

[H.A.S.C. No. 115-88]

HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2019
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED FIFTEENTH CONGRESS
SECOND SESSION

SUBCOMMITTEE ON STRATEGIC FORCES HEARING
ON
**FISCAL YEAR 2019 BUDGET REQUEST FOR
NATIONAL SECURITY SPACE PROGRAMS**

HEARING HELD
MARCH 15, 2018



U.S. GOVERNMENT PUBLISHING OFFICE

29-492

WASHINGTON : 2019

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**FISCAL YEAR 2019 BUDGET REQUEST FOR NATIONAL
SECURITY SPACE PROGRAMS**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Thursday, March 15, 2018.

The subcommittee met, pursuant to call, at 4:30 p.m., in room 2118, Rayburn House Office Building, Hon. Mike Rogers (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. MIKE ROGERS, A REPRESENTATIVE FROM ALABAMA, CHAIRMAN, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. ROGERS. Good afternoon. I want to welcome everybody to this hearing of the Subcommittee on Strategic Forces and our hearing on the 2019 budget request for national security space programs.

Unfortunately, as everybody in the room now knows, we were interrupted by votes, and we are an hour behind starting off. So for the sake of not keeping you all here all night, I am going to submit my opening statement for the record, and the ranking member has told me that he is going to submit his opening statement for the record, too.

So we will go straight to your opening statements. And I would ask that each of you have 5 minutes. Your entire statement will be accepted into the record, so if you would just summarize it, we will get to questions and answers and finish this session and go to the classified section immediately after that.

So, with that, thank you all for being here. I know it takes a lot of time and energy to prepare for these things, but it really helps us. We really need to hear your thoughts at this time of year.

So, with that, I will recognize General Raymond.

Well, first let me recognize we have General Raymond with us today, Betty Sapp from NRO [National Reconnaissance Office], and the Honorable Kenneth Rapuano.

We will start with General Raymond for your opening statement. You are recognized.

[The prepared statement of Mr. Rogers can be found in the Appendix on page 19.]

**STATEMENT OF GEN JOHN W. RAYMOND, USAF, COMMANDER,
AIR FORCE SPACE COMMAND**

General RAYMOND. Thank you.

Chairman Rogers, Ranking Member Cooper, distinguished members of the subcommittee, I am honored to appear before this committee.

And this time it is my first time being able to testify in front of you in my dual hat as the Air Force Space Command commander and as the Joint Forces Space Component commander, a component of U.S. Strategic Command. I have the absolute distinct privilege of leading and representing both the Air Force and joint space personnel, who underpin successful global operations for our joint force and our Nation.

As I have stated previously, I am increasingly convinced that we are at a strategic inflection point and that we must accelerate our preparations to protect and defend against a conflict that begins in, or extends to, space, and that is exactly what we are doing.

Today's space capabilities are the foundation of power projection and fuel our joint force lethality. A high-end conflict may begin in our domain, which will require us to fight for space superiority.

As a component of United States Strategic Command, I would be remiss if I didn't echo the words of my boss, General Hyten, to say that our force is fully prepared to deter and, if necessary, to respond, and win, if deterrence were to fail.

As our National Security Strategy states, the United States considers unfettered access to and freedom to operate in space to be a vital interest. Our National Defense Strategy clearly articulates that the central challenge to the United States prosperity and security is the reemergence of long-term strategic competition.

Space is a warfighting domain, just like air, land, and sea. This budget is aligned with the National Defense Strategy to meet our warfighting imperatives necessary to compete, deter, and win. This budget marks a bold shift towards an increased focus on space superiority in a contested environment.

Specifically, we are enhancing our space situational awareness and our ability to command and control. We are shifting towards more defensible architectures. We are investing in tests and training infrastructure to further enhance our readiness. And, finally, we are enhancing our partnerships with the intelligence community, our allied partners, and the commercial space industry.

I thank you for your support, and I look forward to working with Congress as we continue to focus on our national security space posture.

I am privileged, absolutely privileged, to be here with my distinguished colleagues on the panel this afternoon, and I look forward to your questions. Thank you.

[The prepared statement of General Raymond can be found in the Appendix on page 21.]

Mr. ROGERS. Thank you, General.

The Chair now recognizes Betty Sapp, Director of the National Reconnaissance Office.

**STATEMENT OF HON. BETTY J. SAPP, DIRECTOR,
NATIONAL RECONNAISSANCE OFFICE**

Ms. SAPP. Thank you, Chairman Rogers, Ranking Member Cooper, and distinguished members of the committee. It was a great pleasure to host you and your committee members out at the NRO, and it is a great honor for me to be here today.

The NRO has a very clear and a very critical mission for the Nation: We provide the space-based ISR [intelligence, surveillance, and reconnaissance] capabilities necessary to assure the U.S. an information and operational advantage.

The NRO is structured for success. We are small and streamlined with end-to-end mission responsibility. We have enjoyed success in all aspects of that end-to-end mission. Our research and development team has developed and matured the next-generation technology necessary to stay ahead of changing targets and threats, fill current mission gaps, and develop new partnerships. Our acquisition teams are delivering the capabilities our users need on time and within budget.

In 2017, for the ninth consecutive year, we achieved a clean independent audit opinion, demonstrating our ability to properly manage and account for the resources entrusted to us. We had four successful launches last year, including our first on a SpaceX Falcon 9. Finally, and most importantly, we continued to deliver critical operational capabilities with a better than 99.7 percent reliability.

Our fiscal year 2019 budget request will build on the successful history of delivering innovative overhead intelligence systems for national security with the resilience required for the threat environment we face. We are specifically focused on investments that will deliver and assure the space-based capabilities we will need in a future fight: more resilience, more capability and capacity, and more speed.

Greater resilience continues to be a top priority. Processes and CONOPS [concept of operations] to protect our current on-orbit systems are being refined and tested, and our people are being trained to use them to full advantage. New systems will have resiliency features built in as an inherent part of their design.

In a future conflict, resilient space must backstop and work in concert with resilient air assets. Our investments focus on achieving the capacity and the capabilities required by the IC [intelligence community] and the DOD [Department of Defense]. We are increasing persistence in the “look rate” from space, reducing the gaps currently exploited by our adversaries.

Finally, we require more capacity and capabilities in space. They must be combined to deliver that critical information directly to warfighters at the tactical edge and in the fight, and it must be delivered when they need it. Enabled by advances in artificial intelligence, automatic target recognition, machine learning, and emerging technology, the NRO plans to do exactly that.

Everyone at the NRO is focused on our mission: delivering innovative overhead intelligence systems for national security. The current and projected threat environment doesn't change our mission, it just makes it more challenging. The men and women of the NRO are more than up to that challenge.

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

[The prepared statement of Ms. Sapp can be found in the Appendix on page 40.]

Mr. ROGERS. Thank you very much.

The Chair now recognizes Kenneth Rapuano, Assistant Secretary of Defense for Homeland Defense and Global Security.

You are recognized for 5 minutes. Thank you.

STATEMENT OF HON. KENNETH P. RAPUANO, ASSISTANT SECRETARY OF DEFENSE FOR HOMELAND DEFENSE AND GLOBAL SECURITY, DEPARTMENT OF DEFENSE

Secretary RAPUANO. Thank you, Chairman Rogers, Ranking Member Cooper, and distinguished members of the subcommittee. It is an honor to appear before you today along with General Jay Raymond, Commander of Air Force Space Command and the U.S. Strategic Command Joint Force Space Component commander, and Ms. Betty Sapp, Director of the National Reconnaissance Office.

Space is a warfighting domain, and just as in air, land, sea, and cyberspace, the Department of Defense must be prepared to address any and all threats to our national security. Space systems provide our joint force an unmatched ability to project power globally, respond to crises rapidly, strike swiftly and precisely, and command forces in multiple theaters of operation simultaneously.

Our National Security Strategy and the National Defense Strategy prominently recognize the criticality of space and acknowledge the potential for conflict to extend into space.

Our new National Defense Strategy [NDS] charts the course for how DOD will contribute to each of the National Security Strategy's four national interests. Under the new NDS, long-term strategic competition with China and Russia are the principal priorities for the Department. Addressing the challenges posed to our preeminence as a space power is fundamental to that effort.

Today's potential adversaries and competitors have studied how the U.S. joint force operates, and they are rapidly developing capabilities designed to challenge our freedom of action across all domains. Those potential adversaries view space as an area where they could weaken our advantage and cause cascading impacts on our sea, air, land, and cyber systems that rely on our space-based capabilities. Denial of U.S. space advantage is a key component of their strategy.

With this budget, the Department is making critical investments in capabilities necessary to protect and defend the space domain to ensure the mission to compete, deter, and win in the face of growing challenges.

The fiscal year 2019 budget request prioritizes activities to address the space threat and improves on the performance of our space systems. Our aim remains to deliver the space effects to enable the combat edge our Nation and our warfighters must have.

We also recognize the important need for the Department to be organized and structured most effectively to deliver on our duty to protect the Nation and its vital interests. The Department must accelerate, and is accelerating, its response to the changing dynamics of space.

The Deputy Secretary of Defense has heard Congress' concerns, and consistent with the NDAA [National Defense Authorization Act] for Fiscal Year 2018 has already taken action through interim implementation guidance and looks forward to completing the directed studies and changes that may be required.

The Department's partnership with Congress is and will remain absolutely critical to our success. To that end, I remain grateful for this subcommittee's strong support and interest in this vital area and its advocacy to dissuade aggression and establish a lethal force with the unmatched ability to prevail in, from, and through the ultimate high ground of space.

I look forward to your questions. Thank you.

[The prepared statement of Secretary Rapuano can be found in the Appendix on page 46.]

Mr. ROGERS. Thank you. I now recognize myself for questions.

General Raymond, the space launch industry is innovating in some pretty incredible ways that could increase capability and reduce costs, like moving toward reusable launch vehicles. Given all of this, how does the Air Force plan to integrate reusability into its launch program, and does the LSA [Launch Service Agreement] contemplate reusability?

General RAYMOND. Thank you, Congressman Rogers.

I have gone on the record in the past saying I fully support reusability. In my opinion, we would be stupid not to go down that path. It saves us money, and it will make sure that we do it smartly and that we will be able to launch effectively, but we fully intend to capitalize on the advantages that the U.S. industry has with reusability.

Mr. ROGERS. Great.

Mr. Rapuano, given President Trump's recent endorsement of the establishment of an independent space force, do you think the Department should implement that direction? Because it is consistent with what this committee and the House of Representatives has called for in the buildup to this last NDAA.

Secretary RAPUANO. Congressman, the President is very focused on outcomes. He has prioritized space, he has recognized the threats that have evolved and the pace at which they have evolved, and he recognizes it as a warfighting domain.

He also is very interested in ensuring that the Department is best organized and equipped to achieve our vital missions in space, and he is very interested in exploring any options that can provide that enhanced capabilities.

The Deputy Secretary, as you know, is leading the organizational and management review for the Department, consistent with the NDAA. Assessment of the space corps is one of those options that is getting close attention, among others. And he is going to be recommending that set of options that best ensures lasting U.S. leadership and success in space by 1 August, per the requirement.

Mr. ROGERS. Well, I agree, the President cares about outcomes. But I would ask you to go back and look at his exact words, and they were: We should have a space force; we will have a space force.

You are right, though, Deputy Secretary Shanahan is charged with trying to design that. I just was hoping you could show us a

little bit of what it might look like before he does it, but apparently that is not going to happen.

With that, General Raymond, yesterday in the full committee we had some testimony about how, if the Air Force really wanted to, while we are between where we are now and the establishment of this new space force, or space corps, whatever it is going to be, which will not be in the immediate future, the Air Force has a lot of challenges in dealing with the national security space and some of the threats that we face.

It was proposed yesterday in the hearing that if the Air Force really wanted to demonstrate that they get it and they are going to get after this, they would raise the profile of space in the Department and put a significantly larger amount of money against that challenge.

And I don't expect you to have the number today, but I would ask you to, at your earliest convenience, after you think about this a while, kind of get back to me and let me know what you think that number might be to enable you to have all the resources you need to get after the challenge fast.

General RAYMOND. I will be happy to do that.

I will tell you, I think the profile of space is pretty high in the Air Force. It is very high in the Air Force. This budget this year represents across the FYDP [Future Years Defense Program] an 18 percent increase, about a \$7 billion increase across the FYDP.

But I will be happy to put some thought on that. I have been focused on this budget. I will be happy to put some thought on that and come back to you.

Mr. ROGERS. Thank you very much, General.

And the Chair will now recognize my friend and colleague from Tennessee, Jim Cooper, for any questions he may have.

Mr. COOPER. Thank you, Mr. Chairman.

I welcome the stronger Air Force budget. But I will defer questions for the closed session, in view of the lateness of the hour and the excellent attendance by my Democratic colleagues. Thanks.

Mr. ROGERS. The Chair recognizes the gentleman from Colorado, Mr. Lamborn, for any questions he may have.

Mr. LAMBORN. Thank you. And I will have some questions for the closed hearing, but I have got a couple for right now. And I appreciate the conversations we have had recently.

The \$350 million in unfunded priorities. Now, as you told me earlier, there is a \$7 billion increase. However, we have to draw the line somewhere when we are doing budgets. But if you could have that extra \$350 million, what would we be able to get for that? And what are we losing by not having that?

General RAYMOND. Congressman, thanks for the question.

The way the Air Force did the unfunded priority list was, obviously, it is in its name, priority. So we have prioritized those activities that we couldn't fit into the budget, although \$7 billion is a significant increase for space and is really, as I mentioned in my opening comments, a bold shift towards warfighting and being able to protect and defend those assets in a contested domain.

