnership with the NRO allows us to develop space-based GMTI faster. Milestone B for this program will take place later this year.

Maintaining constant awareness of the battlespace, supplemented by the capability to accurately produce indications and warnings for malign behavior, is critical to the Space Force avoiding

operational surprise. To that end, our **space domain awareness** architecture leverages partnerships and data across the national security space enterprise and commercial sources to ensure we have a resilient, integrated, and diverse sensor architecture. We continue to invest in SILENTBARKER and the Deep Space Advanced Radar Capability (DARC).

The DARC program exemplifies international collaboration within the trilateral partnership agreement between the United States, the United Kingdom, and Australia, known as AUKUS. Earlier this year, we broke ground on DARC Site 1 at Harold E. Holt Naval Station, Australia. DARC extends the Space Force's umbrella of awareness in the space domain by establishing a clear picture of the operating environment and denying adversaries the ability to strike U.S. assets without warning. This summer, the DARC Site 2 design contract will be awarded for the planned United Kingdom location.

While awareness of the battlespace is critical, the ability to deny or defeat threats in, from, and to space is paramount. We are investing in classified programs that include capabilities to counter an adversary from using space to attack the U.S. homeland or the Joint Force. These investments, which cannot be discussed in detail in an unclassified setting, are fundamental to ensuring **space superiority**.

Maintaining assured access to space is vital to delivering capabilities to orbit when needed. With the growing launch demand and number of emerging launch providers, we designed the **National Security Space Launch (NSSL) Phase 3** strategy to pursue, for the first time, a dual-lane hybrid contracting approach to maximize access to commercial launch partners.

Lane 1 in NSSL Phase 3 allows an unlimited number of launch service providers to compete for our less complex missions that have higher risk tolerance. Lane 1 enables us to tap into new technologies as emerging providers and capabilities are ready. Lane 2 maintains our full mission assurance posture to support our toughest missions. While Lane 2 closely mirrors the current procurement approach in NSSL Phase 2, we added a third launch provider to promote the necessary resiliency in launching our most challenging and critical payloads.

DELIVERING CAPABILITY

In February 2024, the Space Force's Space Development Agency (SDA), in partnership with the Missile Defense Agency (MDA), successfully launched the final four **Tranche 0 Tracking Layer** satellites of the Proliferated Warfighter Space Architecture (PWSA) together with MDA's two Hypersonic and Ballistic Tracking Space Sensor satellites. This collaboration will enable simultaneous testing of SDA's MW/MT sensors with MDA's fire control sensors on the same exercise targets, from the same orbit, and deliver the quality data required to analyze and defeat advanced missile threats. Furthermore, this launch marked the final delivery of SDA's Tranche 0 constellation, culminating 27 total satellites delivered to orbit in nearly three years from contract award.

Later this year, SDA will start delivering roughly 160 **Tranche 1** satellites over 10 launches in 11 months. SDA's vendors are currently building all Tranche 1 satellites and the accompanying

ground infrastructure, including two new network operations centers that are on track for delivery later this year.

Not only are we demonstrating our ability to develop and proliferate with speed, but we are also introducing non-traditional prime vendors in **Tranche 2**. Incorporating new industry partners enhances our resiliency and increases our advantage against strategic competitors. These new vendors also demonstrate an encouraging industrial base response to our spiral development model of competing new tranches every two years.

We also kicked off this year with the successful first certification flight of United Launch Alliance's (ULA) **Vulcan Centaur launch vehicle**. This marks an important milestone on our path toward ending U.S. reliance on the Russian-made RD-180 engines that are used on Atlas V launch vehicles. The last Department of Defense (DoD) Atlas V launch is scheduled for this fall.

Fiscal Year (FY) 2024 marked the final order year of **NSSL Phase 2** and supports launches through 2027. We will award our **NSSL Phase 3** contracts this year for launch service orders beginning in FY25.

This April, Space Systems Command launched the first **Weather System Follow-on Microwave (WSF-M)** satellite. WSF-M is designed to replace the critical microwave capabilities of our legacy Defense Meteorological Satellite Program satellites which will reach end of life in 2026. WSF-M is equipped with a microwave imager to collect weather data such as ocean surface vector winds and tropical cyclone intensity, as well as snow depth, soil moisture, and sea ice characterization. This launch marks a critical step towards improving the collection of weather data in support of warfighter requirements.

In the same month, the **Evolved Strategic SATCOM (ESS)** program released its request for proposals (RFP) for the constellation's initial four satellites. ESS is the future backbone for Joint All-Domain Nuclear Command, Control, and Communications, and will replace Advanced Extremely High Frequency system services to provide global, integrated, survivable, resilient, and dynamic ground and satellite communications for assured strategic endurance. Contract award is targeted in FY25 to achieve Initial Operational Capability (IOC) by 2032.

We continue our commitment to provide highly accurate timing, three-dimensional positioning, and navigation information, in any weather, to an unlimited number of military and civilian users, anywhere on or above the surface of the Earth. In FY25, we are procuring two additional **Global Positioning System (GPS) III F** vehicles. Currently, there are 31 GPS satellites in operation, and another four in storage. Simultaneously, we are researching additional resilient positioning, navigation, and timing options, which may become a transformational effort in the future.

Another critical capability launching this year is **Geosynchronous Space Situational Awareness Program (GSSAP)**. GSSAP remains our hallmark program for space domain awareness. It is imperative we get this capability on orbit to support our warfighters by the end of the year.

Additionally, the **Ground-Based Optical Sensor System** program is on track to deliver upgrades to the Ground-Based Electro-Optical Deep Space Surveillance system at the White Sands Missile Range and Maui sites in FY25 and FY26, respectively. These upgrades, which include replacement of legacy optics, camera hardware, and software, are projected to allow the sites to make valuable space domain awareness contributions for the next 20 years, and will enable increased sensitivity and improved search rate, accuracy, and throughput.

To ensure our warfighters can count on space capabilities throughout the spectrum of conflict, we must maintain robust cybersecurity and cyber defense. As an example of cyber defense, we recently awarded a new task order for **Defensive Cyber Operations – Space**, consolidating and centralizing the current contracting vehicles to provide improved terms and cost control, and enhancing our cybersecurity posture and resilience.

CHALLENGES

Transforming the space architecture to combat the threat requires us to deliver warfighter capabilities on cost and schedule. Some challenging legacy programs remain, but we are aggressively managing these programs to ensure they deliver.

The three long-standing troubled programs, GPS Next Generation Operational Control Segment (**OCX**), Advanced Tracking and Launch Analysis System (**ATLAS**), and Military GPS User Equipment Increment 1 (**MGUE Inc 1**), need to get over the finish line.

OCX continues to be a challenging program. OCX is a prime example of the difficulty in tackling complex satellite command and control (C2) systems and extremely large software development all at once, a practice I am working to ensure is not repeated in the future. We are anticipating government acceptance of OCX later this year and completing the final Acquisition Program Baseline (APB) milestone of Ready to Transition to Operations in spring 2025. We are getting close to completing the baseline effort and need Congress' support with stable funding to ensure OCX can deliver.

