

Stenographic Transcript  
Before the

COMMITTEE ON  
ARMED SERVICES

## **UNITED STATES SENATE**

HEARING TO CONSIDER THE NOMINATIONS OF:  
DR. CHRISTOPHER J. SCOLESE  
TO BE DIRECTOR OF THE NATIONAL RECONNAISSANCE  
OFFICE; AND  
GENERAL JOHN W. RAYMOND, USAF  
FOR REAPPOINTMENT TO THE GRADE OF GENERAL AND  
TO BE COMMANDER, UNITED STATES SPACE COMMAND AND  
COMMANDER, AIR FORCE SPACE COMMAND

Tuesday, June 4, 2019

Washington, D.C.

ALDERSON COURT REPORTING  
1111 14TH STREET NW  
SUITE 1050  
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(202) 289-2260  
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11 U.S. Senate

12 Committee on Armed Services

13 Washington, D.C.

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15 The committee met, pursuant to notice, at 9:30 a.m. in  
16 Room SD-G50, Dirksen Senate Office Building, Hon. James M.  
17 Inhofe, chairman of the committee, presiding.

18 Committee Members Present: Senators Inhofe, Fischer,  
19 Cotton, Rounds, Ernst, Tillis, Sullivan, Cramer, McSally,  
20 Scott, Blackburn, Hawley, Reed, Shaheen, Kaine, King,  
21 Heinrich, Peters, Manchin, and Jones.

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1           OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S.

2   SENATOR FROM OKLAHOMA

3           Chairman Inhofe: Our meeting will come to order.

4           We have two great witnesses we will be talking to this  
5 morning and witnesses we are very familiar with in an area  
6 that is a very significant area.

7           We do have two of our members that have come in for the  
8 purpose of introduction of the two. Let us go ahead and  
9 start. Senator Van Hollen, if you would like to make your  
10 introduction, this would be a good time to do it.

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1           STATEMENT OF HON. CHRIS VAN HOLLEN, U.S. SENATOR FROM  
2 MARYLAND

3           Senator Van Hollen: Thank you, Mr. Chairman and to  
4 Ranking Member Reed and to all the members of the committee.  
5 It is my honor to be with you this morning to introduce  
6 Chris Scolese, the nominee for the Director of the National  
7 Reconnaissance Office, known as NRO.

8           And, Mr. Chairman, while I cannot say that I am happy  
9 to see Mr. Scolese leave his current duties in the State of  
10 Maryland for NASA, I can say with great confidence that NRO  
11 would be very fortunate to have him as their director.

12           Since March 2012, Mr. Scolese has served as Director of  
13 NASA Goddard Space Flight Center, which is located in  
14 Greenbelt, Maryland. We are proud of the work that he is  
15 doing and his whole team at NASA Goddard on earth sciences  
16 and moving forward with the James Webb telescope, which will  
17 be the premier space observatory of the next decade.

18           Mr. Scolese has worked in a variety of positions at  
19 Goddard and before that at NASA headquarters. Prior to  
20 joining NASA in 1987, he served as an officer in the United  
21 States Navy working on classified programs and worked as a  
22 civilian at the Defense Department and the General Research  
23 Corporation.

24           He is a recipient of many honors. I am not going to go  
25 through the whole list, but I can tell you that they include

1 the very prestigious 2018 American Institute of Aeronautics  
2 on Astronautics Von Karman Award. And Mr. Scolese started  
3 early. He received the award many years ago from the  
4 American Institute of Aeronautics and Astronautics National  
5 Capital Section Young Engineer -- Scientist of the Year  
6 Award.

7 Between that early award and the recent award, he has  
8 received many other accolades and much recognition. He has  
9 had experience managing organizations and developing space  
10 systems at NASA, including over 100 space missions in earth  
11 orbit and beyond, directly correlating to many of NRO's  
12 missions.

13 Ultimately, Mr. Chairman and members of the committee,  
14 I can say that Mr. Scolese is a devoted public servant. He  
15 sets a high bar for everybody serving in government. He is  
16 the consummate professional and an experienced manager. And  
17 this committee can always rely on him to pursue the best  
18 interests of his agency and our country.

19 Mr. Chairman, Ranking Member, members of the committee,  
20 I highly recommend Mr. Scolese for the Director of the NRO.  
21 And while we will miss him in Maryland, I have no doubt that  
22 the country will be well served by Mr. Scolese in his new  
23 position.

24 Chairman Inhofe: Well, thank you very much, Senator  
25 Van Hollen. And, Dr. Scolese, it does not get any better

1 than that.