But I will be happy to come back to you and talk specifically about the items that are in the unfunded priority list, but they give

Congress options in a priority order to help accelerate some of the things that we already have in the program.

Mr. LAMBORN. Okay. Well, we can continue that discussion.

I would also like to ask you about the increased need for space warfighting training. Now that everyone has recognized that space is contested and it is a warfighting domain, we need to have the personnel who have the training necessary to excel in that domain.

What are your thoughts on that?

General RAYMOND. It is a key focus area for us. I have been focused on that since the day I took command, the professional development and training.

We have made some pretty significant strides towards that end. We have implemented the Space Mission Force, which has allowed us to enhance the advanced training of our crews. We have implemented what we call Space Flags [exercises], analogous to Red Flags, to increase the focus of that as well.

And what I would suggest to you, it is not just about space training. It is about multi-domain training. And really what I am focusing on is making sure that we have space operators that are very smart in joint warfighting, and that we have joint warfighters that are also very smart in space, because it is that multi-domain collaboration and strength that is going to carry us to where we need to be in the future.

We also in this budget spent about approximately \$175 million to get after additional trainers, exercises, and war games.

Thank you.

Mr. LAMBORN. That is really good to see.

And, lastly, for any one of you, can we do a better job of partnering with the commercial sector, with private industry, to accomplish our goals? And, if so, how?

General RAYMOND. I don't want to monopolize this hearing, I will deflect, but I am passionate about this as well. We are working very closely with our commercial customers, and I think this will provide us significant advantage going forward.

One of the things that we have done on this budget, the Enterprise Space Battle Management Command and Control program is focused on building open standards in a consortium approach to energize and harness all of industry focusing on these issues. It is a key priority for us going forward, and you will see that reflected in our budget.

Mr. LAMBORN. That is great.

And either one of you.

Ms. SAPP. The NRO has always been about 95 percent of its budget in industry, on contract. So we have always been a close partner with industry today. And as new commercial providers are coming in, certainly we are looking at every way to team with them and leverage our capabilities.

Secretary RAPUANO. I would just add that this is a real intense focus of the Deputy Secretary of Defense, who is leading the reform efforts in the Department, obviously a big component focused on acquisition. And he is all about leveraging the commercial sector more effectively, and I think that we are going to be seeing a number of reforms in that area.

Mr. LAMBORN. Okay. These are excellent things. Thank you for the great work that you are doing.

Mr. Chairman, I yield back.

Mr. ROGERS. The gentleman yields back.

The Chair will pause for a little housekeeping that I overlooked at the beginning of the hearing.

We have two members of our full committee that are with us today that are not members of the subcommittee. I would like to ask unanimous consent that Mr. Moulton of Massachusetts and Ms. Bordallo of Guam sit in on this hearing and be able to participate.

Without objection, so ordered.

The Chair now recognizes Mr. Norcross from New Jersey.

Mr. NORCROSS. Thank you, Chairman.

General Raymond, you have had comments, as it started from this, how we are trying to get caught up and take advantage, whether it is private industry and others. The Air Force publicly says they want to move fast and get effective capabilities deployed, which is why section 1610 of the final NDAA for 2018 conference agrees, requires that the United States Air Force operationalize existing best-of-breed commercial space situational capabilities, but not later than May 30, 2018.

What is the plan to operationalize the best-of-breed commercial SSA [space situational awareness] capabilities by this required deadline? And this has been ongoing.

General RAYMOND. Yes, it has been. In fact, we leverage them pretty heavily today. If you look at the C2 [command and control] system that we have today, called the JSpOC [Joint Space Operations Center] Mission System, commercial capabilities are leveraged pretty significantly in that.

We also have stood up a capability in Colorado Springs, called Catalyst Campus, where we are bringing commercial applications in. The commercial companies can test them out there, and then we will roll them into our ops center to facilitate their integration into our operations.

And then, finally, as I mentioned earlier, in the Enterprise Space Battle Management Command and Control, what we are trying to do is not to have just one company be a winner and then to have a whole bunch of losers. We are trying to energize the entire industry by developing open standards and having a consortium-based approach where everybody can play.

And that is what we are doing. We will have a prototype done by 2021, and I am eager to get all of commercial industry wrapped around those standards.

Thank you.

Mr. NORCROSS. But let me follow up with that.

Then General Buck, commander of the Joint Forces Command, talked about this and said our capabilities were at a 3. Why are we not doing this quicker, not waiting for everybody to come onboard, but take advantage of what we have now, and then build up to that?

General RAYMOND. I must not have been clear. We are taking advantage now. We will continue to take advantage now. This is a future C2 system going forward that we are building the entire sys-

tem off of the commercial open standards. But we are leveraging those today, and will continue to leverage commercial industry hard as we look to fill some of the gaps that we have.

Mr. NORCROSS. I will wait for the closed session when we can get into it in a little bit more detail.

I yield back.

Mr. ROGERS. The gentleman yields back.

The Chair now recognizes the gentleman from Georgia, Mr. Hice.

Mr. HICE. Thank you, Mr. Chairman.

I am not sure exactly who this question goes to, and I do have some others for our closed session, but just a couple right now.

Does the DOD need to be more assertive about blocking potential acquisitions of U.S. companies by China in the space industry in ensuring security here?

Secretary RAPUANO. Congressman, that is a key issue. Thank you for raising it.

This is an issue that both the Secretary and the Deputy Secretary have raised, looking at supply chain, looking at the implications of foreign ownership or investment in capabilities that are critical or essential to national security.

I believe you are familiar with the CFIUS [Committee on Foreign Investment in the United States] process in which these types of transactions are assessed by an interagency committee, accessing intelligence and other sources of information to make assessments on the relative risk associated with these transactions.

So I think that we are definitely focused within the Department on the ways in which adversaries can all too easily acquire capabilities or knowledge that they could use against us, and we are actively involved in that process.

Mr. HICE. I am really glad to hear that.

So are you saying then that the DOD is responsible or authorized to block these kinds of acquisitions?

Secretary RAPUANO. The DOD is involved in the interagency process that makes conclusions on transactions that are concerning and then rise to the CFIUS process.

Mr. HICE. So they have significant influence in the decision?

Secretary RAPUANO. We are a pretty significant voter in the process.

Mr. HICE. Great. One other quick question, then I will defer my other questions.

During a Red Flag event, or some other kind of training event, are these services taking into account the possibility of a partial loss of our satellite communications?

General RAYMOND. Absolutely. We embed our space operators into those exercises. The Space Flag exercise that we also stood up complements that. But we exercise that routinely.

Mr. HICE. Okay. Great. So are any of your offices, or all of your offices, involved in crafting those type training exercises?

General RAYMOND. Sir, that falls under my responsibility to organize, train, and equip at Air Force Space Command. We work that routinely.

Mr. HICE. Okay. Very good.

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

Mr. ROGERS. The Chair now recognizes the gentleman from Washington State, Mr. Larsen, for 5 minutes.

Mr. LARSEN. Thank you, Mr. Chairman. I would like to yield my time to Mr. Moulton from Massachusetts.

Mr. ROGERS. The gentleman yields to Mr. Moulton from Massachusetts. The gentleman from Massachusetts is recognized for 5 minutes.

Mr. MOULTON. Thank you, Mr. Larsen.

Thank you, Mr. Chairman.

General Raymond, China has successfully conducted test launches of several effective anti-satellite missiles, ostensibly able to destroy U.S. satellites. This development fundamentally alters the strategic balance between great powers, and it has continued to evolve in favor of China, which has accelerated development of space weapons.

Public reports indicate China would be able to destroy a staggering number of U.S. satellites in the opening days of a potential conflict, thereby disabling many of the capabilities we have come to rely on in the United States military—GPS [Global Positioning System], surveillance, targeting, communications, and more.

I will be following up on this in the classified setting, but can you just give us an overview of what our strategy is to counter those capabilities? And echoing some of the other questions we have heard from the committee, are we really committing enough resources to this development that could truly fundamentally alter the strategic balance?

I would add that Ms. Sapp talked about the development of AI [artificial intelligence] as one of the things that we are investing in. I mean, China has made a commitment to be the world's leader in AI by 2030. You have never heard such a commitment from us.

I am just concerned that we are falling behind and this is a place where, because of the strategic implications, we clearly have to lead.

General RAYMOND. Space is a warfighting domain, just like air, land, and sea, and it has become very contested, as you talked about, everything from low-end reversible jamming to the high-end direct ascent ASAT [anti-satellite weapon] that was demonstrated in 2007, which you highlighted in your question.

One of the things is we have a strategy, and really it is a strategy that we share between the NRO and the Department of Defense. We have a vision. We took that vision and we wrapped an operational concept around it, called the space warfighting CON-OPS. We have trained and exercised for that, and there are several lines of effort that we are doing.

Again, if you are responsible for operations in the warfighting domain, you have to have the ability to have domain awareness, SSA, so we are enhancing that in this budget.

You have to have the ability to command and control, and so we are invested significantly in our command and control capabilities.

You have to have defendable architectures, and in this budget we have made a significant shift towards having those architectures that we are able to defend.

You have to have partnerships, just like we have in all other aspects of joint warfare.

Mr. MOULTON. If I may interrupt, that all sounds wonderful. But the question really is, are those investments significant enough? Are they significant enough to compete with our great power adversaries, who have really stuck their flag in the sand and said, "This is where we will be in 2020 and 2030"?

General RAYMOND. So my view is that we still have the best space capabilities in the world, operated by the best airmen. We have competitors that are moving very quick, and we need to pick up the pace to stay ahead of that threat.

I am comfortable that the \$7 billion that we have invested across this FYDP is going to shift and provide us the capabilities that we need to stay ahead of that threat as we continue down the path.

Mr. MOULTON. Director Sapp or Assistant Secretary Rapuano, would you like to add to that?

Ms. SAPP. I will just agree with General Raymond that I think we have not only plans, but programs in place to defend against the weapons you are talking about. I think we could give you some more detail in the classified follow-on.

I would also mention that we have been working automated intelligence, automated target recognition for quite some time and have made real progress. In fact, it is in operations today.

Secretary RAPUANO. I think it is well covered by General Raymond and Director Sapp. And just to reiterate, the emphasis is that we are going to be able to prevail in all of those domains critical to our national security in achieving our objectives.

Mr. MOULTON. Thank you.

Thank you very much, Mr. Larsen.

Mr. Chairman, thank you.

Mr. ROGERS. The gentleman yields back.

The Chair now recognizes the gentleman from Colorado, Mr. Coffman, for 5 minutes.

Mr. COFFMAN. Mr. Chairman, I will follow up with these questions in the classified setting, as well.

General Raymond, it is my understanding that the traditional Evolved Expendable Launch Vehicle, EELV, providers are contracted under Federal Acquisition Regulations, the FAR, 15, while new entrants are contracted under FAR 12. It is also my understanding that FAR 12 is a more commercial way of doing business than FAR 15.

Could you explain the difference in procuring launch services using FAR 12 versus FAR 15? And does DOD have the same insight on cost, as well as oversight on mission assurance, when using both of these contracting methods, or is one more stringent than the other?

General RAYMOND. Congressman, first of all, it is good to see you. I am going to take that for the record. I am not an acquisition background guy, and I just don't know the answer to your question. So I will be happy to take it back and talk to our acquisition professionals and get you an answer.

[The information referred to was not available at the time of printing.]

Mr. COFFMAN. Okay.

At the hearing yesterday, General Raymond, about space war-fighting readiness, the panelists made it quite clear that our Na-

tion's space warfighting construct must adapt to the threats we face today and in the future. It is evident that the Air Force recognizes this.

However, the new start program to SBIRS [space-based infrared system], the Next-Generation Overhead Persistent Infrared, is not clear. As the panelists put it, "It is not clear how the alternative is substantially a different approach," unquote. Quote, "The budget request is not more resilient," unquote. And, quote, "Disaggregating does not necessarily improve missions or deterrence," unquote.

Could you comment on that?

General RAYMOND. I will be happy to comment on it.

It is more resilient. In fact, the NDAA required STRATCOM [U.S. Strategic Command] and SSDP [Space Security and Defense Program] to do an assessment of that. They have done that. And I will be happy to talk to you more in the closed session about it.

Mr. COFFMAN. Okay.

Mr. Chairman, I yield back.

Mr. ROGERS. The gentleman yields back.

The Chair now recognizes the gentleman from California, Mr. Garamendi, for 5 minutes.

Mr. GARAMENDI. I will pass and hopefully get to the classified ASAP [as soon as possible].

Mr. ROGERS. We have no further Republicans.

The Chair now recognizes the gentlewoman from Guam, Ms. Bordallo.

Ms. BORDALLO. Thank you very much, Mr. Chairman.

And thank you to our witnesses for being here today.

General Raymond, there is an urgent need to rapidly reconstitute and replenish critical space capabilities to preserve continuity of operations capability. So can you speak to some of the investments in low-cost responsive launch options that you would recommend the Department pursue to fulfill this need?

General RAYMOND. Thank you. And it is great to see you again.

We have invested in this budget pretty significantly in small launch options. I think it is really important, as you said, for replenishment.

We have gone through a period of this before. We did this in the early 1990s when we first launched satellites called Iridium, where there is a large constellation of smaller satellites, and there were a lot of companies that were being developed to do the replenishment launches.

As you look to new space and constellations that are going to be of significant size, I think it is going to be important, and we have invested in that in this budget.

Ms. BORDALLO. All right. This next question is important to me, and I guess any of you could answer, if you could.

Today, nearly all U.S. national security satellites are launched from fixed coastal U.S. launch sites that could easily be disrupted. These fixed sites also provide predictable locations from which adversaries could get clues to discern U.S. capabilities.