ATLAS has made significant progress since we broke the program into more manageable deliverables. The program is now on schedule to deliver capability by September 2025 that, when coupled with existing Space Force C2 systems, will provide sufficient capability to enable the decommissioning of the legacy Space Defense Operations Center system.

MGUE Inc 1 is improving. Since the January 2021 re-baseline, MGUE Inc 1 has successfully completed several major milestones in line with the APB. The final milestone for the ground system circuit card was completed in March 2021, and that card is in production. The aviation/maritime card completed Manufacturing Readiness Assessment in May 2023, enabling it to enter Low-Rate Initial Production. MGUE Inc 1 remains on track to meet its two remaining APB milestones: Program Executive Officer (PEO) Certification for the U.S. Navy Arleigh Burke Class Destroyer and the U.S. Air Force B-2 Bomber. The program will work through follow-on developmental and operational testing in FY25, which is expected to result in formal delivery and close-out of MGUE Inc 1.

In addition to these legacy troubled programs, another program I am watching closely is **Next Gen GEO**. The Next Gen GEO program must deliver the primary mission payload this spring and continue to make progress and stay on schedule for Vehicle 1. The payload is in test, but over a year late. We cannot afford delays, and I am engaging with this program frequently to mitigate further slips.

Furthermore, **launch** is foundational to our ability to deliver critical capabilities to orbit, and we need the commercial launch industry ready to meet the growing demand. Over the last five years, ULA averaged only six to seven launches per year, and now, with the growth in demand, needs to significantly increase its cadence to around twice a month. ULA's ability to ramp up starts with the successful completion of the second Vulcan certification flight. Failure to complete the second certification flight will delay the launch of critical national security payloads this year, including GPS III-7, USSF-106, and USSF-87. In parallel, Blue Origin needs to scale its production of BE-4 engines. We are keeping an eye on whether these two companies can scale to meet our needs.

We have proven we can build small satellites quickly. As we start to deliver PWSA operational ground and 126 Tranche 1 Transport Layer satellites this fall, **adoption and use of Tranche 1 next year will be key**.

Finally, thanks to the Assistant Secretary of Defense for Space Policy's efforts in rewriting DoD's Space Classification Policy in December 2023, we are working on recommendations for the Deputy Secretary of Defense to **move large amounts of critical program information out of Special Access Program stovepipes**. Reducing classification barriers will significantly improve our ability to integrate space with other domains and enable better sharing with our Allies and partners.

MANAGING THE SPACE ACQUISITION ENTERPRISE

I have issued three sets of guidance to the space acquisition workforce since my confirmation in April 2022 that define our space acquisition tenets, the formula for going fast in space acquisition, and a list of essential program management skills. This guidance is key to improving the space acquisition enterprise.

In October 2022, I established strategic acquisition guidance outlining nine **Space Acquisition Tenets** (Appendix A) that formed the basis of a new direction to transform our space acquisition enterprise. These nine tenets strike at the core issues that slow us down. To emphasize how the tenets enable speed, last year I shared a **simple formula for going fast in space acquisition** (Appendix B), which now serves as the cornerstone of our approach to build resilient architectures faster. The tenets and formula provide the vision for how our space acquisition workforce will deliver space capabilities to outpace the threats. Aligned with this vision, our space acquisition workforce is adopting a culture of speed and must hone the **essential program management skills** outlined in the guidance I issued in December 2023 (Appendix C) to be successful.

When the tenets, formula, and essential skills are applied, our space acquisition enterprise will

transform the space architecture while continuing to provide crucial capabilities for our nation. This approach is all about **speed in space acquisitions** and can be applied to all systems in all orbits to get capabilities to the warfighter on operationally relevant timelines.

While designed to focus on speed, the formula yields additional benefits, including enhanced workforce satisfaction and faster technology refresh. First, the workforce can participate in an entire acquisition from start to launch in just three years. With a traditional 7- to 10-year large development effort, we see significant personnel turnover during that timeframe. Typically, the government would have at least three different program managers over the course of a program – generally one program manager gets the program started, the next one gets the program through Critical Design Review, and the next one may get to IOC. By doing shorter development cycles, a single program manager and their team will be able to see the entire acquisition through and will be accountable for the entire end-to-end effort. Therefore, the team will have more ownership, which has positive implications for both the government and industry workforces.

Second, we have the opportunity for significantly faster technology refresh. Using the formula, technology refresh occurs every three years. Compare that with larger traditional space acquisitions where technology insertion and refresh are measured in 10, 15, or even more years depending on the program. The formula inherently drives faster modernization of our space assets, by allowing the on-ramp of new technologies every three years.

So now that we have the tools, we need to execute. **Our job and our top priority as acquisition professionals is centered around execution.** Simply defined, this means we must deliver programs on cost and schedule that work.

My focus is on ensuring that our acquisition strategy and RFP documents are realistic and executable. This means that our source selection plans must lead to awarding executable contracts. These are contracts with realistic and achievable cost and schedule baselines, performed by contractors with the right expertise, skills, and staff to do the job. Once under contract, we must proactively manage program baselines to deliver systems that work on cost and schedule.

Delivering on schedule is important because we must be ready to secure U.S. interests in, from, and to space, which includes supporting the Joint Force. Given the threats and increased capabilities of our competitors, and with our relatively flat funding, delivering on cost is more critical than ever. Every time we overrun a program, we basically rob our future efforts to modernize or do anything new, which does not allow us to stay ahead of threats to U.S. interests. We also stifle future innovation by limiting investment dollars to cover schedule slips and cost overruns. We simply cannot afford to do this anymore.

To maintain focus on execution, I remain committed to a battle rhythm of proactive, frequent engagement and periodic strategic reviews of our programs with my portfolio managers and PEOs. I continue to conduct status reviews with each of my PEOs 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. Troubled programs continue to receive deliberate attention and targeted intervention to return them 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.

I also continue to use the **Space Acquisition Council (SAC)** as a mechanism for fostering integration. Thanks to Congress, the SAC continues to be an integration forum among key leaders in the national security space community. Monthly meetings have covered a wide range of key topics with all major space stakeholders. The SAC remains a valuable tool to ensure coordination and synchronization of the national security space enterprise.

CONCLUSION

We continue to transform the space architecture to be more resilient and provide additional capabilities for the Joint Force. Our focus is on speed in our acquisitions and delivering programs on cost and schedule.

Thank you to the Committee for all your support to the Space Force and space acquisition. I look forward to your questions.



DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

31 October 2022

MEMORANDUM FOR THE DEPARTMENT OF AIR FORCE SPACE ACQUISITION
WORKFORCE

SUBJECT: Space Acquisition Tenets

As threats to space systems continue to evolve, and as space becomes even more important in protecting and giving an advantage to our troops, timely delivery of space capabilities becomes even more critical for the Nation. Our top three priorities for space acquisition include driving **speed** into our acquisitions in order to deliver new capabilities faster to outpace our adversaries and maintain the technological advantage we get from space; making our space architecture more **resilient** so that it can be counted on during times of crisis and conflict; and **integrating** our space architecture with other war fighting domains and across the Department's Operational Imperatives to give our warfighters a strategic edge.