2           So we recognize now Senator Gardner for the purpose of  
3 an introduction.

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1           STATEMENT OF HON. CORY GARDNER, U.S. SENATOR FROM  
2 COLORADO

3           Senator Gardner: Thank you, Chairman Inhofe. Thank  
4 you, Ranking Member Reed, as well to the full committee for  
5 the opportunity participate in this hearing today and to  
6 introduce General Raymond.

7           It is my honor to introduce a fellow Coloradan and my  
8 friend, General Jay Raymond as the nominee to lead U.S.  
9 Space Command, as well as Air Force Space Command. I also  
10 welcome Molly and their great family here to the hearing  
11 today.

12           No doubt these are critical roles supporting the  
13 defense of our nation, and I am proud of the extensive  
14 military space operations that are being conducted in my  
15 home State of Colorado.

16           General Jay Raymond is no stranger to this committee.  
17 For those in attendance who may not know, you cannot discuss  
18 space or space operations without relying upon the  
19 tremendous career of service and work by General Raymond.  
20 As the Commander of Air Force Space Command at Peterson Air  
21 Force Base in Colorado Springs, Colorado, General Raymond is  
22 responsible for the organizing, training, equipping, and  
23 maintaining of over 26,000 mission-ready Space Forces to  
24 meet the operational needs of U.S. Strategic Command, North  
25 American Aerospace Defense Command, as well as combatant

1 commands worldwide. This is, of course, in addition to  
2 General Raymond's role as the Joint Force Space Combatant  
3 Commander.

4 General Raymond has answered our nation's call many  
5 times. I have the greatest confidence him as he does so  
6 once again to lead U.S. Space Command.

7 As Congress moves forward with this discussion about  
8 the reorganization of military space operations, I cannot  
9 think of anyone more knowledgeable, better prepared, or more  
10 respected than General Jay Raymond to lead those efforts.

11 I thank you, Mr. Chairman and Ranking Member, for this  
12 opportunity to be here today.

13 Chairman Inhofe: Thank you very much, Senator Gardner.  
14 In fact, both of you are welcome to stay here for opening  
15 statements, if that is your desire, but if your schedule  
16 does not permit, then we would excuse you. Thank you very  
17 much for an excellent introduction.

18 We are here today to consider the nomination of the two  
19 that have just been introduced, and we thank both of you for  
20 being here today. I know some of you have families here.  
21 We would like to have you introduce your families at the  
22 appropriate time and any other friends that you have brought  
23 with you. We have a room reserved for a classified  
24 discussion if it becomes necessary, which I hope it does  
25 not. We can adjourn to that room. That will be down in the



1 Visitors Center at 217.

2 Now, we have certain required questions to ask, and so  
3 what I would like to ask of each of you is to respond  
4 audibly so that we will have you on record.

5 I am speaking to both of you now. Have you adhered to  
6 applicable laws and regulations governing conflicts of  
7 interest?

8 Dr. Scolese: Yes.

9 Chairman Inhofe: I heard one yes.

10 General Raymond: Yes.

11 Chairman Inhofe: Oh, good.

12 Do you agree, if confirmed, to appear and testify, upon  
13 request, before this committee?

14 Dr. Scolese: Yes.

15 General Raymond: Yes.

16 Chairman Inhofe: Do you agree to provide documents,  
17 including copies of electronic forms of communication, in a  
18 timely manner when requested by a duly constituted committee  
19 or to consult with the committee regarding the basis of any  
20 good faith delay or denial in providing such documents?

21 Dr. Scolese: Yes.

22 General Raymond: Yes.

23 Chairman Inhofe: Will you ensure that your staff  
24 complies with the deadlines established for requested  
25 communications, including questions for the record in

1 hearings?

2 Dr. Scolese: Yes.

3 General Raymond: Yes.

4 Chairman Inhofe: Will you cooperate in providing  
5 witnesses and briefers in response to congressional  
6 requests?

7 Dr. Scolese: Yes.

8 General Raymond: Yes.

9 Chairman Inhofe: Will those witnesses be protected  
10 from reprisal for the testimony or briefings?

11 Dr. Scolese: Yes.

12 General Raymond: Yes.

13 Chairman Inhofe: Have you assumed any duties or  
14 undertaken any actions which would appear to presume the  
15 outcome of the confirmation process?

16 Dr. Scolese: No.

17 General Raymond: No.

18 Chairman Inhofe: The National Defense Strategy directs  
19 our national military to prepare for the return of great  
20 power competition. This means that we must be prepared to  
21 deter and, if necessary, decisively defeat potential near-  
22 peer adversaries. Obviously, we are talking about China and  
23 Russia.