Is the Department of Defense developing more launch sites using new commercial capabilities to address these weaknesses and support a rapid, responsive, and resilient launch capability?

I am a Representative from Guam, and I will say here that there have been inquiries about space capabilities in our territory from commercial investors. Very recent were these visits, and they are very ambitious to begin operations.

So could any of you comment on this?

General RAYMOND. Yes. There are commercial launch sites that are available today. We have got them. On our fixed bases, we have commercial sites. We also have different space ports in New Mexico, in Alaska, in Florida, and in Virginia. So there are multiple space ports.

Ms. BORDALLO. Is Guam on the list, General?

General RAYMOND. We would be happy to put Guam on the list, because I think it is important. I think resiliency is important.

I will say, one of the big things that has happened over the course of the last year, which is significant, and it doesn't get a lot of press, and that is the move to autonomous flight termination systems in the autonomous ranges.

So today every time SpaceX does a launch, they do it autonomously. So we have to have the ability to protect populations. You have to have the ability to blow up a rocket if it were to go astray. We typically have radars and telemetry dishes and command destruct antennas and a bunch of contractors working that.

Today with SpaceX, when they launch, it is all done autonomously. That helps reduce the range infrastructure and make these, in my opinion, a more resilient capability going forward.

Ms. BORDALLO. Are there any other comments from the other witnesses? Are you aware of the inquiries that have been made to Guam? They have been to Guam to look at, of course, our Andersen Air Force Base and the Guam International Airport. So is anyone aware of that?

Ms. SAPP. Some of the commercial launch providers are going to do their own assessment as to what makes sense for their business, and we are going to use those commercial launch providers. So we are going to go where they end up going.

Ms. BORDALLO. Well, they were very interested in Andersen Air Force Base, so I just thought maybe.

So I have no further questions, and I yield back, Mr. Chairman.

Mr. ROGERS. The gentlewoman yields back.

Seeing no further questions, we will—oh, he showed up. Slipped out on me and came back.

The Chair now recognizes the gentleman from the great State of Alabama, Mr. Byrne, for any questions he may have.

Mr. BYRNE. Mr. Chairman, I did show up. I am glad you noticed.

General, I hate to keep you for a few more minutes, but my questions really pertain to personnel. A lot of times when we talk about space we like to get talking about the technological stuff, but it is the people, as you know better than I do, that matter.

Do you think you have the proper number of service members to do this? Do you believe you are efficiently manned to shift from a peacetime operational tempo to a warfighting one? And are we effectively utilizing the skills of these service members to capitalize on their talents?

General RAYMOND. First of all, thank you for the question. And it gives me a chance to brag on the airmen that I am privileged

to lead. We have got the world's finest airmen, and they are doing spectacular work for our Nation and our joint force.

The Air Force has more mission than it does resources. And so, as part of that larger issue, looking forward to a contested environment, I do think there is room for growth.

In fact, the Secretary of the Air Force and Chief of Staff of the Air Force have tasked me to conduct a study, which we are doing as we speak, to look at the structure, the size, the scope, the scale, the professional development aspects of those airmen, and I will report back to them this summer.

Mr. BYRNE. Do you think that you can shift, with your present number, from a peacetime scenario to a wartime scenario? Would you have to have an increase to do that?

General RAYMOND. We operate 24/7, 365. It is global operations all the time. I am very comfortable that I have got the capabilities that I need today.

Mr. BYRNE. Okay. And you would be unusual if you weren't like everything else in the private sector, or in the public sector, and that is the rapidly changing need for skills development, because technology is moving so fast.

Do you feel like you have got the resources you need to continually provide the skills training these folks need?

General RAYMOND. I do. And as I mentioned, one of my big priorities for the command is professional development and developing operators to be able to operate in this contested environment. We have completely transformed how we train our operators. In this budget we, again, have invested in—I think you might have been out—\$175 million in training infrastructure to be able to get after the challenges that we currently face.

Mr. BYRNE. Well, I am a strong supporter for what you are doing. I ran the workforce training system in Alabama, and you know what we are doing in Huntsville and at Maxwell Air Force Base. And keeping the civilian folks coming into that was part of my portfolio, and I was amazed at how rapidly things were moving.

And I just know that you have got that on steroids. And I just want to express my support for what you are doing. And if you think you need more resources or help from us, please let us know.

General RAYMOND. I really appreciate your support. Thank you.

Mr. BYRNE. Thank you.

I yield back.

Mr. ROGERS. The gentleman yields back.

We will now go into recess and reconvene in the SCIF [Secure Compartmented Information Facility] in about 10 minutes.

[Whereupon, at 5:10 p.m., the subcommittee proceeded in closed session.]

A P P E N D I X

MARCH 15, 2018

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 15, 2018

Opening Statement of Hon. Mike Rogers
Hearing on
Fiscal Year 2019 Budget Request for National Security Space Programs
Thursday March 15, 2018

Good afternoon, welcome to the Subcommittee on Strategic Forces hearing on the Fiscal Year 2019 Budget Request for National Security Space Programs. This hearing could not have come at a better time.

Space is a warfighting domain and now that everyone agrees on that we must turn our efforts towards setting up our forces for success.

We have to develop the culture, the processes, and training needed to continue to outpace our strategic competitors to preserve our national security.

I am so excited to have the support of President Trump as we work towards this goal and look forward to making it a reality in the near future.

We have the privilege today of hearing from three of the Nation's top leaders in our military and intelligence space enterprise.

General John "Jay" Raymond
Commander, Air Force Space Command and Commander of Joint Forces
Space Component Command at U.S. Strategic Command

Ms. Betty Sapp
Director, National Reconnaissance Office

The Honorable Kenneth P. Rapuano
Assistant Secretary of Defense for Homeland Defense and Global Security.

Thank you all for appearing before us today and for your continued service to our nation.

As you might have heard on Tuesday afternoon during a speech in California President Trump endorsed the formation of an independent space force, outside the Air Force, just like the Army and Navy.

I look forward to working with the Administration in achieving this goal in the near future.

This initiative, that I began in earnest last year, was never about personalities or individuals. It was rooted in the very real acknowledgement of the threat posed by our strategic competitors in the warfighting domain of space.

As we work to ensure that our joint space warfighters are ready and able to fight and win in this domain it is important that we continue to hold the Department and specifically the Air Force accountable for presenting a budget that enables this transition.

Like they say in Alabama—if you can't roll with the big dogs you should stay on the front porch.

It is through this lens of space warfighting and reorganization that I am assessing this year's national security space budget.

And my initial assessment of it is mixed.

I'm glad to see major decisions were made in our most important satellite constellations to move towards more resilient architectures.

The shift from procuring the current GPS III and SBIRS platforms to developing a more resilient next generation architecture for both, is an interesting idea worth consideration.

However, I still have concerns about the Air Force's ability to move quickly here and get the space segment, ground segment, and terminals all delivered on time and on schedule.

I also remain concerned about the prioritization of space programs across the DoD and within the Air Force.

If you look up on the screens, we have a couple charts that compare space funding between FY18 and FY19.

The combined procurement and R&D accounts for Space programs actually saw an overall decrease of about \$500 million from the FY18 levels.

We didn't make these numbers up – these are straight from the Comptroller's budget documents.

And when we got the Air Force's unfunded priorities list for FY19, I counted 10 different space programs on it, asking for over \$350 million in funding.

That's really my biggest frustration. We've heard Air Force leaders talk about the increasing threats we face in space and declare that space is a priority mission for the Air Force.

Yet, when the rubber meets the road, we see space programs given a backseat behind other Air Force programs. I didn't see a lot of air dominance programs on that unfunded list.

Given the President's remarks on Tuesday afternoon, I anticipate that the Department will accelerate its plans to embrace the formation of an independent space force.

And I look forward to working with the Administration in realizing this goal so that our joint warfighters in all domains—air, space, cyber, ground, and maritime—are the best equipped, most lethal, and most effective force in the world.

With that, I'll turn it over to my friend and colleague from Tennessee, Mr. Jim Cooper for his opening comments.

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SUBCOMMITTEE ON STRATEGIC FORCES
HOUSE ARMED SERVICES COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE
SUBCOMMITTEE ON STRATEGIC FORCES
HOUSE ARMED SERVICES COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

SUBJECT: Fiscal Year 2019 Priorities and Posture of the National Security Space Enterprise

STATEMENT OF: General John W. Raymond
Commander, Air Force Space Command
Joint Force Space Component Commander

March 15, 2018

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SUBCOMMITTEE ON STRATEGIC FORCES
HOUSE ARMED SERVICES COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

INTRODUCTION

Chairman Rogers, Ranking Member Cooper and distinguished Members of the Committee, I'm honored to appear before this committee for the first time in my dual capacity as Commander of Air Force Space Command (AFSPC) and U.S. Strategic Command's Joint Force Space Component Commander (JFSCC). I have the distinct privilege to lead and represent the 36,000 dedicated men and women of AFSPC, and the joint space personnel under JFSCC command and control, who underpin successful operations for our joint force and the Nation. Since my last testimony before Congress, I have traveled throughout the command and discussed national security trends with our Airmen, the joint force, the Intelligence Community, and national leadership. From these discussions, I am firmly convinced we must aggressively accelerate our preparations to protect and defend against a conflict that begins or extends into space. Our goal is to deter conflict from extending to space, but should deterrence fail, we must be prepared to win.

Our National Security Strategy states that unfettered access and freedom to operate in space are vital interests of the United States. This year's National Defense Strategy clearly articulates the ill intent of revisionist powers, rogue regimes and non-state actors, and states that the central challenge to security and prosperity is the return of long-term, great-power competition. We must view this challenge in the context of a highly complex strategic environment with threats that are both multi-functional and multi-domain. Different from the past, potential adversaries are rapidly developing and fielding a diverse and capable range of counter-space capabilities able to hold our space systems at risk, on orbit, in cyberspace, and from the air, land, and maritime domains. They are also advancing their own space capabilities and desire to reduce the U.S. historical advantages of power projection, speed, precision, and global awareness. Today, space is a warfighting domain just like air, land and sea.

For over 35 years, AFSPC has made profound contributions to our Air Force and the Nation; we proudly remain at the vanguard of the American way of war – ensuring Global Vigilance, Global Reach, and Global Power. Consistent with the National Security Strategy and the National Defense Strategy, the fiscal year 2019 budget marks a bold pivot to warfighting. Our efforts in this budget also focus on three priorities: restore military readiness, strengthen alliances and attract new partners, and bring business reforms to national security space.

RESTORE MILITARY READINESS

AFSPC is posturing for a potential future conflict and is becoming a more combat ready force to deter the aggression of potential adversaries. In fiscal year 2018, the Air Force presented a budget that reflected a 20 percent increase in investment accounts from the previous fiscal year. That budget was an important first step in ensuring our unprecedented access to and freedom of action in space and the normalization of space as a warfighting domain. The fiscal year 2018 budget also sets the foundation for the type of resilient space enterprise necessary to operate in a contested domain. We laid the groundwork for protecting and defending space assets by transitioning the National Space Defense Center to an initial operational status, re-baselining our space situational awareness (SSA) enterprise to begin to provide indications and warning for possible threats, and training a Space Mission Force focused on a fight that extends to space. The fiscal year 2019 budget request is the next step in revolutionizing how we operate in space. Continuing to build a resilient and defensible architecture that seeks first to deter adversary aggression, then fight and win if deterrence fails. To that end, the Air Force has heavily adjusted our future years defense plan (FYDP) investment dollars (procurement and RDT&E), seeing a nearly \$7 billion adjustment in investment, an 18 percent increase across the FYDP. This builds upon the fiscal year 2018 gains, shifts to a new investment strategy, and is a testament to an Air Force and whole-of-government approach that recognizes how important it is that we get this right.

Joint Force Space Component Commander

On 1 December 2017, U.S. Strategic Command (USSTRATCOM) re-organized its space forces, elevating the senior commander responsible for joint space operations from the three-star Commander, Joint Functional Component Command for Space to a four-star general officer. This new structure dual-hats the AFSPC Commander with the elevated operational command role, known as the JFSCC. While the title change may seem minor, the organizational change is significant. It helps normalize USSTRATCOM's command structure and relationships with other U.S. Combatant Commands, and combines the warfighting commander of joint space forces with the commander responsible for organizing, training, and equipping of Air Force Space Forces.

The USSTRATCOM Commander's operational end state is to improve warfighting effectiveness against agile, versatile, and ever-adapting adversaries through an organizational

restructure of space forces, which fosters mission command, promotes unity of effort with mission partners, improves USSTRATCOM's posture as a global warfighting command, and better postures the joint force to gain and maintain space superiority. Ultimately, the establishment of the JFSCC better focuses joint space forces on protecting and defending U.S. space assets and will ensure joint space forces are able to provide theater and global effects from space.

The National Space Defense Center (NSDC)

The NSDC is a Department of Defense and Intelligence Community partnership organization that focuses and improves our nation's ability to rapidly detect, characterize, attribute, warn and defend against threats to our nation's vital space systems. The NSDC directly supports space defense unity of effort and expands information sharing in space defense operations among the Department of Defense, National Reconnaissance Office (NRO), Intelligence Community and other interagency partners. A critical step to achieving this was transitioning the NSDC from experimental status to 24/7 operations on 8 January 2018. The NSDC is beginning to address the joint force's requirement to deliver multi-domain effects in defense of U.S. space capabilities. Additionally, this transition bolsters the ability to protect and defend the national security space enterprise and the delivery of space capabilities to U.S. leadership, the joint warfighter, and coalition partners. This organization has immediately improved our space situational awareness and improved our readiness, both of which are absolutely critical to maintaining space superiority.