The traditional ways of doing space acquisition must be reformed in order to add speed to our acquisitions to meet our priorities. Former approaches of developing a small amount of large satellites along with large monolithic ground systems that took many years to develop on cost plus contracts can no longer be the norm. To gain speed we must shorten development timelines by building smaller satellites, acquiring ground and software intensive systems in smaller more manageable pieces that can be delivered faster, using existing technology and designs to reduce non-recurring engineering to enable speed, taking advantage of commercial systems and capabilities, and most importantly delivering programs on cost and schedule through solid program management discipline and execution.

To enable this space acquisition philosophy going forward, the following **9 Space Acquisition Tenets** will serve as guideposts for space acquisition:

1) Build Smaller Satellites, Smaller Ground Systems, and Minimize Non-Recurring Engineering

Build smaller satellites in order to shorten development timelines from many years to just a couple. Use existing technology and designs to minimize non-recurring engineering and shorten development schedules. This will have the additional benefit of accelerating technology refresh as well. Acquire ground and software intensive systems in smaller more manageable pieces that can be delivered faster.

2) Get the Acquisition Strategy Correct

Establish good acquisition strategies up front including contract type and contract incentives for both speed, and performance. Have clear, specific, unambiguous Statements of Work

(SOW), concepts of operations, and requirements for the request for proposal. Minimize and avoid Government Furnished Equipment (GFE) and avoid putting the government in the middle of multiple contracts as the integrator. Be clear on how you will engage and interact with industry within your SOW and minimize the Contracts Data Requirements List (CDRLs) to critical items. Do not be afraid to use fixed price contracts. Fixed price contracts increase the level of program management discipline across industry and the Government. Use red teams, and peer reviews, as well as the Acquisition Strategy Process to set a good strategy.

3) Enable Teamwork Between Contracting Officer and Program Manager

The relationship between the Contracting Officer and the Program Manager are key to any successful acquisition. Contracting Officers should be collocated within and be part of the Program Executive Officer (PEO) teams. It's a solid team between the Program Manager and Contracting Officer during all phases of acquisitions that will enable success.

4) Award Executable Contracts

Evaluate cost and schedule realism as part of the proposal evaluation to avoid low bids and buy ins. Ensure companies have the correct skills to successfully execute the contract on cost, schedule, and meeting performance. Negotiation between Government and industry should be Win-Win – the Government gets a capability fast that works, and industry has a right to a fair profit. Keep up with news and information about the space industrial base. Understand what companies are capable of doing or not doing otherwise this can lead to awarding development contracts to companies that do not have the experience, skills, and domain expertise to do the job.

5) Maintain Program Stability

Establish the contract cost and schedule baseline and manage to it. Push back on year-to-year budget changes that drive rebaselining which diminish speed from acquisitions. Avoid Undefined Contract Actions (UCAs) that last more than a few months and budget promises to fix programs the following fiscal year. Avoid accepting new requirements after going on contract, and do not accept requirements that industry cannot technically meet.

6) Avoid SAPs and Over Classifying

Putting programs in a Special Access Program (SAP) hinders our ability to integrate space capabilities across other domains. Protect capabilities, if necessary, through normal security classification guidelines such as SECRET and TOP SECRET but avoid creating stovepipes with SAPs which can limit our ability to integrate with other domains and can hinder getting ideas from a broader pool of industry. Avoid classifying systems as NOFORN to enable future sharing with Allies and Partners.

7) Deliver Ground Before Launch

Ensure ground systems and modifications are completed and ready for operations before launch of a new capability. This will allow operations/users to take advantage of new capabilities after launch.

8) Hold Industry Accountable for Results

Hold industry accountable to execute on cost, schedule, and meeting performance commitments on the contract. With the urgent need to provide new space capabilities faster and for architecture resiliency, do not tolerate bad performance that we have seen in some traditional large satellite and large ground cost plus contracts. Take corrective action and consider all tools available for poor performers including loss of fee, use of the Contractor Responsibility Watch List, and if necessary, stopping programs. Industry works for you, so be a demanding customer.

9) Execute – Deliver Capabilities that Work, and Deliver them on Schedule and on Cost

Proactively manage the program by continuing to actively track schedule, cost, and technical progress. Identify issues early in order to quickly resolve them. There is no better way to get speed into acquisitions than to deliver programs that meet performance requirements, on schedule and on cost. This is our most important tenet. Success is measured by executing on plan.



FRANK CALVELLI
Assistant Secretary of the Air Force
(Space Acquisition & Integration)

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DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

05 April 2023

MEMORANDUM FOR THE DEPARTMENT OF AIR FORCE SPACE ACQUISITION
WORKFORCE

SUBJECT: **Three Years or Less from Contract Start to Launch - A Simple Formula to Go Fast in Space Acquisition**

Today our space systems are increasingly under threat. Strategic competitors want to deny our advantage in space during a potential conflict. Our current space architecture was designed when space was a benign environment. Previously, building large satellites with long development cycles, on cost-plus contracts made sense, but that time has passed. To meet the pacing threat, we are **transforming** from the few 'big juicy targets' of the past to a more proliferated and resilient architecture that can be counted on during times of crisis and conflict.

Based on the 9 Space Acquisition Tenets, a simple formula can be derived for going fast in space acquisition:

- 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

To deliver capabilities faster, we must **build smaller satellites**. Even with minimal non-recurring engineering (NRE) or minimal design changes, large satellites take time. They require big bus structures, big tanks, big payloads, and big components, which all take time to develop and test. Further, few missions require us to build big, and we should disaggregate larger systems into smaller, more proliferated systems, across all orbits. Building smaller satellites allows us to accelerate.

Next, we must **minimize NRE by using existing designs and technology** to drive shorter development cycles. Our current acquisition culture allows government and industry to drive onerous development of new technologies as a foundation for major systems acquisitions. This drives significant NRE on contract, prolongs program schedules, and often prompts cost plus contracts. There was nothing wrong with this approach in the past, but now real threats in the space domain force a different solution.

To counter present and future threats, we must capitalize on government research and development, industry internal research and development (IRAD), and corporate commercial investments to create new technologies we can incorporate into our acquisition programs. For example, we should leverage commercial satellite buses, and existing focal plane technology

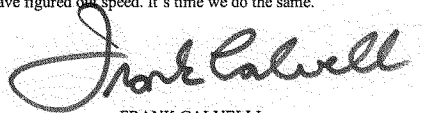
rather than build new or improved. Coupled with shorter development timelines, this approach also has the benefit of allowing for much faster technology refresh.

Delivering space capabilities faster requires program baseline stability. The last two elements of the formula address program stability by **shortening contract timelines to three years or less from authority to proceed to launch** and by using **fixed-price contracts**. Instability and constant changes to a program baseline kills acquisition speed and typically occurs on long development efforts. Baseline instability is caused by rethinking and modifying program scope each budget season, changing requirements, long undefinitized contract actions, annual cost re-estimating on cost-plus contracts, and using multiple contract actions to develop a single class of satellites.