24 In order for the Department of Defense to achieve that  
25 goal, the U.S. Space Command must have forces to present

1 that are trained and equipped appropriately. The Commander  
2 of U.S. Space Command will need to plan and execute global  
3 space operations as directed. As this is a newly  
4 established unified combatant command with an expansive area  
5 of operations, your interaction with the intelligence  
6 community, including the National Reconnaissance Office,  
7 will be vital in rebuilding and establishing space  
8 warfighting readiness. I urge you both to embrace  
9 collaboration. That means working with each other.

10 We are at a serious risk of falling behind in our great  
11 power competition, but both of you can prevent that. We  
12 know that that is not confined to space. We know that there  
13 are problems out there that did not used to be there. There  
14 was a time when there was a presumption that what we had in  
15 America was always better than what they, whoever they  
16 happened to be at the time. That is not true anymore.

17 The Intelligence Authorization Act for fiscal year 2014  
18 requires the Director of the National Reconnaissance Office  
19 be appointed by the President, with the advice and consent  
20 of the Senate. The Senate Select Committee on Intelligence  
21 held a hearing for Dr. Scolese on the 1st of May and  
22 referred the nomination to the Armed Services Committee  
23 today. Now, that is all written in law. That actually came  
24 through our NDAA of 2014. So this is the first time that  
25 that application has application has taken place.

1           Dr. Scolese, your duties and span of control of the NRO  
2 will be far-reaching. I was initially concerned with your  
3 public statement regarding the establishment of the United  
4 States Space Command and the possibility of integration and  
5 synchronization of the NRO. And so we felt a sense a little  
6 bit of turf creeping in, which quite often does. So I would  
7 like to know the reason, Dr. Scolese, for making such a bold  
8 statement without knowing the details of the proposed  
9 organization or speaking against the integration of any  
10 intellectual community assets within the future Space  
11 Command.

12           General Raymond, as you prepare to establish the U.S.  
13 Space Command, if confirmed, I would like to know if you  
14 believe that you have the resources and personnel and all  
15 that necessary to complete the job that is going to be  
16 assigned and the awesome responsibility that will be  
17 assigned to you.

18           Senator Reed?

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1           STATEMENT OF HON. JACK REED, U.S. SENATOR FROM RHODE  
2 ISLAND

3           Senator Reed: Well, thank you very much, Mr. Chairman.  
4 Let me join you in welcoming the nominees and also their  
5 families who serve with them, quite literally.

6           General Raymond, you have been nominated to serve as  
7 the Commander of the newly reestablished United States Space  
8 Command. The last nomination for a Commander of Space  
9 Command was General Eberhart in 1999 before the command was  
10 disestablished in 2002. It has become very clear in the  
11 past few years that space is becoming not only increasingly  
12 important for our every day lives, but also a contested  
13 domain where the United States may be challenged by our  
14 adversaries. As a result, Congress authorized a sub-unified  
15 command last year, and the committee believes that a full  
16 unified command is now appropriate.

17          Dr. Scolese, you are nominated to be the Director of  
18 the National Reconnaissance Office, or NRO. You are the  
19 first nominee for this position to appear before this  
20 committee under a recent change in Senate rules. So  
21 welcome. You will add much to today's discussion.

22          General Raymond, you are nominated to be the Commander  
23 of a joint command conducting joint operations. Yet, the  
24 overwhelming majority of personnel who work in space are  
25 members of the Air Force. I am interested in how you will

1 meet the joint mandate of the Goldwater-Nichols Act with  
2 almost all space activities occurring in one service.

3 Dr. Scolese, the NRO is the servant of two masters:  
4 the Secretary of Defense and our military forces, on the one  
5 hand; and the Director of National Intelligence and  
6 policymakers on the other. The NRO is also jointly staffed  
7 by DOD and the CIA. The NRO builds reconnaissance  
8 satellites, but the requirements for them are set by mission  
9 partners and users. The NRO operates satellites, but  
10 tasking decisions are made by NSA and the National  
11 Geospatial Intelligence Agency. We would like to hear how  
12 you plan to equitably meet the demands of both the Defense  
13 Department and the intelligence community as you carry out  
14 your duties.

15 An issue that will be paramount for both of you is  
16 Space Command's relationship with the NRO. The  
17 administration has proposed a Space Force and a unified  
18 space command because of the growing importance and  
19 contested nature of the space domain and the need for  
20 elevated priorities, unified command structures, and  
21 integrated capability development. But NRO remains  
22 independent of the Space Command and Space Force, leaving a  
23 seam in our national security space. Both General Raymond  
24 and Mr. Scolese, I am very interested in your views on how  
25 you plan to work together to overcome this seam,

1 particularly as we look to a future where there may actually  
2 be conflict in space.