Space Flag

In 2017, AFSPC conducted the first two Space Flag exercises. These advanced training events allowed operational crews and supporting intelligence personnel to rehearse operations in a realistic contested environment. Using personnel from the Air Force's Space Aggressor Squadron – a unit of specially trained and equipped Airmen from the USAF Warfare Center stationed at Schriever AFB, Colorado who emulate hostile forces – crews gained valuable experience operating their systems against “trained adversaries” to ensure critical space capabilities remain available to support joint operations. These events were the result of partnering with Air Combat Command and industry partners, and are now a key element of combat readiness for the Space Mission Force. Although initial training objectives were limited, AFSPC will use this venue to vastly expand advanced space warfighting training going forward.

Air Force Space Command Three-star Vice Commander

The Air Force directed the establishment of a three-star Vice Commander of AFSPC who will be located in the national capital region and report directly to the AFSPC Commander. This position will be responsible for assisting me with my responsibility to organize, train and equip Air Force space forces and working with Headquarters Air Force to ensure effective corporate advocacy for, and stewardship of, Air Force space missions and capabilities. Responsibilities of this position will also include the integrating and synchronizing of operations, policy, guidance, plans, strategy and requirements of AFSPC efforts with Headquarters Air Force, the Intelligence Community, the Joint Staff, the Office of the Secretary of Defense, and other agencies. Finally, this leadership position will represent the AFSPC Commander in daily interactions in the national capital region.

STRENGTHEN ALLIANCES AND ATTRACT NEW PARTNERS

With the strong support of the Secretary of Defense and the Department of the Air Force, AFSPC has made progress towards a goal of expanding both commercial, interagency, and international partnerships in 2017. Partnership and cooperative operations with the Intelligence Community are at an all-time high with the NSDC as a prime example of how we are committed to growing these relationships further. We recognize it is impossible to accomplish our mission alone and must continually work toward leveraging and enhancing all relationships in every area that enhances our position in the space domain.

Growing Commercial Partnerships

Commercial partnership and collaboration is vitally important to the AFSPC's ability to succeed in our mission and more importantly, move forward in a manner that outpaces our strategic competitors. In response to the increasingly contested space environment, Congress has asked the Air Force to examine commercial solutions to rapidly fill critical operational gaps and mitigate emerging threats. In a January 2018 report to Congress, the Air Force highlighted fiscal year 2018 budget inclusions of commercial capabilities when making content decisions on space surveillance sensor systems, space situational awareness software for operations, and battle management command and control software for operations centers.

Included in that report is the Air Force pursuit of the development and integration of commercially available space capabilities through the implementation of the Commercially Augmented Mission Operations concept located at the Catalyst Campus in Colorado Springs,

Colorado. With \$5 million in fiscal year 2018 funding, this effort will provide a common and collaborative commercial demonstration, modeling and simulation, and operations environment. Ultimately, it will serve as a venue to assess the national security utility for commercial capabilities across multiple security classification levels. Through multiple lines of effort, the Air Force will pursue funding for commercially available tools to support the myriad of activities that enhance maturation of critical battle management command and control technologies.

Under the direction of the Space and Missile Systems Center (SMC), we have awarded an Other Transaction Agreement to establish the Space Enterprise Consortium (SpEC), managed by Advanced Technology International (ATI). This consortium enhances our ability to develop the most relevant space-related technologies at every stage of the acquisition process and facilitate the introduction of timely solutions to today's space challenges. SpEC will be made up of large and small businesses representing traditional and non-traditional defense contractors. The SpEC mission will include performing research, development, test and evaluation within prototyping projects that address Department of Defense requirements for space systems. Since the award to ATI, SpEC has over 100 members to date with over two thirds being small businesses or non-traditional defense contractors. In January 2018, two prototype solicitations were released to the consortium with an expected award date at the end of March 2018. Four additional prototype solicitation releases are planned over the next several months.

Joint Space Operations Center to Combined Space Operations Center

The Joint Space Operations Center at Vandenberg Air Force Base, California is the operations center responsible for integrating space effects, like missile warning and positioning, navigation and timing, into joint operations worldwide. Within the Joint Space Operations Center (JSpOC) we have expanded the Commercial Integration Cell (CIC) designed to allow satellite operators from commercial companies to sit alongside military personnel. Currently, the CIC consists of representatives from seven commercial partners (DigitalGlobe, Intelsat, Eutelsat, SES Government Solutions, Iridium, Xtar, and Inmarsat) who will interface and exchange data directly from the JSpOC Operations Floor. Its objective is to enhance the JSpOC commander's situational awareness of the space domain and develop tactics and procedures for combined operations to achieve better integration between commercial satellite operators and the warfighter. In March 2018, we plan to submit requests to electronically connect each of the partners' operations centers on classified networks to enable real-time communications for the

purpose of coordination and deconfliction. The next phase of the CIC transitions its management into a commercial consortium.

The JSpOC will transition to a Combined Space Operations Center this year to fully integrate current and future coalition partners at Vandenberg AFB, California. The CSpOC will build on present participation from the UK, Australia and Canada to improve combined space operations resiliency. This is now as critical in space as it always has been in other domains.

Multi-National Space Collaboration

Along with the CSpOC transition, we are expanding the USSTRATCOM Multi-National Space Collaboration (MSC) initiative. Established in 2017, the MSC is a construct that supports cooperation and relationship building with our allies, focusing on current space operations requirements, space situational awareness, and other future mission requirements. In the summer of 2017, the MSC gained representation from the German Air Force. We expect the addition of representatives from France and the United Kingdom in 2018 and have also extended invitations to Italy, Japan, Spain, the Republic of Korea, New Zealand and Australia. Canada will support the MSC with personnel already assigned to the Joint Space Operations Center.

Enhanced Polar System - Recapitalization

Further examples of international cooperation include a Department of Defense partnership with the Norway Ministry of Defence to host U.S. protected Satellite Communications (SATCOM) payloads in polar orbit. The Enhanced Polar System – Recapitalization (EPS-R) is the protected SATCOM follow-on to the EPS providing a 24/7 protected SATCOM capability to the North Polar Region. This cooperative strategy that hosts U.S. payloads on Space Norway satellites saves the U.S. \$900 million as compared to building, launching, and operating free-flying spacecraft. The EPS payloads on two separate Space Norway spacecraft are scheduled for a dual launch in fiscal year 2023.

Wideband Global Satellite Communications Partnerships

In March 2017, the Air Force launched the ninth Wideband Global SATCOM (WGS) satellite, and USSTRATCOM later accepted it into operations. The WGS-9 satellite provides military forces and international partners with enhanced communication capabilities and extends coverage of the WGS constellation. Australia became the first international participant in the WGS system under a cooperative agreement with the Air Force in 2007. Since then, this system represents a broader international partnership, as five partner nations provided funding for WGS-

9: Canada, Denmark, Netherlands, Luxembourg, and New Zealand. The Czech Republic and Norway have since been added as partners on WGS. In return for funding, partner nations receive access to the WGS constellation.

Space Surveillance Network Expansion to Australia

On 7 March 2017, the U.S. and Australia Defense Departments declared full operational capability of the AFSPC C-band radar at the Harold E. Holt Naval Communications Station, Exmouth, Western Australia. The C-band radar, in a critical geographic location, extends the reach of the U.S. Space Surveillance Network (SSN) deep into the southern hemisphere, improving our ability to track and characterize objects in that region of space. The C-band radar system is an AFSPC-owned, dedicated sensor in the SSN; however, operations and level-one maintenance are being performed by the Australian Department of Defence.

Schriever Wargame

AFSPC annually conducts the Schriever Wargame, a scenario-based wargame designed to drive international cooperation along with future operational and investment planning for space and cyber. In 2017 the Schriever Wargame included the United States' Five-Eye partners (Australia, Canada, Great Britain and New Zealand), along with France and Germany. In 2018 we will expand the Wargame to also include Japan for the first time.

Partnerships promote peace and cooperation, economic growth, and are an anchor of deterrence against potentially aggressive states. More specifically, partnerships promote coalitions and coalitions are how we fight in every other domain. Space will be no different.

BRING BUSINESS REFORMS TO NATIONAL SECURITY SPACE

Delays in fielding capabilities that are designed to operate in today's space warfighting domain erode U.S. warfighting advantages and put our forces at risk. Critical to our ability to rapidly move forward is a simpler and more responsive requirements and procurement process. Warfighters and acquisition personnel must partner to meet the speed of operational needs while still developing war winning capabilities. It is imperative that acquisition risk decisions are balanced with the urgency of the operational need and demands that we take full advantage of the authorities at our disposal, and use alternative acquisition approaches such as Other Transaction Authorities and drive Milestone Decision Authority (MDA) and other acquisition decisions to the lowest practical level. Changing from today's highly risk-averse acquisition culture to this new mindset is critical, and will take leadership involvement; my leadership team

and I are personally engaged. Our world-class acquirers will field advanced warfighting capabilities on timelines that ensure we stay ahead of the threat.

AFSPC is shifting the order of precedence for operational requirements. In the post-cold war benign domain of space, availability and reliability were priority criteria for U.S. space system development. In today's increasingly contested environment, the priority is now survivability and outpacing the threat.

Acquisition Reforms for National Security Space Assets

We are taking advantage of congressional authorities and have worked with the Department of Defense staff to return other program decision authorities back to the Air Force, including 14 of the 19 Major Defense Acquisition Programs within the space portfolio. This is projected to reduce decision cycle time by 4-6 months. Also, using tools such as the Defense Acquisition Workforce Development Fund, we are investing in our people, ensuring they have the right skills and training to succeed.

Additionally, AFSPC's acquisition arm, the Space and Missile Systems Center, has begun to reform their processes with an emphasis toward speed. Lieutenant General John Thompson, the Program Executive Officer (PEO) for Space Systems and SMC Commander, has delegated MDA for all Acquisition Category (ACAT)-III programs (16 programs – 37 percent of the PEO-Space portfolio), from his office down to the program director level. This is forecasted to reduce decision cycle time by 1-2 months for each milestone decision. SMC has also reduced the amount of time it takes to award a contract by approximately 52 percent, from 769 days (2016) to 372 days (2017).

In 2017 SMC used the expanded Other Transaction Authority granted by the Fiscal Year 2016 NDAA to award an innovative prototyping agreement – the Space Enterprise Consortium (SpEC). This umbrella agreement, with a multitude of companies enables SMC to rapidly prototype space systems for the next five years. This saves time over the traditional process of awarding multiple prototype contracts, and allows the government to obtain solutions from non-traditional contractors, or those who do not have the overhead necessary to manage traditional Department of Defense contracts. Since award of the Consortium Manager Role in November 2017, SpEC Other Transaction released two prototype solicitations in January 2018. The plan is to award prototypes by the end of March 2018 and release four additional solicitations over the next several months. One of two prototypes being awarded is for the Tetra Bus at \$5 million per

spacecraft; this will be a series of spacecraft used to demonstrate and evaluate tactics, techniques and procedures. The second prototype award is for the Missile Defense Agency Tracking System at \$5 million. Ultimately, the goal is to develop a persistent space layer prototype concept to address warfighter requirements.

Space Rapid Capabilities Office

Consistent with the Fiscal Year 2018 NDAA, the Air Force is transitioning the Operationally Responsive Space Office into a new Space Rapid Capabilities Office (SRCO) under AFSPC. The SRCO must have the same rapid acquisition capabilities as the existing Air Force RCO. We are working hard on an implementation plan that will expand the former ORS office portfolio to include highly-classified, hand-picked, game-changing, space programs, that will move at an accelerated pace while not losing the demonstration, experimentation, warfighter-focus and Joint Capabilities Integration and Development System (JCIDS) exemptions covered in ORS statutory guidance. This will not be just a name change, AFSPC will look to broaden the scope and scale of this office to deliver real results.

A MORE RESILIENT SPACE ENTERPRISE

Command and Control

Essential to effective military operations in any domain is domain awareness and the ability to command and control forces. The fiscal year 2019 budget request improves essential space situational awareness and responsive command and control (C2) to provide tools, decision aids, and response options necessary to prevail if conflict extends into space. Enterprise Space Battle Management Command and Control (ESBMC2) will provide deliberate and crisis action planning products and decision support tools to enable the timely execution of authorities and command and control throughout the echelons of command, from strategic to tactical. The Air Force also recognizes that commercial companies are making real strides in technology and data management. We seek to leverage broad commercial industry innovation for national gain to maintain our competitive advantage.

AFSPC and the Air Force Rapid Capabilities Office (AFRCO) have partnered to rapidly develop the ESBMC2 capability needed to address emerging threats. This represents a new acquisition effort led by AFRCO to deliver an operational prototype which redefines the program formerly known as JSpOC Mission System (JMS) Increment 3 (now ESBMC2). This new acquisition approach is one example of AFSPC's new direction, enhancing the Air Force's

ability to command and control space assets in a contested environment. The Air Force is making use of rapid prototyping and a commercial consortium to assess new concepts and technologies, reduce risk to acquisition and field an early capability. Our goal is to energize the entire commercial industry around agreed upon standards to harness innovation. We have made great strides over this past year, and the prototype is on track for fiscal year 2021 delivery. In fiscal year 2021, this operational prototype will transition to SMC for continued rapid improvements and sustainment. Throughout all phases, SMC will act as the enterprise manager to coordinate interoperability and integration across multiple operation centers and acquisition efforts.