By building smaller satellites and reducing NRE, we can scope programs to be achievable in three years or less. With shorter acquisition contracts, fixed-price contracting adds a level of discipline, prevents the constant rethinking of programs and scope changes with each yearly budget build, avoids changes from cost re-estimating, stops requirement changes, and promotes competition from more commercial-like/non-traditional space companies. Having stable baselines allows us to go fast.

Overall, this formula and approach is all about speed in space acquisitions. It can be applied to all systems and all orbits. We should continue to **disaggregate** traditional larger systems with multiple payloads into smaller satellites, **diversify** orbits, and **proliferate**. When we follow this formula, along with the 9 Space Acquisition Tenets, we will deliver needed capabilities to warfighters faster, transition to a more resilient and capable space architecture, achieve our Operational Imperatives, and counter the growing threats to our space systems.

Our competitors seem to have figured out speed. It's time we do the same.



FRANK CALVELLI
Assistant Secretary of the Air Force
(Space Acquisition & Integration)

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DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

18 December 2023

**MEMORANDUM FOR THE DEPARTMENT OF AIR FORCE SPACE ACQUISITION
WORKFORCE**

SUBJECT: Essential Program Management Skills for Government Space Acquisition Professionals

We have defined our 9 Space Acquisition Tenets to drive space acquisition, as well as our Formula for going fast. The third and final piece of the puzzle is you - our amazing and dedicated space program managers and acquisition professionals. Here are some of the things you need to learn and gain experience with that will allow you to drive acquisition speed, deliver programs on cost and schedule, and be successful in your career.

1) Master the Fundamentals of Acquisition

Learn the different contract types and incentive strategies and when to apply them. Be able to develop an acquisition strategy, statement of work, and elements of a competitive request for proposal including Section L and M. Get source selection experience by leading or being part of a team and learn how to negotiate a contract. As part of the proposal evaluation process, be able to evaluate schedule, cost, staffing realism, and whether the company has the skills and expertise to successfully execute the program on cost and schedule. Know the acquisition rules and take advantage of flexibility provided in the DoD 5000 series and Adaptive Acquisition Framework.

The ability to develop a good acquisition strategy, well crafted request for proposals, and awarding executable contracts are key to successful space acquisition.

2) Develop Expertise in Satellite Development and/or Ground Software Development

Having a deep technical understanding of what it takes to acquire and develop a satellite or ground system allows you to proactively solve technical issues, review contractor design material, challenge technical assumptions, effectively evaluate technical proposals, make better decisions, reduce technical risks, and drive the acquisition to deliver on cost and schedule.

3) Relentlessly Manage Your Program Baseline

Learn how to effectively manage a program once under contract and how to measure technical and programmatic progress. Engage daily and take action to solve technical issues early.

Learn how to evaluate and analyze a contractor schedule and critical path. Track schedule, cost, technical, and staffing status by routinely reviewing planned vs actual achievements.

Understand the different types of margin including cost and schedule and how to apply them. Actively address and manage risks by using a simple risk management process to track and address risks.

Delivering on cost and schedule is a critical element of speed. We need to execute and meet our commitments by delivering programs that work, on schedule and on cost.

4) Utilize Critical Thinking and Effective Communication Skills

Develop and use critical thinking skills when reviewing program status information, and when reviewing data to assess and solve difficult technical issues. Be able to effectively present programmatic data and technical status of your program to all stakeholders. Have good written, presentation, and email skills.

Being able to think critically and communicate effectively are key skills that will allow you to ask the right questions and convey complex technical information effectively.

5) Understand How Industry Operates and What Motivates Them

Learn how industry operates and what motivates them by analyzing financial statements, and top level financial ratios. Review industry annual 10-Ks and quarterly reports. Understand the role of revenue, growth, profit, free cash flow, and contract backlog play on company financial reporting.

Track industry capabilities of both traditional defense contractors, and commercial space companies. Know what industry can and can't do. Avoid awarding new non-recurring engineering for capabilities that already exist at a different company. Take advantage of commercial capabilities and services to drive speed.

6) Team with Mission Operations

Team with operations early on in the acquisition life cycle. Work with operations to develop easy to operate user interfaces, test and acceptance strategies, training plans, and facility implications of your system (e.g., power and floor space).

Understand how the current system is operated and make sure you are replacing it with a better capability.

Think life cycle costs and plan accordingly in the budget for sustainment and maintenance.

7) Share, Collaborate, and Help Each Other

Help each other be successful. Share best practices on request for proposals, statements of work, test and transition plans, etc. Share lessons learned on successful and challenged programs. Ask for help on tough programs and do peer reviews to help each other solve difficult issues.

We are all in this together across the Department. We all need to help each other, learn from each other, and help everyone succeed across the Department for the mission.

8) Know Your Mission Area and Drive the Future

Whether its space domain awareness, missile warning, positioning navigation and timing, military satellite communications, space sensing, or other missions, develop a deep technical understanding of your mission area. It is critical to keep up to date with current intelligence and threats your mission area may be facing.

Use your understanding of the mission to identify mission gaps and shortfalls, drive research and development, and define future acquisitions to provide additional capabilities needed for the mission.

9) Become Proficient with the Budget Cycle and Working with Congress

Understand how the budget process works within your organization, at the Pentagon, and in Congress. Get experience developing budgets for your program and defending them in the budget process. Look for opportunities to brief Congressional Staffers and Members of Congress on your program and create an environment of program transparency.

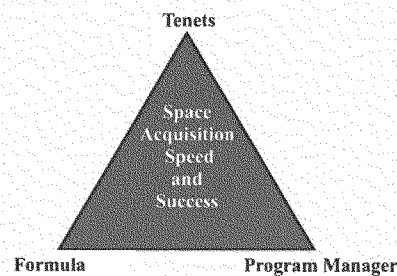
A key part of program management is your ability to define and defend your budget, as well as interacting and keeping Congress informed.

10) Ensure Your Program Integrates End to End and Works as a System

Understand the bigger picture of how your system fits in to the mission and interfaces with other programs. Make sure your portion of the program integrates with other pieces to form a complete system or capability. Develop systems engineering skills to compliment your program management skills and ensure cross program interfaces are defined and properly tested.

What you are developing may only be one part of an overall system. It is critical that you have the systems engineering skills and perspective to ensure your program integrates properly with other elements to form an end-to-end system.

Experience takes time. These are essential skills you need to learn and use over your career in space acquisition. If you use all three pieces of the puzzle, the 9 "Space Acquisition Tenets", the "Simple Formula to Go Fast in Space Acquisition" and the "Essential Program Management Skills for Government Space Acquisition Professionals" we will rapidly transform our space architecture to be more proliferated, more resilient, and provide needed capabilities for our Nation at speed.



FRANK CALVELLI
Assistant Secretary of the Air Force
(Space Acquisition & Integration)

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BIOGRAPHY



UNITED STATES AIR FORCE

FRANK CALVELLI

Frank Calvelli is the Assistant Secretary of the Air Force for Space Acquisition 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.