3 Another issue between Space Command and NRO is  
4 acquisition. 20 years ago, General Eberhart did not believe  
5 that space acquisition was adequately coordinated with NRO,  
6 and unfortunately, I believe the same problems may exist  
7 today. In fact, NRO recently opposed the plans of the  
8 proposed DOD Space Development Agency. I understand that  
9 NRO wants to continue its mission to build reconnaissance  
10 satellites for the military. However, DOD's leaders see an  
11 opportunity to solve pressing targeting and survivability  
12 challenges by embracing new commercial approaches to  
13 building very large constellations of smaller and far less  
14 expensive satellites. General Raymond and Dr. Scolese, once  
15 again I would be interested in your views on how to ensure  
16 DOD's warfighting needs are met through innovative solutions  
17 while minimizing unnecessary duplication.

18 Again, gentlemen and your families, thank you for your  
19 willingness to serve the nation.

20 Chairman Inhofe: An excellent statement.

21 We will now have opening statements starting with you,  
22 Dr. Scolese, and your entire statement, of course, will be  
23 made a part of the record. So you can be brief, if you  
24 would like. You are recognized.

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1           STATEMENT OF DR. CHRISTOPHER J. SCOLESE, TO BE  
2           DIRECTOR OF THE NATIONAL RECONNAISSANCE OFFICE

3           Dr. Scolese: Thank you, sir. Chairman Inhofe, Ranking  
4           Member Reed, distinguished members of the committee, I am  
5           honored to appear before you as the first presidential  
6           appointee requiring Senate confirmation for the position of  
7           the Director of the National Reconnaissance Office.

8           Additionally, I am very pleased to be here today with  
9           General Raymond, as it is critical that the U.S. Space  
10          Command and NRO work closely together to assure the security  
11          of our country and our allies.

12          I was privileged to meet with members of the committee  
13          to hear your views and goals for the NRO. I would also like  
14          to thank the committee staff, as I know there is a  
15          tremendous amount of preparation that goes into any  
16          confirmation hearing.

17          I am honored to have been nominated by the President.  
18          I am also grateful that Acting Secretary of Defense Shanahan  
19          and Director of National Intelligence Coats have the trust  
20          and confidence in my ability to serve in this new capacity.  
21          If confirmed, I look forward to working with you and with  
22          the extraordinary women and men of the NRO.

23          I am profoundly grateful to have my wife of 38 years,  
24          Dianne, with me here today. Our four children and their  
25          spouses and children were not able to be with us today due



1 to prior commitments. Their unconditional support means the  
2 world to me.

3       Additionally, I want to remember my parents who passed  
4 away many years ago. My father was a typewriter repairman,  
5 and my mother was a secretary. They encouraged my sister  
6 and me to go to college so that we could have more  
7 opportunities. I think about them daily.

8       I was born and raised in Buffalo, New York. It was a  
9 wonderful place to grow up. As a teenager, I was inspired  
10 by the machines that made space exploration possible and  
11 spent a lot of time building rockets and electronic devices  
12 that led to me winning the western New York Science Fair.  
13 That early passion set the trajectory for my career, a path  
14 that has led me to be here today as the nominee for the  
15 Director of the NRO.

16       I am proud to have had 40 years of service in the  
17 nuclear Navy and at NASA. I have been fortunate to be  
18 involved with diverse systems such as nuclear submarines and  
19 spacecraft that have been instrumental in protecting our  
20 national security and advancing our knowledge of the earth  
21 and the universe.

22       During the last 3 decades at NASA, I have held various  
23 positions involved in design, development, acquisition,  
24 launch, and operation of space systems, large and small,  
25 scaled to accomplish our mission.

1 Under my leadership, Goddard Space Flight Center  
2 developed satellites and systems to meet the requirements  
3 for NASA and other organizations. I also ensured that the  
4 valuable lessons we learned were incorporated into plans  
5 that have resulted in improved performance on recent  
6 missions for NASA, NOAA, and other partner organizations.

7 The continued advance of technology provides an  
8 opportunity to maintain our national space advantage in an  
9 increasingly competitive and contested environment. The  
10 combination of commercial capabilities, technological  
11 advancements, collaboration with other organizations, and  
12 government-developed systems provides opportunities to  
13 expand the supplier base, improve performance, reduce cost,  
14 and enhance resiliency.

15 An organization's people are at the heart of its  
16 success. At NASA, I have had the opportunity to lead and  
17 manage large and diverse workforces. Nothing can be  
18 accomplished without the talented women and men who are  
19 motivated to accomplish the mission. I am proud that  
20 Goddard was ranked as one of the best places to work in the  
21 Federal Government.