Space Situational Awareness

In 2016, AFSPC and the National Reconnaissance Office (NRO) developed a joint Space Situational Awareness and Indications and Warning Concept of Operations. As a result of this work, we seek to leverage synergies in AFSPC/NRO acquisition activities, where feasible, as the two organizations pursue architectures and operational approaches in support of their respective missions. As our first collaborative initiative, we have entered into a joint acquisition program known as SILENTBARKER. This program will provide threat Indications and Warning (I&W) and SSA information to better meet our warfighting mission. SILENTBARKER also represents a pathfinder for future collaborative acquisitions involving AFSPC and NRO, as appropriate.

The new Space Fence will provide un-cued surveillance of small objects and satellites, primarily in Low Earth orbit, but with secondary surveillance capabilities in Medium Earth and Geosynchronous orbits as well. This capability will enhance space flight safety, early detection and custody of potential threats, and awareness to satellite operators in the human space flight regime. Ultimately, it will be the most accurate high-capacity radar in the Space Surveillance Network, providing increased sensitivity and optimum coverage that will greatly increase the size and accuracy of the catalog of space objects. Fully funded in the Air Force's current budget request, initial operational capability of the first site is expected in fiscal year 2019.

To further improve the effectiveness, robustness, and resilience of the SSA mission, we must have the ability to interpret data from sources outside of the SSN. SMC is leading the way through implementation of the Non-traditional Data Pre-Processor (NDPP), which was operationally accepted in 2017. This flexible and extensible system, which is near-continuously updated, currently connects 29 companies using 111 sensors and satellites and provides well over

2000 messages per week into the JSpOC. NDPP is one of several data communications interfaces that will facilitate a SSA data repository. Initial buildout will be complete in fiscal year 2018, with expanded data sets available in fiscal year 2019. This data library will feed the use of both governmental and commercially developed mission applications that are delivered through Programs of Record such as JMS and legacy capability.

Enabled by interagency, commercial, and foreign partnering, thoughtful technology onboarding strategies and empowered program managers, commanders and fielded forces will have the improved domain awareness necessary to compete, deter, and if necessary, win.

Missile Warning

Global missile warning remains a real strategic advantage for our nation. On 19 January 2018, the Air Force launched the fourth geosynchronous Space-Based Infrared System (SBIRS) satellite, which will be operationally accepted later this year. Today, the current SBIRS architecture is exceeding expectations, enabling the Air Force to develop a plan which balances the right speed, innovation and risk to counter adversary technological advances and ensure a survivable missile warning capability by the mid-2020s. However, SBIRS satellites were not designed to operate in a contested space environment. A new approach is necessary to address potential threats. With the support of the Department of Defense and USSTRATCOM, the Air Force is taking a bold step in the fiscal year 2019 request; we will not procure or field SBIRS Vehicles 7 and 8.

Continued buys of the SBIRS spacecraft (i.e. SBIRS 7&8) delay our response to current and future counterspace threats and mitigation of advancements in adversary capabilities. Our plan is to begin transitioning to AFSPC's next generation strategic missile warning program in 2025. Additionally, the Air Force and the Missile Defense Agency are engaged in development of an integrated set of requirements focused on advancing missile warning and tracking. Acquisition speed, cost control, and survivability are the priorities of this new approach.

Satellite Communications

Global SATCOM is essential to every warfighter. Emerging threats are being addressed by both current and next-generation SATCOM programs. The fiscal year 2019 budget request continues efforts to enhance current protected SATCOM systems, while addressing future risks with an architecture that meets both strategic and tactical needs. As mentioned earlier, the Enhanced Polar System will complete multi-service requirements in fiscal year 2018 and is on

track to declare full operational capability by the first quarter of fiscal year 2019. The Advanced Extremely High Frequency (AEHF) satellite program provides strategic and nuclear-hardened communications capability to the President and other high-level decision makers. The fiscal year 2019 request adds operational resiliency features to future AEHF satellites to maintain strategic nuclear command, control, and communications necessary to defend against emerging threats.

Wideband Global SATCOM remains the backbone of wideband military satellite communications systems supporting a wide mix of networks that support multiple missions to include weather, missile defense, search and rescue and disaster relief. WGS vehicles 1 through 9 are operational and WGS-10 is projected to launch in the first quarter of fiscal year 2019. Meanwhile, an OSD-led Wideband Communications Services Analysis of Alternatives is evaluating WGS follow-on solutions; it will complete in fiscal year 2018 and be used to inform the fiscal year 2020 budget request.

The Commercial Satellite Communications (COMSATCOM) Pilot technology demonstration project is working toward increased flexibility, affordability, and resiliency for the Department of Defense SATCOM enterprise. The Pilot is a three-phase effort, which will realize the Fiscal Year 2016 NDAA, Sec. 1612, goal of demonstrating order-of-magnitude improvements in SATCOM capabilities by using commercial systems and technologies more effectively. Pilot Phase 2 includes design and development of SATCOM Flexible Modem Interface prototypes, definition of industry standards for that interface, and a limited demonstration of interoperability across multiple modems that share a SATCOM terminal or antenna. The end-state vision is for a COMSATCOM user to be able to "roam" rapidly among different satellite service providers and/or constellations, ultimately enabling more flexible, resilient SATCOM.

Congress has directed that I assume responsibility for procurement of COMSATCOM services for the Department of Defense not later than December 2018. We have already formed an AFSPC/DISA/USSTRATCOM/DoD CIO team to develop courses of action and an implementation plan for transfer of that responsibility. When coupled with my JFSCC role, this effort represents yet another opportunity to make delivery of SATCOM services to the Joint Force more efficient and effective.

Global Positioning System

The nation's Global Positioning System (GPS) is essential to our way of war and the American way of life. The GPS III space segment is the next generation of satellites providing backwards compatibility with previous GPS satellites, new civil Galileo-compatible signal and enhanced Military code (M-code) earth coverage power. With space vehicle technical challenges behind us, the Air Force declared GPS III Space Vehicle 01 (SV-01) available for launch in September 2017. SV-01 is currently proceeding through the pre-launch campaign for a launch later this year, and will use OCX Block 0 for command and control.

The Air Force is funding the next generation of GPS satellites with upgraded jam-resistance capabilities and modernizing the enterprise across all three segments: ground, satellite, and user equipment. The fiscal year 2019 budget request increases funding for anti-jam, anti-spoof, and anti-tamper military GPS development and integration into multiple joint platforms. AFSPC remains committed to working through significant technical challenges to ensure our GPS system remains the world's gold standard for positioning, navigation, and timing. To that end, preparations are underway for GPS III follow-on production (GPS III-F) for full and open competition on SVs 11-32.

The Operational Control System (OCX) is making steady progress. The Air Force accepted Block 0 (launch and checkout of GPS III space vehicles) in November 2017. Nevertheless, OCX remains under our close scrutiny. Upon the resolution of these issues, OCX will provide a cyber-secure and extensible C2 system enabling advanced military capabilities.

Modernized Military GPS User Equipment (MGUE) is being developed to implement advanced features, including improved anti-jam and navigation warfare capabilities, enabled by the new M-Code signal for all services and branches. Lead platform operational testing and evaluation for Increment 1 is scheduled to conclude by calendar year 2021. Increment 2, a pre-major defense acquisition program projecting integration with space-born receivers, precision-guided munitions, and handheld devices, is currently being evaluated by the Joint Requirements Oversight Council. The fiscal year 2019 budget increases funding for both MGUE Increments 1 and 2.

Space Based Environmental Monitoring

The Air Force has a short and long-term strategy to meet Space Based Environmental Monitoring (SBEM) requirements for the Department of Defense; the fiscal year 2019 request

funds sensors to conduct timely, reliable, and high-quality space-based capabilities to meet joint force combatant command requirements for atmospheric, terrestrial, oceanographic, and space weather observations. The fiscal year 2019 request re-phased \$42.7 million to fiscal years 2020/2021 to align with the Weather System Follow-on (WSF) service cost position and adds \$28.4 million for enhanced remote sensor processing.

The WSF-Microwave is the Department's primary source for SBEM gaps 3 (Ocean Surface Vector Winds) and 8 (Tropical Cyclone Intensity) data. It was put on contract in November 2017. WSF-Electro Optical/Infrared, focuses on SBEM gaps 1 (Cloud Characterization) and 2 (Theater Weather Imagery) at high latitudes, with a planned initial launch capability in fiscal year 2024. WSF-Electro Optical/Infrared Geostationary will satisfy combatant command cloud characterization and theater weather imagery requirements at low latitudes over the Indian Ocean by relocating and utilizing a residual National Oceanic and Atmospheric Administration geostationary satellite.

The Air Force remains engaged with the Joint Staff on the development of both materiel and non-materiel solutions that will meet requirements in this important mission area.

Assured Access to Space

Space launch is becoming a dynamic, competitive, innovative, and market-driven mission area. Due to our nation's policy of promoting competition, launch costs are decreasing and innovation is thriving. The Air Force is executing a strategy using public-private partnerships to share development costs with industry for new launch service capabilities through Launch Service Agreements (LSAs). LSAs will modify existing and planned commercial launch systems to meet Department of Defense and Intelligence Community launch requirements. The goal remains to obtain at least two domestic launch service providers that are certified to meet all National Security Space requirements.

AFSPC's approach to assured access to space is one that promotes competition and eliminates reliance on the RD-180 while maintaining a focus on mission success. The Evolved Expendable Launch Vehicle (EELV) program is executing a multifaceted acquisition approach. The program is using Other Transaction Authority agreements through 2018 to invest in domestic rocket propulsion systems and launch service development to facilitate transition off the RD-180 engine. EELV continues to procure launch services using certified providers and plans to continue to on-ramp and certify new entrants as they mature.

AFSPC recently released the EELV Phase 1A-6 Request for Proposal (RFP) to industry. This is the sixth competitive launch service solicitation under the current procurement strategy, and includes NRO Launch (NROL)-85, NROL-87, SBIRS GEO-5, GPS III-6, AFSPC-44, SILENTBARKER, and STP-4. Proposals for these launches are due back in April 2018. The intent is to individually award each mission by the first quarter of fiscal year 2019, although the RFP allows for rolling awards to meet mission requirements. To meet NROL-87 and AFSPC-44 integration timelines, the intent is to prioritize those two launches for award in early fiscal year 2019.

We have made a significant leap forward by partnering with SpaceX to make autonomous flight safety a reality. With an autonomous range, we will no longer have to call up the vast range infrastructure and associated personnel to support a launch. This allows us to launch on shorter timelines, with greater frequency and at reduced labor cost. Ultimately, our goal is that both of our launch ranges will be fully autonomous. Additionally, we have started the certification process for Falcon Heavy with its recent inaugural launch. We are on a path to certify a family of SpaceX launch vehicles for all National Security Space mission profiles to all orbital regimes. Going forward, I see a partnership with the burgeoning commercial space launch industry to be a great source of strength and I look forward to tapping into that strength and closer partnerships.

THE WAY AHEAD

Space superiority is not a birthright; it must be earned. The Air Force is committed to delivering on that expectation. Set within the context of our strategic direction, we have chartered our path forward.

While the fiscal year 2019 budget represents a bold pivot in U.S. strategy to protect and defend our space capabilities, this transition will not be completed in one year. The fiscal year 2019 space budget represents my intent and Air Force commitment to making wise, risk-informed, space superiority investments. Within this budget, we crafted an 8.4 percent increase in investment over the previous year and an 18.4 percent investment increase across the FYDP. This funding increase is intended specifically to counter the space superiority threat from China and Russia. We will improve space situational awareness, increase our ability to defend our nation's most vital space assets, build more jam-resistant GPS satellites, improve missile

warning, and expand partnerships to shape the strategic environment to compete, deter, and if necessary, win.

I thank the Committee for your leadership and support; together we will be build readiness and strength to preserve the peace and promote American prosperity.

General John W. “Jay” Raymond

Gen. John W. “Jay” Raymond is Commander, Air Force Space Command (Air Forces Strategic-Space) and the Joint Force Space Component Commander, U.S. Strategic Command, Peterson Air Force Base, Colorado. As Commander, Air Force Space Command, General Raymond is responsible for organizing, training, equipping and maintaining mission-ready space and cyberspace forces and capabilities for North American Aerospace Defense Command, U.S. Strategic Command and other combatant commands around the world. The command comprises approximately 36,000 space and cyberspace professionals assigned to 134 locations worldwide. As the Joint Force Space Component Commander, he directs assigned and attached USSTRATCOM space forces providing tailored, responsive, theater and global space effects in support of national objectives.

General Raymond was commissioned through the ROTC program at Clemson University in 1984. He has commanded the 5th Space Surveillance Squadron at RAF Feltwell, England, the 30th Operations Group at Vandenberg AFB, California, the 21st Space Wing at Peterson AFB, Colorado and 14th Air Force, USSTRATCOM, Joint Functional Component Command for Space. He deployed to Southwest Asia as Director of Space Forces in support of operations Enduring Freedom and Iraqi Freedom. The general's staff assignments include Headquarters Air Force Space Command, USSTRATCOM, the Air Staff and the Office of Secretary of Defense.

Prior to assuming command of Air Force Space Command, General Raymond was the Deputy Chief of Staff for Operations, Headquarters U.S. Air Force, Arlington, Va.

EDUCATION

- 1984 Bachelor of Science, Administrative Management, Clemson University, Clemson, S.C.
- 1990 Squadron Officer School, Maxwell AFB, Ala.
- 1990 Master of Science, Administrative Management, Central Michigan University, Mt. Pleasant, Mich.
- 1997 Air Command and Staff College, Maxwell AFB, Ala.
- 2003 Master of Arts, National Security and Strategic Studies, Naval War College, Newport, R.I.
- 2007 Joint Forces Staff College, Norfolk, Va.
- 2011 Combined Force Air Component Commander Course, Maxwell AFB, Ala.
- 2012 Joint Flag Officer Warfighting Course, Maxwell AFB, Ala.