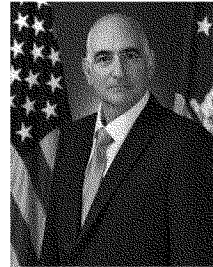
EDUCATION

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)



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Statement for the Record of Dr. Troy E. Meink
Principal Deputy Director, National Reconnaissance Office

House Armed Services Committee, Subcommittee on Strategic Forces
Hearing on "Fiscal Year 2025 National Security Space Programs"

Wednesday, May 1, 2024

EMBARGOED FOR PUBLIC RELEASE UNTIL HEARING DATE

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Introduction:

- Chairman Lamborn, Ranking Member Moulton, and members of the subcommittee... it is a pleasure to appear before you today with my colleagues ... and to represent the people of the National Reconnaissance Office.
- For more than 60 years, the NRO has been developing tools and techniques that advance our national security. Today we are building on that legacy of innovation to make the United States even safer and stronger. Space-based intelligence has become a primary, if not the primary, means of collection in denied areas.
- This is especially critical as our competitors are seeking to deny our strategic intelligence advantage. With Congress's support, and with the continued innovation of the NRO's talented workforce and trusted partnerships, we will ensure America retains its strategic advantage in space.

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- **Our FY25 budget request aims to keep the United States the world's leader in space-based intelligence, surveillance, and reconnaissance, or ISR. It prioritizes investment in a diverse and resilient constellation to meet the needs of all intelligence customers, including warfighters and allies.**
- **We are committed to using taxpayer dollars effectively and efficiently. I'm proud to report that our commitment to fiscal accountability earned the NRO our 15th consecutive clean financial statement audit for Fiscal Year 2023.**
- **Our effectiveness and efficiency are the result of the flexibility afforded to us under the authorities of both Title 10 and Title 50, as the NRO is a member of both the Defense Intelligence Enterprise and the Intelligence Community.**

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NRO capabilities:

- Our investments in tools and technology—both on the ground and on orbit—ensure our customers get the information they need, where they need it, faster than ever before. We enable real-time decision-making to protect the nation and our allies.
- With the support of Congress, the NRO will continue to invest in...
 - government-engineered, industry-built satellites that are resilient by design;
 - partnerships that allow us to maximize our impact; and
 - developing the world's most advanced tools, information technology, and communications networks – allowing us to fuse critical data and deliver it to our customers anywhere on Earth.

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Resilience:

- Over the next decade, the NRO will continue to increase the number of satellites operating across multiple orbits – not just large, very capable, exquisite systems, but also smaller, proliferated systems.
- Later this month, the first phase of our proliferated architecture is currently scheduled to launch as NROL-146. We've already launched a number of demonstrations over the last few years to verify cost and performance, but this will be the first launch of the operational system. These systems will increase timeliness of access, diversify communications pathways, and enhance our resilience.
- For our ground systems and more exquisite on-orbit capabilities, we are strengthening our cyber defenses, eliminating single points of failure, and hardening our architecture. This will also enable systems to be more resilient.

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Innovation:

- The NRO has been at the forefront of innovation since our inception, and today that culture of innovation is as strong as ever.
- Our highly skilled workforce of military and civilians brings diverse viewpoints and innovative ideas to solve complex intelligence challenges.
- One example – we are using artificial intelligence and machine learning to manage capabilities within our constellations. This enables us to deliver data at speed and in the most efficient way possible to support both analysts and warfighters.

People & Partnerships:

- Partnerships are inherent in who we are. Our workforce is a blend of government civilians and members of every military service. As we evolve to meet changing mission needs, we look forward to continued collaboration on

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personnel support from our civilian and military partners.

- We maximize our impact when we partner with our colleagues across the intelligence and defense communities to leverage every possible innovation and optimize our collective talents, tools, and effectiveness.
- For example, our partnership with U.S. Space Force, and previously the Air Force, on launch procurement has provided assured access to space for NRO's systems for over 15 years. We are fully committed to Phase 3 of the National Security Space Launch Program. The U.S. Space Force has been a great partner in incorporating our needs into the contract with Lane 1 and Lane 2 options.

Closing:

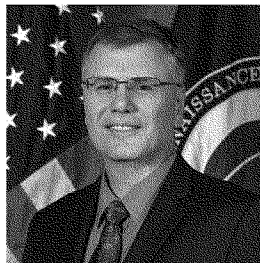
- Our continued success depends on our ability to adapt and to innovate, and on Congress' continued support for our mission. New technology, new partnerships, and the talents of our workforce are critical to maintaining our competitive advantage and keeping America safe.

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- **On behalf of the entire NRO workforce, I appreciate the opportunity to appear before you today. Thank you for your time, and I look forward to answering your questions.**

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DR. TROY E. MEINKNRO LEADERSHIP > **DR. TROY E. MEINK****DR. TROY E. MEINK****PRINCIPAL DEPUTY DIRECTOR, NRO**

Dr. Troy E. Meink was appointed Principal Deputy Director, National Reconnaissance Office (PDDNRO) on 5 October, 2020. As the PDDNRO he provides overall day-to-day management of the NRO, with decision responsibility as delegated by the Director, NRO (DNRO). In the absence of the DNRO, he acts on the Director's behalf on all matters.

Dr. Meink is from Lemmon, South Dakota and entered the Air Force in 1988 through the ROTC program at South Dakota State University. His assignments have included operations and training, systems engineering, research and development, and program management of major defense acquisition programs. Dr. Meink began his career as a KC-135 Tanker Navigator and Instructor and then a lead test engineer for the design and evaluation of ballistic missile test vehicles for the Missile Defense Agency.

As an Air Force Civilian, he managed multiple next generation joint research and development programs transitioning global space capabilities, optical sensors, and advanced structures. He subsequently led development for the Military Satellite Communications Joint Program Office and served as program director for the Transformational Satellite Communications System. He was Director, Communications Directorate, Office of the Assistant Secretary of Defense/Networks and Information Integration, and the Director, Signal Intelligence Systems Acquisition, National Reconnaissance Office (NRO). Dr. Meink left the NRO for a time when he was assigned to the Department of the Air Force as the Undersecretary of the Air Force for Space and the Director, Executive Agent for Space Staff in Washington, D.C. Dr. Meink then served as the Assistant Director of National Intelligence for Systems and Resource Analyses.

His previous assignment was as Director, Geospatial Intelligence Systems Acquisition (GEOINT) at the NRO, starting in April 2017. In that capacity, Dr. Meink was responsible for the successful execution of all national geospatial intelligence satellite systems acquisitions within the NRO with a budget of more than \$15 billion.

EMBARGOED FOR PUBLIC RELEASE UNTIL HEARING DATE

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 2025 National Security Space
Programs

Wednesday, May 1, 2024



EMBARGOED FOR PUBLIC RELEASE UNTIL HEARING DATE
Approved for public release, NGA-U-2024-00909

Good afternoon, 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 our nation's leading authority for geospatial intelligence (GEOINT), providing warfighters, policymakers, intelligence professionals, and first responders the decision advantage they need to develop and carry out national security objectives at home and abroad. The GEOINT we deliver conveys not only what, when, and where events are happening but also illustrates how they are occurring, their implications, and what is likely to transpire next.