ASSIGNMENTS

1. August 1985 - October 1989, Minuteman intercontinental ballistic missile crew commander; alternate command post; flight commander and instructor crew commander; and missile procedures trainer operator, 321st Strategic Missile Wing, Grand Forks AFB, N.D.
2. October 1989 - August 1993, operations center officer controller, 1st Strategic Aerospace Division, and executive officer, 30th Space Wing, Vandenberg AFB, Calif.
3. August 1993 - February 1996, Chief, Commercial Space Lift Operations, assistant Chief, Current Operations Branch, Headquarters Air Force Space Command, Peterson AFB, Colo.
4. February 1996 - August 1996, Deputy Director, Commander in Chief's Action Group, Headquarters Air Force Space Command, Peterson AFB, Colo.
5. August 1996 - June 1997, student, Air Command and Staff College, Maxwell AFB, Ala.
6. June 1997 - August 1998, space and missile force programmer, Headquarters U.S. Air Force, Arlington, Va.
7. September 1998 - April 2000, Chief, Expeditionary Aerospace Force Space and Program Integration, Expeditionary Aerospace Force Implementation Division, Headquarters U.S. Air Force, Arlington, Va.
8. April 2000 - June 2001, Commander, 5th Space Surveillance Squadron, RAF Feltwell, England
9. June 2001 - July 2002, Deputy Commander, 21st Operations Group, Peterson AFB, Colo.
10. July 2002 - June 2003, student, Naval War College, Newport, R.I.
11. June 2003 - June 2005, transformation strategist, Office of Force Transformation, Office of the Secretary of Defense, Arlington, Va.

12. June 2005 - June 2007, Commander, 30th Operations Group, Vandenberg AFB, Calif. (September 2006- January 2007, Director of Space Forces, Combined Air Operations Center, Southwest Asia)
13. June 2007 - August 2009, Commander, 21st Space Wing, Peterson AFB, Colo.
14. August 2009 - December 2010, Director of Plans, Programs and Analyses, Headquarters Air Force Space Command, Peterson AFB, Colo.
15. December 2010 - July 2012, Vice Commander, 5th Air Force, and Deputy Commander, 13th Air Force, Yokota Air Base, Japan
16. July 2012 - January 2014, Director of Plans and Policy (J5), U.S. Strategic Command, Offutt AFB, Neb.
17. January 2014 - August 2015, Commander, 14th Air Force (Air Forces Strategic), Air Force Space Command, and Commander, Joint Functional Component Command for Space, USSTRATCOM, Vandenberg AFB, Calif.
18. August 2015 - October 2016, Deputy Chief of Staff, Operations, Headquarters U.S. Air Force, Arlington, Va.
19. October 2016 - present, Commander, Air Force Space Command, Peterson AFB, Colo.
20. December 2017 - present, Joint Force Space Component Commander, Peterson AFB, Colo.

SUMMARY OF JOINT ASSIGNMENTS

1. June 2003 - June 2005, transformation strategist, Office of Force Transformation, Office of Secretary of Defense, Arlington, Va., as a colonel
2. July 2012 - January 2014, Director of Plans and Policy (J5), U.S. Strategic Command, Offutt AFB, Neb., as a major general
3. January 2014 - August 2015, Commander, Joint Functional Component Command for Space, USSTRATCOM, Vandenberg AFB, Calif., as a lieutenant general
4. December 2017 - present, Joint Force Space Component Commander, U.S. Strategic Command, Peterson AFB, Colo., as a general

OPERATIONAL INFORMATION

Badges: Master Space Operations Badge, Master Missile Operations Badge
 Systems: Counter Communications System, Deep Space Tracking System, Minuteman III

MAJOR AWARDS AND DECORATIONS

Distinguished Service Medal with oak leaf cluster
 Defense Superior Service Medal with oak leaf cluster
 Legion of Merit with oak leaf cluster
 Meritorious Service Medal with four oak leaf clusters
 Air Force Commendation Medal

OTHER ACHIEVEMENTS

2007 General Jerome F. O'Malley Distinguished Space Leadership Award, Air Force Association
 2015 Thomas D. White Space Award, Air Force Association
 2016 Peter B. Teets Government Award, National Defense Industrial Association
 2017 James V. Hartinger Award, National Defense Industrial Association

EFFECTIVE DATES OF PROMOTION

Second Lieutenant July 20, 1984
 First Lieutenant July 20, 1986
 Captain July 20, 1988
 Major July 1, 1996
 Lieutenant Colonel July 1, 1999
 Colonel July 1, 2004
 Brigadier General Aug. 19, 2009
 Major General May 4, 2012
 Lieutenant General Jan. 31, 2014
 General Oct. 25, 2016

(Current as of December 2017)

House Armed Services Committee

Subcommittee on Strategic Forces

March 15, 2018

Director

National Reconnaissance Office

Statement for the Record



Ms. Betty Sapp
Director, National Reconnaissance Office
Statement for the Record

Introduction

Good morning Chairman Rogers, Ranking Member Cooper, and distinguished Members of the Committee. It was a great pleasure to host you and your Committee colleagues at the NRO recently, and it's a great honor for me to be here today on behalf of the outstanding men and women of the National Reconnaissance Office (NRO) to discuss National Security Space.

NRO's Critical Mission

The NRO has a very clear, and a very critical mission for the Nation—we provide the space-based Intelligence, Surveillance, and Reconnaissance (ISR) capabilities necessary to maintain global situational awareness, and respond to change without risk of violating international law or putting US personnel in danger. We perform that mission to assure the U.S. an information and operational advantage.

NRO space-based capabilities, and their related ground systems, have always supported our national policy-makers. But those same capabilities now provide direct and critical support to U.S. warfighters. Our future thrusts, supported by our 2019 budget request, are focused on further improving what we are able to deliver to our warfighters, as well as our delivery timelines.

NRO Structure

The NRO is structured for success—we are small and streamlined, with end-to-end mission responsibility. Our small size assures that each of our government colleagues, no matter what rank or position, understands their specific contribution to the NRO mission and is empowered to act, achieve, and innovate. Our small size also encourages—even requires—that we fully leverage the talents and capabilities of our government partners, commercial industry, and our allies. And we do. The fact that we're streamlined in our management structure contributes to efficient decision-making,

allowing the agility required to stay ahead of the rapid changes we see in both threats and targets. Finally, our end-to-end mission responsibility, from advanced research and development (AR&D), to acquisition of space and ground systems, to launch, to operations, enables us to make the right trades, optimizing for mission success and affordability.

Performance Success

We've enjoyed success in all aspects of our end-to-end mission. Our AR&D Team has developed and matured the next-generation technology necessary to stay ahead of changing targets and threats, fill current mission gaps, and develop new partnerships. Our acquisition teams are delivering the capabilities our users need, on time and within budget. In 2017, for the 9th consecutive year, we achieved a "clean" independent audit opinion, demonstrating our ability to properly manage and account for the resources entrusted to us. We had four successful launches last year, including our first on a Space X Falcon 9 vehicle. Finally, and most importantly, we continued to deliver critical operational capabilities with a better than 99.7% reliability.

Our People

The NRO's impressive mission performance is enabled by an amazingly talented, dedicated, and diverse government workforce, comprised of both permanent party and rotational personnel. Our rotational members, assigned from the active duty military services and other agencies, bring breadth of experience and new thinking. Our permanent party personnel, including the NRO Cadre established in 2016, assures the depth of experience in space acquisition and operations necessary to mission success. The NRO has people, today, with the deep expertise in both space and in their specific mission function, to run complex acquisition programs successfully, and get the absolute most out of our on-orbit capabilities. The NRO Cadre will allow us to recruit, train, and retain their successors--the next generation of space leaders for the NRO and the Nation.

Impacts of Budget Uncertainty

While NRO people have done a tremendous job performing their duty for the Nation, they continue to be discouraged and disadvantaged by budget uncertainty—uncertainty that challenges execution of critical programs and slows the start of the new efforts required to sustain U.S. space superiority. Recent efforts to lift budget caps for two years are a step in the right direction, and greatly appreciated. However, budget stability is required if we want our space professionals to achieve all they are capable of doing for our Nation.

Fiscal Year 2019 Budget Request

Our Fiscal Year 2019 budget request will build on our successful history of delivering innovative overhead intelligence systems for national security, with the resilience required for the threat environment we face. We're specifically focused on investments that will deliver and assure the space-based capabilities we'll need in a future fight: 1) More Resilience, 2) More Capability and Capacity, and 3) More Speed.

More Resiliency

Greater resiliency continues to be a top priority. Processes and CONOPS to protect our current on-orbit systems are being refined and tested, and our people are being trained to use them to full advantage. New systems will have resiliency features built in as an inherent part of their design. Our operational ground stations are being modified for greater resiliency through hardening and redundancy. And our Future Ground Architecture will provide additional resiliency by taking advantage of the entire, integrated NRO multi-INT constellation, at machine speeds, in and out of conflict.

More Capability & Capacity

In a future conflict, resilient space must backstop and work in concert with resilient air assets. Our investments focus on achieving the capacity and the capabilities required by the IC & DoD. We are increasing persistence and the "look rate" from space, reducing the gaps currently exploited by adversaries. Working with our partners, we will enhance the ability of the U.S. to know what is "normal," detect any important change as soon as it happens, and enable U.S. policymakers and warfighters to understand and respond appropriately to that change.

Our planned growth in capability and capacity relies on assured access to space. We're optimistic about future launch opportunities via the Launch Services Agreement, now in competition by our Air Force mission partners. The Air Force is clearly committed to encouraging new and innovative launch service providers, eliminating our use of key foreign components, and providing a competitive environment supporting our full range of launch needs. We very much appreciate the efforts of our Air Force partners to assure us both reliable and affordable access to space.

More Speed

More capacity and capabilities in space must be combined with the ability to deliver that critical information directly to warfighters, at the tactical edge, and in the fight. And it must be delivered when they need it. Enabled by advances in Artificial Intelligence, Automatic Target Recognition, Machine Learning, and emerging technology, the NRO plans to do exactly that.

Conclusion

Everyone at the NRO is focused on our mission: delivering innovative overhead intelligence systems for national security. The current and projected threat environment doesn't change our mission--it just makes it more challenging. The men and women of the NRO are more than up to that challenge. Thank you for your support – for our mission, and for the urgency of action required to ensure we stay ahead of our adversaries. NRO's space professionals continue to demonstrate the dedication, professionalism, patriotism and passion for the mission. With your assistance, we'll empower them with the resources required to sustain our track record of success.

Mr. Chairman and members of the committee, thank you for your continued support of the NRO and for allowing me to appear before you today. I look forward to your questions.

##

Betty J. Sapp
Director, NRO

(U) Betty Sapp was appointed the 18th Director of the National Reconnaissance Office (DNRO) on July 6, 2012. The DNRO provides direction, guidance, and supervision over all matters pertaining to the NRO and executes other authorities specifically delegated by the Secretary of Defense and the Director of National Intelligence.

(U) Ms. Sapp began her government career as a United States Air Force officer in a variety of acquisition and financial management positions, including: business management positions in the NRO; Program Element Monitor at the Pentagon for the MILSTAR system; Program Manager for the FLTSATCOM program at the Space and Missile Systems Center in Los Angeles; and manager of a joint-service development effort for the A-10 engine at Wright-Patterson Air Force Base in Dayton, Ohio.

(U) In 1997, Ms. Sapp joined the Central Intelligence Agency. She was assigned to the NRO where she served in a variety of senior management positions. In 2005, she was appointed the Deputy Director, NRO for Business Plans and Operations. As such, she was responsible for all NRO business functions, including current-year financial operations, preparation of auditable financial statements, business systems development, budget planning, cost estimating, contracting, as well as all executive and legislative liaison activities.

(U) In May 2007, Ms. Sapp was appointed the Deputy Under Secretary of Defense (Portfolio, Programs and Resources), Office of the Under Secretary of Defense for Intelligence. In this position, she was responsible for: executive oversight of the multibillion-dollar portfolio of defense intelligence-related acquisition programs; the planning, programming, budgeting and execution of the multibillion dollar Military Intelligence Program; and the technology efforts critical to satisfying both current and future warfighter needs.

(U) In April 2009, Ms. Sapp was appointed the Principal Deputy Director, National Reconnaissance Office (PDDNRO). As PDDNRO, she provided overall day-to-day management of the NRO, with decision responsibility as delegated by the DNRO.

(U) Ms. Sapp holds a Bachelor of Arts, and an MBA, Management, both from the University of Missouri, Columbia. She is also Level III certified in Government Acquisition and was certified as a Defense Financial Manager. Ms. Sapp is a native of St. Louis, Missouri, and now resides in Alexandria, Virginia.

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STATEMENT OF
MR. KENNETH RAPUANO
ASSISTANT SECRETARY OF DEFENSE FOR HOMELAND DEFENSE &
GLOBAL SECURITY
BEFORE THE
SUBCOMMITTEE ON STRATEGIC FORCES
HOUSE ARMED SERVICES COMMITTEE

MARCH 15, 2018

Chairman Rogers, Ranking Member Cooper, and distinguished members of the subcommittee, it is a pleasure to appear before you along with General Jay Raymond, Commander of Air Force Space Command and U.S. Strategic Command Joint Force Space Component Commander, and Ms. Betty Sapp, Director of the National Reconnaissance Office. I serve as the Assistant Secretary of Defense for Homeland Defense and Global Security. In this capacity I oversee and guide the development and implementation of the Department of Defense's strategy and policy to achieve its space mission.

The Department appreciates Congress's and this subcommittee's focus on addressing the challenges we are facing in space. The Department must accelerate, and is accelerating, its response to the changing dynamics of space. The Deputy Secretary of Defense has heard Congress's concerns and, consistent with the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2018, has already taken action through interim implementation guidance, which included disestablishing the position of the Principal DoD Space Advisor, disestablishing the Defense Space Council, extending the expected term of the Commander of Air Force Space Command, and designating the Operationally Responsive Space office as the Space Rapid Capabilities Office.

But much more needs to be done to improve our ability to fight and win should a war either begin in or extend to space. The Deputy Secretary of Defense has also initiated a holistic review of the Department's space organization and management. The review is focusing on (1) our research, development, acquisition, and sustainment system; (2) organization and governance; (3) joint warfighting; and (4) workforce development. This approach is designed to ensure that we are postured most effectively to make the informed and well-reasoned recommendations to the organizational and management structure of the Department's national security space components. Pursuant to Section 1601(c) of the NDAA for FY 2018, the Deputy Secretary of Defense submitted his interim report on the organizational and management structure for the national security space components of the Department of Defense (DoD) on March 1, 2018. The Department looks forward to submitting the final report on this matter no later than August 1, 2018.

In parallel, also pursuant to the NDAA for FY 2018, the Department is initiating a Federally Funded Research and Development Center study to develop an independent plan for establishing a Space Department. When that plan is complete, we will use it to inform further consideration and evaluation of potential organizational changes. We remain committed to working with

Congress and this subcommittee to establish an organizational structure for national security space that meets the demands of our joint force.

NATIONAL SECURITY STRATEGY & NATIONAL DEFENSE STRATEGY

Space is a warfighting domain. Just as in air, land, sea, and cyberspace, the Department of Defense must prepare to address threats to our national security in the space domain. The new National Security Strategy and the National Defense Strategy prominently recognize space as an operating area from which capabilities are employed and forces are enabled, and acknowledges the potential for conflict to extend into space. These strategies direct that we compete as necessary to deter potential adversaries and, if directed, win any conflict that begins in or extends into space. Our ability to operate and leverage space to advance scientific knowledge, promote prosperity, and secure the freedoms of our citizens and allies and partners must remain unimpeded. We will compete, we will deter, and, if called upon to fight, we will win.

The National Security Strategy, published this past December, provides a plan to (1) protect the American people, the homeland, and the American way of life; (2) promote American prosperity; (3) preserve peace through strength; and (4) advance American influence. Each aspect of this plan is fortified and supported by the advantages our nation gains from space capabilities.

Our new National Defense Strategy (NDS) charts the course for how DoD will contribute to each of the National Security Strategy's four national interests. Addressing the challenges posed to our preeminence as a space power is fundamental to that effort. The Department will ensure the balances of power remain in our favor, and will advance an international order that is most conducive to our security and prosperity. Under the new NDS, long-term strategic competitions with China and Russia are the principal priorities for the Department, and because of the magnitude of the threats they pose to U.S. security and prosperity today, and the potential for those threats to increase in the future, require both increased and sustained investment.

To meet this challenge, the Department will enhance joint force lethality to compete with nations such as Russia and China; we will also deter and address challenges from North Korea, Iran, and terrorism; and we will hedge for uncertainty. In concert with making the force more lethal, we will develop a resource-sustainable approach by working with, and through, our allies and partners. We will also continue to bring business reforms to the Department to leverage

performance, affordability, and technological innovation while going after the bureaucratic excess and inefficient organizational structures that impede our effectiveness. We must deliver lethality and affordability at the speed of relevance. These approaches are as relevant and applicable to the space domain as they are to any other Department endeavor.

TRENDS AND THREATS

Advanced technologies are revolutionizing accessibility to space and space-derived capabilities at dramatically reduced costs. Technology continues to progress rapidly in areas such as 3-D printing, artificial intelligence, and machine learning, while advances in electronics are enabling ever-smaller form factors. Space system developers are leveraging all of these trends. Many of yesterday's cutting-edge technologies are mere commodities today, greatly reducing the economic barriers to entry into space. Significant amounts of private financing is pouring into commercial space, fueling a new and evolving space industry. We are witnessing advances in high-throughput communication satellites and the development of commercial plans for mega-constellations offering new capabilities in low-Earth orbit. The commercial sector, enabled by traditional aerospace companies as well as entrepreneurs and venture capitalists, is driving down the cost of access to space through the development of re-usable launch vehicles and other techniques. These developments together are planting the seeds from which future economic and commercial opportunities may grow.

Space is no longer the purview of only superpowers or even a handful of nations; participation in space activities is growing more diverse. Space-derived information services such as imagery, weather, communications, and intelligence, traditionally reserved to the governments of just a few space-faring nations, are becoming more attainable to non-State entities, companies, and individuals. The Director of National Intelligence, Daniel Coats, recently testified before the Senate Select Committee on Intelligence that the "global space industry expansion will further extend space-enabled capabilities and space situational awareness to nation-state, nonstate, and commercial space actors in the coming years, enabled by the increased availability of technology, private-sector investment, and growing international partnerships."¹ "This growth presents new challenges for the Department as new States, non-

¹ "World Wide Threat Assessment of the US Intelligence Community" Statement for the Record, Daniel R. Coats, Director of National Intelligence, presented to Senate Select Committee on Intelligence, February 13, 2018, p. 13

State actors, and commercial entities, both foreign and domestic, are able to provide services and capabilities once only available to the U.S. Government and a few other space-faring nations. The pace of technological expansion and growing accessibility are forcing our military to think and plan differently as potential adversaries leverage increased capabilities to observe our force movements, track our activities, and communicate with their own forces at efficiencies and data rates not previously available.

Today's potential adversaries and competitors have studied how the U.S. joint force operates and are rapidly developing capabilities designed to challenge our freedom of action across all domains. Those potential adversaries view space as an area where they could weaken our advantages and cause cascading impacts on our sea, air, land, and cyber systems that rely on space-based capabilities. Denial of U.S. space advantages is a key component of their strategy. As a result, the United States no longer enjoys the freedom to develop and leverage space systems without deliberate regard to other nations' counterspace capabilities. Russia and China are developing, testing, and fielding space and counterspace capabilities and are aligning their operational forces and employment strategies, which could be used in an attempt to deny U.S. freedom of action. They are also developing and fielding destructive and nondestructive counterspace weapons, which may provide them flexible response options during potential future conflict.

These same countries, recognizing the value of space capabilities, are also expanding their use of space to support the lethality and effectiveness of their military forces in other domains. As the Director of National Intelligence recently reported, China and Russia "will continue to expand their space-based reconnaissance, communications, and navigation systems in terms of the numbers of satellites, the breadth of their capability, and the applications for use."² These emerging threats, in and from space, place our nation's security at ever-increasing risk and drive the U.S. imperative to improve integration and synchronize combat power across multiple domains. This includes both the ability to defend our space-based capabilities from attack and the ability to protect our terrestrial forces from space-enabled attacks.

² Ibid

SPACE STRATEGY AND POSTURE

Our warfighting success is underpinned by our greatest strength – our people. The trends and threats we face require a cadre of professionals across all services and disciplines -- military, civilian, and contractor -- who recognize the capability, the commitment, the loyalty, the courage, and the cunning required to operate and succeed. To achieve this, we must continue to bring together the right training, the right technology, and the right people. Our space leaders are expected to think clearly about future conflict, learn through study of past and current operations, analyze capability gaps, identify opportunities, and implement solutions to improve the lethality of the joint force. This requires an approach that continues to enhance the joint force through stronger integration and through new developments and upgrades designed to close capability gaps. It includes a commitment to mission assurance and a strong posture to deter aggression. To compete, deter, and win in space, we must continue to develop, test, deploy, and sustain the innovative and resilient capabilities our warfighters need to fight and win in all domains.

The principles of war and joint operations guide our approach to warfighting and inform our strategy and posture. These principles have stood the test of time and act as a guide to approaching warfighting at the strategic, operational, and tactical levels. The validity of these principles does not dissipate at the boundary of the Earth's atmosphere. These principles are applicable across all domains in which conflict may occur. They guide our thinking about both deterrence and how to win the nation's wars in the event deterrence should fail.

On February 21, 2018, the National Space Council, chaired by Vice President Pence, endorsed and recommended that the President approve a national strategy that protects and advances our vital interest in space. The *National Strategy for Space* encompasses all aspects of our nation's space interest. It is composed of a strategic framework and implementation plan outlining four key strategic objectives. The first is to strengthen the safety, stability, and sustainability of space activities. The second is to deter and, when necessary, defeat adversary space and counterspace threats used for purposes hostile to the national security interests of the United States and its allies and partners. The third is to maintain U.S. commercial industry as the leading provider of traditional and innovative space technologies, goods, and services on the international space market while limiting potential adversaries' access to critical technologies and capabilities. The fourth is to maintain and extend U.S. human presence and robotic exploration beyond Earth to transform knowledge of ourselves, our planet, our solar system, and

our universe. The implementation plan describes four lines of effort: mission assurance, deterrence and warfighting, organizational support, and creating conducive domestic and international environments for U.S. space objectives. The lines of effort represent the key priorities of the strategy and, along with the supporting tasks, describe the ways and means necessary to achieve our strategic objectives.

The first line of effort focuses on Mission Assurance. We will accelerate the transformation of our space architecture by deliberately moving systems from the research and development phase to the actual fielding of capabilities. As a result, our space systems will be more resilient and more defensible. We are also looking to expand the ability to reconstitute space capabilities to reestablish lost functionality and we are exploring on-orbit satellite servicing capabilities. Fundamental to our strategy is our mission to deter, prepare for, and, if directed, prevail in any conflict, in any environment, against any threat.

The second line of effort focuses on Deterrence and Warfighting. Our strategy recognizes that – due to actions by our competitors and potential adversaries – the space domain is not a sanctuary. This line of effort seeks to develop options to deter potential adversaries from extending conflict into space. It entails a refocus of strategic guidance and doctrine; operational plans, capabilities, and culture; and rules of engagement to prepare most effectively for space as a warfighting domain. Although it is our desire that conflict not extend into space, the Department of Defense, if called upon, must stand ready to defend against all threats to our interests, even those posed 23,000 miles from the Earth’s surface.

The third and fourth lines of effort focus on Organizational Support and fostering a Conducive Environment. We will pursue improved foundational capabilities, structures, and processes in order to enable more effective space operations and will foster a conducive environment both at home and abroad. Domestically, this includes streamlining the regulatory environment to leverage and support U.S. industry more effectively, taking into account national security and public safety. Internationally, this includes promoting burden-sharing and marshalling cooperation against threatening adversary actions.

The President’s \$12.5 billion budget request for space in Fiscal Year 2019, outlined in Major Force Program-12, launches the Department on a course to build a more lethal force. It advances the lines of effort captured in the *National Strategy for Space* and integrates space into a multi-domain approach designed to deter potential adversaries and defeat hostile activity

should deterrence fail. This request, along with the projected \$8 billion increase from the Fiscal Year 2018 out-year planning profile to the 2019 Future Years Defense Plan, sustains our on-going space operations and support to the joint force while developing and fielding critical capabilities. The Fiscal Year 2019 budget request funds space and ground-based systems such as satellite communications; overhead persistent infrared (OPIR) capabilities; positioning, navigation, and timing (PNT); space-based environmental monitoring; and space control and space launch systems, among others. The Department continues to sustain existing systems, while progressing the development of follow-on capabilities necessary to enable operations in a contested space environment. The simultaneous actions and approach to sustaining and modernizing these critical space capabilities reflect our emphasis on increasing the capacity and lethality of the joint force. We will work to ensure space capabilities for the warfighter in all phases of conflict through investments in resilience, defensive operations, and reconstitution. This is no easy task; protection of our space systems will require creativity, thought, new capabilities and technologies, and the flexibility to leverage commercial and allied architectures. The increase in research, development, test, and evaluation funding is indicative of the need to integrate emerging technologies rapidly, enabled by our innovation base, into our national security space systems and architectures. This approach allows the Department to field next-generation capabilities while capitalizing on commercial developments. We are committed to a strong and continued partnership with Congress, our interagency partners, our allies and partners, and the U.S. space industry to accomplish this goal.

The Fiscal Year 2019 President's Budget Request (PBR) prioritizes activities to address the space threat. To do so requires the necessary space threat situational awareness capabilities to identify, characterize, and then respond. The Department is also making targeted investments in capabilities that evolve our existing space architecture to respond to hostile adversary space and counterspace systems and is pursuing enhancements that strengthen capabilities to address critical warfighter gaps. With this Fiscal Year 2019 budget request, we are making critical investments in capabilities necessary to protect and defend the space domain, such as the Deep Space Advanced Radar, an all-weather, day and night deep space surveillance and tracking capability for the entire geosynchronous belt. We are also funding the development, testing, and fielding of an on-orbit and ground system situational awareness capability. This program, a

partnership with the National Reconnaissance Office, represents the continued and important collaboration within our national security space enterprise.

The Fiscal Year 2019 budget request is further focused on improving the performance provided by our space systems to provide space effects in the face of advancing threats and to enhance our combat edge. It funds the Air Force's Next-Generation Strategic Missile Warning system as part of a transition to the future OPIR architecture that implements mature resiliency features to bolster strategic survivability. The Air Force will incorporate a technology refresh of the sensor to ensure missile warning capabilities equal to or greater than today's Space-Based Infrared Systems (SBIRS), taking advantage of sensor technology improvements, and will invest \$643 million toward the research and development of a next-generation missile warning system necessary for the transition to a resilient, survivable missile warning system readied for launch in the mid-2020s. To advance our precision navigation and timing capability, the budget requests \$452 million to develop our follow-on Global Positioning System (GPS) III system to present warfighters a much-needed jam-resistant signal. It also provides funds to improve the GPS ground segment to enable implementation of advanced Military code (M-Code), further improving the anti-jamming and secure access of the military GPS signals in contested environments.