Most of our GEOINT data sources are space-based systems – including U.S. national technical means and commercial satellites – that are tasked by NGA's collection experts to produce imagery exploited by our analysts to provide timely warning of imminent threats in global hot spots and unique insights on critical issues around the world. NGA remains committed to delivering GEOINT that advances national security priorities and continues to ensure the security of space.

NGA has 14,500 intelligence professionals dedicated to ensuring GEOINT gets to those who need it every day. Spread across more than 100 locations in the U.S. and around the world, our teams are embedded within many government agencies, each combatant command headquarters, service intelligence centers and most warfighting headquarters. We have teams co-located with United States Space Force, United States Space Command, and National Reconnaissance Office.

Dual-hatted as an Intelligence Agency and Combat Support Agency, NGA provides GEOINT to the Services, combatant commands, and other federal departments and agencies. This includes tasking, analysis, and dissemination of national technical means and commercial imagery, data, and GEOINT analytic services and products in support of National System for GEOINT community requirements.

Obtaining the data used to produce GEOINT is not a simple task. NGA relies on a team of highly skilled professionals to conduct a process we call informed collection orchestration, choreographing an increasingly complex and capable constellation of space-based GEOINT assets. Informed collection orchestration is the art of tasking pieces of the collection puzzle to align with national priorities, operational and analytical needs, and real-world deadlines. It is central to ensuring that our warfighters and intelligence professionals alike receive the imagery and analysis they need, when they need it.

NGA is committed to maximizing efficient and effective use of available GEOINT sensors, enabling GEOINT collection to be at the right location, at the right time, to meet service and combatant command needs. NGA's role in informed collection orchestration is not only in statute, policy, and practice—it is rooted in our expertise as leaders in the GEOINT discipline. We work in close partnership with our Department of Defense/Intelligence Community and Allied mission partners to optimize GEOINT collection to support a full range of missions including warning, targeting, and safety of navigation.

Informed collection orchestration also accounts for the growing role of commercial GEOINT. NGA prioritizes agile, flexible and timely acquisition of commercial services and analytics as part of a concerted effort to meet the operational needs of partners across the National System for Geospatial Intelligence.

NGA leads a community-wide process to coordinate commercial GEOINT purchases across the government, reducing redundancy in the acquisition of commercial imagery pixels and commercial analytic services, while maximizing our ability to share that data with those organizations and partner nations. NGA also coordinates with the Commercial Remote Sensing Regulatory Affairs Office (CRSRA) at the Department of Commerce on regulatory, legislative, and policy activities for U.S. commercial remote sensing vendors, ensuring national security concerns and needs are balanced with promoting a robust U.S. space industrial base.

These efforts are resulting in significant growth in the volume of available GEOINT data and data sources. Accordingly, NGA is investing in automation to speed workflows, as well as artificial intelligence (AI) and machine learning to fuse data to enable sense-making. We are leveraging computer vision to rapidly exploit data; using advancing modeling techniques to understand, correlate, and predict activity; and integrating automated modeling capabilities to prompt dynamic collection.

NGA is also incorporating AI into warfighting headquarters around the world through programs like Maven, accelerating their operations and decision speeds. We continue to increase the fidelity of target identification, improve geolocation accuracy, and refine our test-and-evaluation process, ensuring that our warfighters can be confident in the information provided through AI tools.

As we invest in AI, it is important to understand that it is an enhancement to, and not a replacement for, our GEOINT workforce. Our goal is the safe, responsible, and accurate application of AI, including validation of our models and training of the people employing them.

While NGA's role in performing GEOINT analysis using space-based collectors is relatively well known, we are also leading in the space domain on a number of lesser known missions. For instance, NGA maintains detailed, physical characterizations of our planet from the ocean floor to beyond the Earth's atmosphere, and we use that foundational data to provide products that our forces require to navigate and operate safely every day, everywhere around the globe. Just as with imagery analysis, we rely upon space-, air-, and land-based sensors to perform these critical functions.

Furthermore, NGA is responsible for guaranteeing assured precision and accuracy of GPS and maintaining the World Geodetic System 1984, WGS-84, reference frame, which is the backbone for all geolocation. This effort also improves GPS geolocation accuracy for government civil agencies, guaranteeing assured precision, navigation, timing, and targeting.

Without question, NGA recognizes the critical role that space-based systems play in providing us the data we need to carry out our mission. But just as we recognize the importance of these assets, as well as the need to understand all activities occurring in the space realm, so too do our global competitors. Our most capable, potential adversaries and others continue to invest in increasingly threatening counterspace systems, intended to disrupt or deny critical space systems and services that not only support our national security, but also our everyday lives. Since the establishment of United States Space Command and the United States Space Force in 2019, followed by the creation of the National Space Intelligence Center in 2022, NGA has increasingly focused our efforts on understanding our adversaries' space-related activities on Earth and in space.

In closing, NGA relies heavily on the data that comes from space systems to meet the GEOINT needs of our Department of Defense and Intelligence Community. We operate at the speed of need – and are more integrated across DOD and the IC, and faster than ever before. We have the unique expertise in understanding the capabilities and limitations of our national and commercial GEOINT capabilities, as well as the experience necessary to meet needs that range from navigation to solving intelligence problems.

Thank you and I look forward to answering your questions.



Tonya P. Wilkerson
Deputy Director, NGA

Tonya P. Wilkerson serves as the ninth Deputy Director of the National Geospatial-Intelligence Agency. 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.

**WITNESS RESPONSES TO QUESTIONS ASKED DURING
THE HEARING**

MAY 1, 2024

RESPONSE TO QUESTION SUBMITTED BY MR. GARAMENDI

Mr. CALVELLI. Yes, the U.S. Space Force possesses ability to be aware of space activities through its Space Domain Awareness (SDA) capabilities. The U.S. Space Force distinguishes SDA into four functions: 1) Detect/Track/Identify, 2) Characterization, 3) Threat Warning and Assessment, and 4) Data Integration and Exploitation. As a result, the Service has invested in space- and ground-based sensors and the purchasing of commercial data to be able to build patterns of life and identify potential threats in the low, medium, and geosynchronous Earth orbits.

This sensor data can be integrated and exploited to provide planners, operators, and decision makers a comprehensive picture to determine the best courses of action. In FY25, USSF plans to invest \$826.3M in critical sensing capabilities, including continuing construction of the Deep Space Advanced Radar Capability (DARC) Site 1 at Harold E. Holt Station, Australia, complete development of the first Ground-Based Optical Surveillance System (GBOSS) site at White Sands Missile Range, and purchase optics for the second GBOSS site at Maui. [See page 23.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MAY 1, 2024

RESPONSE TO QUESTIONS SUBMITTED BY MR. LAMBORN

Mr. LAMBORN. It's vitally important that we exercise our National Technical Means to detect, track, intercept hypersonic threats.

1. Can you please describe the resources the NRO is putting toward detecting and tracking hypersonic threats? 2. Which organs of the NRO are responsible for this mission? 3. How is the NRO leveraging commercial hypersonic entities to ensure it's systems are properly calibrated and able to detect and track hypersonic threats?

Dr. MEINK. This response contains controlled or classified information. Member of office should contact committee staff to review.

Mr. LAMBORN. It's vitally important that we exercise our National Technical Means to detect, track, intercept hypersonic threats.

1. Can you please describe the resources the NGA is putting toward detecting and tracking hypersonic threats? 2. Which organs of NGA are responsible for this mission? 3. How is the NGA leveraging commercial hypersonic entities to ensure it's systems and people are properly calibrated trained to detect and track hypersonic threats?

Ms. WILKERSON. This response contains sensitive or classified information. The Member office should contact committee staff to review.

RESPONSE TO QUESTIONS SUBMITTED BY MR. GARAMENDI

Mr. GARAMENDI. Careful attention is being paid to Space Force's acquisition approach for Phase 3 of the National Security Space Launch Program, which procures commercial launch services for our key military satellites. What is the timeline, or date, when you expect Phase 3 awards will be made? Do you expect all Lane 2 Offerors to have conducted all necessary certification flights in order to allocate missions this year?

Mr. CALVELLI. The NSSL Phase 3 acquisition has two lanes. Lane 1 provides access to diverse and innovative emerging options as they become available for the more risk-tolerant missions and utilizes a tailored mission assurance approach. Lane 2 ensures assured access to space for the hardest, "no-fail" missions by placing a priority on meeting all NSSL requirements, including full government mission assurance with NSSL-certified launch vehicles. On June 13, 2024, we awarded the Phase 3 Lane 1 Indefinite-Delivery Indefinite-Quantity (IDIQ) contracts to United Launch Alliance, SpaceX, and Blue Origin. There will be annual Lane 1 IDIQ on-ramping opportunities to allow emerging launch service providers or systems to compete when ready. Phase 3 Lane 2 contracts are expected to award in the January 2025 timeframe. We intend to award up to three Lane 2 contracts.

Phase 3 Lane 2 is currently in source selection with specific bidder information being considered source selection sensitive. Among other considerations, Lane 2 bidders are being evaluated on their ability to certify by October 1, 2026. To minimize launch delays due to launch vehicle readiness, Lane 2 Order Year 1 (FY25) missions will only be awarded to companies who have completed certification by the contract award date. Additionally, subsequent missions will only be assigned to awardees who have completed certification by 1 October of the respective Order Year.

RESPONSE TO QUESTIONS SUBMITTED BY MR. CARBAJAL

Mr. CARBAJAL. We hear about "buy before you build" and "commercial first," and there are policies and presidential directives that provide similar guidance. There is a lot of rhetoric that seems to push towards leveraging commercial capabilities within the IC, yet when we examine the budget allocations and requirements aligned with commercial services, like the NRP (National Reconnaissance Program) and NGP (National Geospatial-Intelligence Program), the proportion is relatively small, even with the initial steps of EOCL (Electro-Optical Commercial Layer), Luno, etc.

The domestic commercial industry has also contributed significantly in terms of data and analytics that are particularly evident in missions like those in Ukraine

and CENTCOM support, yet the current investment in leveraging and developing such solutions appears minimal. Could you elaborate on your plans to allocate resources more effectively to harness the proven benefits of greater commercial support and meet these policy and strategic objectives, fostering great innovation and enabling the unique capabilities that only the government can provide?

Dr. MEINK. This response contains controlled or classified information. Member of office should contact committee staff to review.

Mr. CARBAJAL. EOCL and Luno aside, how are your organizations continuing to give the commercial industry an opportunity to meet more and more of the traditional and legacy requirements that have previously been met by the government, especially when looking forward?

Dr. MEINK. This response contains controlled or classified information. Member of office should contact committee staff to review.

Mr. CARBAJAL. While the initial steps you've made in programs like EOCL and LUNO are positive, they are very small relative to overall NRP and NGP budgets. We've seen significant strategic and operational mission value in what commercial industry can provide in conflicts around the world, including preparing for and deterring China. What strategic objectives and plans do you have in place to cultivate a strong domestic commercial industrial base, ensuring sufficient innovation and resilience for potential future conflicts?

Dr. MEINK. This response contains controlled or classified information. Member of office should contact committee staff to review.

Mr. CARBAJAL. We hear about "buy before you build" and "commercial first," and there are policies and presidential directives that provide similar guidance. There is a lot of rhetoric that seems to push towards leveraging commercial capabilities within the IC, yet when we examine the budget allocations and requirements aligned with commercial services, like the NRP (National Reconnaissance Program) and NGP (National Geospatial-Intelligence Program), the proportion is relatively small, even with the initial steps of EOCL (Electro-Optical Commercial Layer), Luno, etc.

The domestic commercial industry has also contributed significantly in terms of data and analytics that are particularly evident in missions like those in Ukraine and CENTCOM support, yet the current investment in leveraging and developing such solutions appears minimal. Could you elaborate on your plans to allocate resources more effectively to harness the proven benefits of greater commercial support and meet these policy and strategic objectives, fostering great innovation and enabling the unique capabilities that only the government can provide?

Ms. WILKERSON. The geospatial intelligence commercial industry is expanding and NGA will take advantage of that evolution. Today, NGA incorporates a wide range of commercial GEOINT ranging from greenhouse gas emissions and mining data to commercial computer vision to supply chain security. We are able to execute global climate security and economic monitoring efforts that would simply not be possible otherwise, while also more effectively allocating our analytic expertise and national resources to the most pressing intelligence and operational requirements.

Central to our efforts are our upcoming Luno contracts, the use of Commercial Solutions Opening (CSO) authorities, and NGA's increasing investment in these capabilities. These efforts will posture NGA to accommodate an increased demand signal from the DOD and intelligence community for commercial data and analytic services and encourage commercial industry to continue to innovate and provide increasingly viable commercial analytic capabilities in the future. More specifically, NGA will award the Luno A contract this year for unclassified, commercial GEOINT-derived computer vision and analytic services.

Combined with Luno B, for which we recently released a Request for Proposal, we will have a combined ceiling of \$490M. This is a 17-fold ceiling increase when compared to NGA's old commercial analytics contract for Economic Indicator Monitoring. Additionally, earlier this year, NGA announced the solicitation for our first-ever CSO, which will be focused on supporting frontline efforts against illegal, unreported, and unregulated fishing, illicit trafficking, and other activities which pose threats to global security.

NGA's continued investments in opportunities like Luno and CSOs strive to mitigate the historical barriers to entry by providing opportunities for the commercial sector to work with NGA to understand and answer our hardest requirements. We are asking industry to propose innovative solutions not currently available to solve one of our most difficult operational challenges, using commercial GEOINT to maintain shareability when working with international partners while preserving national resources for priorities that cannot be addressed by commercial. We believe this partnership with our commercial industry colleagues will unlock promising solutions to some of our customers' most challenging needs.

Mr. CARBAJAL. EOCL and Luno aside, how are your organizations continuing to give the commercial industry an opportunity to meet more and more of the traditional and legacy requirements that have previously been met by the government, especially when looking forward?