Recognizing that access to space is the cornerstone for any space-based strategy, the Department continues to support this national objective. Within this budget request, the Evolved Expendable Launch Vehicle (EELV) program is aligned with the satellite launch schedules projected in Fiscal Year 2018 and Fiscal Year 2019 and continues the strategy to pursue a public-private partnership approach for future launch service acquisitions. The Air Force approach leverages the commercial industry with the requirement to eliminate the use of foreign-made propulsion systems.

The United States does not fight alone. Cooperation and partnership in the space domain are beneficial, just as cooperation and partnership benefit our military on land and sea and in the air and in cyberspace. Our defense strategy depends on sustaining and building international alliances and partnerships. The work in this area is critical to advance our common and shared strategic and operational interests of deterrence and lethality. U.S. allies and partners provide an asymmetrical advantage that no competitor can match. We will seek partnerships with the aim to develop and deploy more capable, more assured space architectures and, where appropriate and

mutually beneficial, develop a combined operational capacity. We will leverage past successes and achieve new ones, such as cost-sharing agreements, hosting U.S. national security payloads on foreign systems, and data-sharing arrangements to bolster shared space situational awareness. The Department of Defense, working with the Department of State, strengthens our leadership and international relationship through participation in international governing bodies and with multilateral and bilateral arrangements. One such effort is the Department's collaboration initiative on a communication system with Space Norway. The Fiscal Year 2019 budget request contains funding to accelerate the development of a hosted payload to provide our warfighters a secure communications capability in the northern polar region. This international space collaboration opportunity would meet a critical warfighter requirement at a substantially reduced cost compared to a traditional acquisition approach. Not only would this plan deploy a much-needed capability, it would also demonstrate the advantages, opportunities, and potential of continued international collaboration in a geographical area of great importance.

To enable greater performance and affordability with our space investments, we must innovate and evolve. The greatness of the United States has its roots in an almost insatiable desire to push boundaries, and the needs of our fighting force require our commitment to push the boundaries of innovation and technology. However, our innovative spirit should not stop there. Technology is not a panacea; it is only as good as our capability to leverage and employ it to our benefit. We must continue to innovate in our command and control paradigms, in our use of existing capabilities, and in our business processes and organizational structures. The Department is committed to evolving to an organization and management structure that is optimized and focused on the joint fight. We remain steadfast in our work with Congress to meet the needs of the combatant commanders and recognize we can only do that by establishing an efficient and streamlined organizational structure. The Deputy Secretary of Defense, in accordance with the direction provided in the National Defense Authorization Act for Fiscal Year 2018, is seeking an organizational structure focused on an end-state that, first and foremost, increases and ensures the lethality of the joint force.

Space is a warfighting domain – albeit a nascent and evolving one. Adversaries are watching, listening, and testing our resolve. Mindful of this, we must always undertake action in space with an understanding that norms of behavior are created as we, and all other space-faring nations, deploy capabilities and conduct operations.

The Department's partnership with Congress is and will remain absolutely critical to our success. To that end, I remain grateful for this subcommittee's strong support and interest in this vital area, and its advocacy to deter aggression and establish a lethal and effective force with the unmatched ability to prevail in, from, and through the ultimate high ground.

Kenneth P. Rapuano
Assistant Secretary of Defense for Homeland Defense and Global Security

Mr. Kenneth P. Rapuano is the Assistant Secretary of Defense for Homeland Defense and Global Security. Previously Mr. Rapuano was a Senior Vice President at the ANSER Corporation, and the Director of the Studies and Analysis Group which provided multi-disciplinary studies and operational analysis for a broad array of government clients in the national security, homeland security areas. Up until November of 2016, Mr. Rapuano Directed the Homeland Security Studies and Analysis Institute (HSSAI), a Federally Funded Research and Development Corporation (FFRDC) operated by ANSER, a mission oriented not-for-profit organization.

Prior to joining ANSER Mr. Rapuano was the Director of Advanced Systems at the MITRE Corporation. He was responsible for guiding crosscutting strategic national and homeland security mission initiatives, with particular focus on counterterrorism, intelligence, aviation security, crisis management/decision support, national preparedness, and CWMD.

Previously, Mr. Rapuano served at the White House as Deputy Homeland Security Advisor to President George W. Bush from 2004-2006. He was responsible for managing the development and implementation of homeland security policies among departments and agencies, chaired the Homeland Security Council Deputies Committee, and co-chaired the White House Counterterrorism Security Group. He left the White House in 2006 to volunteer for deployment as a Marine Corps officer to Afghanistan with a Joint Special Operations Task Force, establishing and directing a targeting fusion center tracking high-value terrorists and insurgents. He also served in Iraq in 2003, commanding the Joint Interrogations and Debriefing Center of the Iraq Survey Group established to conduct the mission of surveying and exploiting possible weapons of mass destruction activities across Iraq.

In 2003, Mr. Rapuano was appointed Deputy Under Secretary for Counter Terrorism at the Department of Energy, responsible for nuclear counter terrorism, homeland security, emergency response, and all related special access programs for DOE and the National Nuclear Security Administration. Previous to that, he was the National Security Advisor to the Secretary of Energy. Mr. Rapuano has also served as Special Assistant to the Assistant Secretary of Defense, International Security Policy. He served 21 years on active duty and in the reserves as a Marine Corps infantry officer and intelligence officer.

Mr. Rapuano has also served as a Distinguished Research Fellow at the National Defense University's Center for the Study of WMD, as a member of the Defense Science Board Task Force on the Role of DoD in Homeland Defense, the Pacific Northwest National Lab's National Security Advisory Committee, the FBI's Weapons of Mass Destruction Directorate Advisory Group, the DHS Quadrennial Homeland Security Review Advisory Committee, and the DHS Science and Technology Advisory Committee.

Mr. Rapuano received a bachelor's degree in Political Science from Middlebury College, a master's degree in National Security Studies from Georgetown University, and has attended the Marine Corps Air-Ground Task Force Intelligence Officer Course at the Navy and Marine Corps Intelligence School.

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MARCH 15, 2018

QUESTIONS SUBMITTED BY MR. ROGERS

Mr. ROGERS. You have been dual-hatted as both the JFSCC and Space Command, did you receive any additional resources to execute those additional missions? Do you anticipate needing any in the future?

General RAYMOND. [The information was not available at the time of printing.]

Mr. ROGERS. You frequently deferred to the classified session a number of issues I asked about, and in the classified session you frequently deferred again citing insufficient classification. This kind of purposeful dodging is unacceptable. In the context of deterrence, messaging your adversaries is an essential component of reducing misunderstanding and miscalculation. What are you doing to review appropriate classification guidance documents to ensure that you can share with Congress all the information necessary to perform our oversight in a transparent manner and message our adversaries about our capabilities?

General RAYMOND. [The information was not available at the time of printing.]

Mr. ROGERS. I hear conflicting things about disaggregation and the budget documents are equally confusing. Is disaggregation a path the Department and the Air Force is walking down? If so where is it demonstrated in your Air Force Programs?

General RAYMOND. [The information was not available at the time of printing.]

Mr. ROGERS. How is SMC reorganizing to better streamline space acquisitions?

General RAYMOND. [The information was not available at the time of printing.]

Mr. ROGERS. How are you executing the enhanced OT&E authorities for space that we provided you in last year's NDAA?

General RAYMOND. [The information was not available at the time of printing.]

Mr. ROGERS. How much of your time do you spend on space policy and space budget oversight in your role as ASD for Homeland Defense and Global Security? Do you feel you have the appropriate resources to oversee the DOD space policy and budget responsibilities as we transition to a warfighting domain?

Secretary RAPUANO. [The information was not available at the time of printing.]

Mr. ROGERS. What is your role in space licensing and registration for commercial remote sensing?

Secretary RAPUANO. [The information was not available at the time of printing.]

QUESTIONS SUBMITTED BY MR. LAMBORN

Mr. LAMBORN. The Wideband SATCOM AoA seeks to identify the best mix of military and commercial SATCOM and consider which mission support roles could be filled using emerging COMSATCOM capabilities.

(1) Given the wide range of commercial SATCOM capabilities and the high cost and lengthy process for building and launching purpose-built satellites, what steps are being taken to fully leverage commercial space capabilities to enhance space resiliency?

(2) Furthermore, what changes to the acquisition and budget processes are needed to make acquiring commercial SATCOM communications capabilities and integrating MILSATCOM and COMSATCOM a more enduring, collaborative, efficient, and timely process?

(3) How do you envision AFSPC Commander General Raymond using his new authorities in this area, between the FY18 NDAA and his recent dual-hatting as your Joint Force Space Component Commander?

General RAYMOND. [The information was not available at the time of printing.]

Mr. LAMBORN. (1) From SATCOM, to imagery, to weather data, SSA, and other areas, what are you doing to build bridges and leverage our significant advantages in commercial space entrepreneurialism?

(2) What barriers do our space acquisition professionals face to deliberately and purposefully leverage commercial space to enhance the resilience and capacity of our military advantages in space?

General RAYMOND. [The information was not available at the time of printing.]

Mr. LAMBORN. (1) From SATCOM, to imagery, to weather data, SSA, and other areas, what are you doing to build bridges and leverage our significant advantages in commercial space entrepreneurialism?

(2) What barriers do our space acquisition professionals face to deliberately and purposefully leverage commercial space to enhance the resilience and capacity of our military advantages in space?

Ms. SAPP. [The information was not available at the time of printing.]

Mr. LAMBORN. Now that AFSPC Commander Gen Raymond is dual-hatted as the Joint Force Space Component Commander, what are your thoughts on taking that a step further and making him a sub-unified joint commander under USSTRATCOM?

(1) Would this help further align in a single person authorities for OTE with the authorities to plan, task, and direct space forces in the joint warfighting domain?

(2) Would this create “unity of decision” in one person, similar to other organizations that have outpaced the threat (i.e., SOCOM, Navy Submarines, Strategic Air Command)?

(3) Do you agree that we need one person with the right authorities to wake up every day and think about how to have the best military space program in the world? How would this change help accomplish this goal?

Secretary RAPUANO. [The information was not available at the time of printing.]

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(2) What barriers do our space acquisition professionals face to deliberately and purposefully leverage commercial space to enhance the resilience and capacity of our military advantages in space?

Secretary RAPUANO. [The information was not available at the time of printing.]

QUESTIONS SUBMITTED BY MR. TURNER

Mr. TURNER. Last year’s NDAA FY18 Conference Report terminated the position and office of the Principal Department of Defense Space Advisor (PDSA) and transferred duties, responsibilities and personnel to a single official selected by the Deputy Secretary of Defense. How does this new change impact the Air Force, the Department, and our readiness in the space warfighting domain?

General RAYMOND. [The information was not available at the time of printing.]

Mr. TURNER. In order to maintain great power competition, should we be focusing on administrative changes such as a formation of a new service or the lethality of our national security space programs? Does our current budget reflect the latter?

General RAYMOND. [The information was not available at the time of printing.]

Mr. TURNER. In order to maintain great power competition, should we be focusing on administrative changes such as a formation of a new service or the lethality of our national security space programs? Does our current budget reflect the latter?

Ms. SAPP. [The information was not available at the time of printing.]

Mr. TURNER. During the hearing you mentioned that the President is “very focused on outcomes” and is “interested in the Department [being] best organized and equipped to achieve our vital missions in space”. You also mentioned that Deputy Secretary Shanahan will be providing the best set of options, per the request of Congress, in the final report due in August. Given our issues with great power competition against Russia and China, do we have the luxury of waiting for the final report or are there steps that Congress should be taking prior to the report?

Secretary RAPUANO. [The information was not available at the time of printing.]

Mr. TURNER. In order to maintain great power competition, should we be focusing on administrative changes such as a formation of a new service or the lethality of our national security space programs? Does our current budget reflect the latter?

Secretary RAPUANO. [The information was not available at the time of printing.]

QUESTIONS SUBMITTED BY MR. COFFMAN

Mr. COFFMAN. It is my understanding that traditional Evolved Expendable Launch Vehicle (EELV) providers are contracted under Federal Acquisition Regulations (FAR) 15, while new entrants are contracted under FAR 12. It is also my understanding that FAR 12 is a more commercial way of doing business than FAR 15. Please explain the differences in procuring launch services using FAR 12 vs. FAR 15. Does DOD have the same insight on costs, as well as oversight on mission assurance when using both of these contracting methods, or is one more stringent than the other? Should the Air Force consider contract mechanisms that ensure DOD has access to enough technical data to make an independent assessment in the case of an anomaly or launch failure? If so, what would that look like and if not, why not?

General RAYMOND. [The information was not available at the time of printing.]

Mr. COFFMAN. It is my understanding that traditional Evolved Expendable Launch Vehicle (EELV) providers are contracted under Federal Acquisition Regulations (FAR) 15, while new entrants are contracted under FAR 12. It is also my understanding that FAR 12 is a more commercial way of doing business than FAR 15. Please explain the differences in procuring launch services using FAR 12 vs. FAR 15. Does DOD have the same insight on costs, as well as oversight on mission assurance when using both of these contracting methods, or is one more stringent than the other? Should the Air Force consider contract mechanisms that ensure DOD has access to enough technical data to make an independent assessment in the case of an anomaly or launch failure? If so, what would that look like and if not, why not?

Secretary RAPUANO. [The information was not available at the time of printing.]