Ms. WILKERSON. NGA is continually working to increase opportunities for the commercial industry to meet traditional and legacy requirements for the community.

First, NGA continues to increase engagements with commercial GEOINT providers. The Commercial Operations team held 181 company engagements in FY23 and has already held 171 company engagements as of 3QFY24. These engagements provide industry partners a better understanding of NGA's needs and often result in bailment agreements which allow NGA to test commercial solutions in real world mission scenarios.

Second, NGA expanded outreach to National System for GEOINT partners about commercial capabilities. This provides the GEOINT community greater exposure to the potential offered by commercial solutions and allows them to participate in assessments of those capabilities.

Third, in addition to the Luno contracts, NGA has begun using Commercial Solutions Opening (CSO) authorities. In May 2024, we announced a new CSO opportunity, in partnership with the Defense Innovation Unit, to broaden maritime awareness globally. Selected vendors responding to this CSO will pitch their capabilities in early July 2024, and NGA hopes to select one or more awardees shortly thereafter.

Mr. CARBAJAL. While the initial steps you've made in programs like EOCL and LUNO are positive, they are very small relative to overall NRP and NGP budgets. We've seen significant strategic and operational mission value in what commercial industry can provide in conflicts around the world, including preparing for and deterring China. What strategic objectives and plans do you have in place to cultivate a strong domestic commercial industrial base, ensuring sufficient innovation and resilience for potential future conflicts?

Ms. WILKERSON. NGA has taken a multi-pronged approach to cultivating a strong domestic commercial industrial base. The agency will continue to maximize all opportunities and community partnerships, like the NRO innovation fund, to bring efficiency and innovation to each of our commercial acquisitions and sustain the most promising and impactful commercial capabilities.

First, we continue to expand formal partnerships between companies and NGA, leading to improvements in the technical solutions and capabilities the companies offer.

Since FY19, NGA has partnered in 43 bailment agreements with over 36 entities. The agreements allow rapid evaluation of a company's product while simultaneously providing valued insight into current commercial capabilities and mission needs.

Similarly, Cooperative Research and Development Agreements (CRADAs) offer low-risk, flexible opportunities for commercial companies, universities, and other nonfederal entities to engage with NGA on joint research and development projects. NGA has used CRADAs with several companies ranging from NUVIEW to Maxar Technologies.

Second, NGA is continuously communicating our needs while we seek commercial solutions that are not yet mature, helping industry understand our requirements and our interest. In August of 2024, NGA will host the first NSG Commercial GEOINT Conference, bringing together industry and government participants in a classified setting. Further, NGA released multiple requests for information/proposals for topics ranging from nonearth imaging to maritime domain awareness, providing industry the opportunity to offer their innovative solutions to meet our mission needs.

Finally, we are applying mature commercial solutions to real-world issues today, sending a critical demand signal that will lead to more industry investments and innovation.

For example, since the beginning of the Ukraine-Russia crisis, NGA has worked with commercial partners to increase collection over Ukraine's Area of Interest. In addition to sharing that commercial imagery with Ukraine upon collection, we added Commercial Synthetic Aperture Radar (SAR) collection, demonstrating the value of SAR in a region with difficult weather conditions. This clearly demonstrated to DOD, the IC, and commercial industry the scale and scope of the opportunities for commercial imagery and analytics and will continue to lead to industry innovation.

RESPONSE TO QUESTIONS SUBMITTED BY MR. WALTZ

Mr. WALTZ. I understand the space force is projecting that our launch sites will become a bottleneck in the next two years. Should the nation be investing in expanding our major launch site infrastructure, such as increase payload processing capacity, to ensure we can get all the necessary national security assets into space?

Dr. PLUMB. [No answer was available at the time of publication.]

Mr. WALTZ. An article just came out last week on China's Taijing-4 03 commercial satellite, which captured detailed radar images of the U.S. Navy's Naval Station Norfolk.

Since 2016, when the Chinese recognized its military organizations to increase its focus on space, China has deployed 950 satellites (according to a Pentagon report this last week) that are dual military and commercial use with over 470 of those as dedicated ISR platforms for intelligence, surveillance, and reconnaissance.

Are you concerned with how China's rapid deployment and leveraging of their commercial satellites? In response, how are we leveraging our commercial satellites as part of the Commercial Augmentation Space Reserve?

Dr. MEINK. This response contains controlled or classified information. Member of office should contact committee staff to review.

Mr. WALTZ. We recognize the satellites used to monitor the space environment are severely limited by the amount of fuel in their tanks.

Late last year, an NBC News article highlighted that, "China successfully tested the equivalent of a refueling tanker for satellites, a game-changing innovation that would enable Beijing to extend the life of satellites that would otherwise expire after running out of fuel."

I note the Space Force is asking for \$20 million in its 2025 budget request to start developing tools to handle a new mission set called "Servicing, Mobility, and Logistics" to address the satellite refueling concern.

Is DoD/SPACECOM developing its own "on-orbit" refueling operations or are there any commercial providers that the Service is working with to either provide or develop this capability? If China is already testing refueling capabilities on-orbit, how does this program enable us to refuel our own satellites? Is more funding around the corner in the future years defense plan? o What is your timeline to have this capability ready to go? o Does the budget request align with this timeline? o Do you have all the authorities you require to develop or contract these capabilities with commercial providers?

Dr. MEINK. This response contains controlled or classified information. Member of office should contact committee staff to review.

Mr. WALTZ. Tactically Responsive Space (TacRS) rapidly integrates and deploys space-based end-to-end capabilities in response to Combatant Commander urgent needs within a 24 hour response timeline. This could be for surveillance, reconnaissance and tracking, or special communications missions. I note that the FY25 budget request provides for \$30 million for RDT&E for this program. Are you able to comment on the number of missions conducted in FY24? o How many of those were conducted with commercial partners? o Is DoD/SPACECOM pleased with those results?

Dr. MEINK. This response contains controlled or classified information. Member of office should contact committee staff to review.

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Since 2016, when the Chinese recognized its military organizations to increase its focus on space, China has deployed 950 satellites (according to a Pentagon report this last week) that are dual military and commercial use with over 470 of those as dedicated ISR platforms for intelligence, surveillance, and reconnaissance.

Are you concerned with how China's rapid deployment and leveraging of their commercial satellites? In response, how are we leveraging our commercial satellites as part of the Commercial Augmentation Space Reserve?

Ms. WILKERSON. China is unquestionably fielding a broad suite of diverse imagery collection systems that offer the potential to significantly improve their situational awareness and ability to support military operations. While I am concerned by that potential, I note the more nuanced question - and difficult one to answer - is whether China is able to effectively task, exploit, and disseminate information from their growing constellation of satellites.

NGA has found great utility in commercial imagery and analytics, and we fully support the creation of a Commercial Augmentation Space Reserve (CASR). While the U.S. Space Force is best positioned to address your question about how commercial satellite systems might be integrated within the CASR framework, NGA is pos-

tured to manage and utilize data and services from CASR providers meeting specified U.S. Government security and interoperability standards during times of crisis or conflict.