22 If confirmed, I am committed to fostering an  
23 environment at the NRO that welcomes diverse views, invites  
24 new concepts, and energizes its workforce every day. This  
25 includes recruiting, training, and retaining a world-class

1 workforce, allowing the NRO to provide premier space  
2 reconnaissance capability.

3 In closing, the NRO is one of the fabled organizations  
4 of the space age, and the capabilities that it has provided  
5 have been instrumental in maintaining the United States'  
6 strategic advantage. The NRO helps keep our country and the  
7 world safe from those who seek to do us harm.

8 If confirmed, I look forward to working closely with  
9 this committee and the entire Congress to leverage our  
10 opportunities and address our challenges and to seek your  
11 support to ensure that the NRO continues developing and  
12 delivering critical intelligence to policymakers,  
13 warfighters, and intelligence analysts.

14 If confirmed as Director, I will uphold the National  
15 Reconnaissance Office's obligations to Congress and the  
16 American people.

17 Chairman Inhofe, Ranking Member Reed, and distinguished  
18 members of the committee, thank you for the opportunity to  
19 appear before you today. I look forward to answering your  
20 questions.

21 [The prepared statement of Dr. Scolese follows:]

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1 Chairman Inhofe: Thank you, Dr. Scolese.

2 General Raymond?

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1           General Raymond: Thank you. Chairman Inhofe, Ranking  
2 Member Reed, distinguished members of the committee, thank  
3 you for the opportunity to appear before you today. It is  
4 truly an honor to be nominated by the President to lead  
5 United States Space Command and Air Force Space Command.

6           I am also appreciative of the opportunity to testify  
7 with Dr. Scolese. Our being here together shows just how  
8 critical the relationship between the Department of Defense  
9 and the NRO is today and will be into the future.

10           Chairman Inhofe, if it is okay, I would like to take a  
11 minute to introduce my family that are here with me today.

12 I am an extremely lucky man. I am blessed with such a great  
13 and supporting family. First of all, my beautiful wife  
14 Molly. In a couple weeks, we will celebrate our 32nd  
15 anniversary. Now, Molly has dedicated her life to taking  
16 care of two families, our family and then our Air Force and  
17 joint family. And I will tell you she works tirelessly at  
18 looking after both.

19           Seated next to Molly are our three children, Christina,  
20 Amy, and Gary. Christina and Amy just graduated a year ago  
21 from Iowa State and are both employed, which is a great  
22 thing. Christina is marketing manager in Minneapolis-St.  
23 Paul in Minneapolis, and Amy is a third grade teacher in Des  
24 Moines, Iowa.

25           Sitting next to them is their little brother Gary.

1 Gary is the youngest. Gary just finished his freshman year  
2 at Yale University where he is majoring in economics and is  
3 a tight end for the Yale football team, number 84. Go  
4 Bulldogs.

5 Let me begin by thanking the President and the  
6 Secretary of Defense for nominating me for this position. I  
7 also want to thank the Chairman of the Joint Chiefs, General  
8 Dunford, for expressing his confidence in my ability to lead  
9 and serve as a combatant commander. If confirmed, I look  
10 forward to working closely with this committee and with  
11 Congress to address the complex challenges that we face as a  
12 nation.

13 I will keep my comments brief because I am really  
14 looking forward to the questions.

15 But, first, let me just say there is great alignment in  
16 our nation today that space is a warfighting domain, just  
17 like air, land, sea, and cyber. Our National Security  
18 Strategy reflects this and states that access to and freedom  
19 to maneuver in space is a vital national interest.

20 With this alignment and with the strong support of  
21 Congress, we have accelerated our efforts to meet the near-  
22 term imperatives of this warfighting domain. The scope,  
23 scale, and complexity of the threat to our space  
24 capabilities are real and are concerning. We no longer have  
25 the luxury of operating in a peaceful, benign domain, and we

1 no longer have the luxury of treating space superiority as a  
2 given.

3       Although space is a warfighting domain, our goal is  
4 actually to deter a conflict from extending into space. The  
5 best way I know how to deter that is to be prepared to fight  
6 and win if deterrence were to fail. We are today -- we are  
7 the best in the world, and if confirmed, my job will be to  
8 make sure that that advantage continues well into the  
9 future.

10       The source of our great strength are our airmen,  
11 sailors, soldiers, and marines, and I am privileged to lead  
12 these great Americans, America's sons and daughters who  
13 volunteer to serve their country in times of great need. I  
14 take this responsibility very seriously, and I will assure  
15 you that, if confirmed, I pledge to continue to uphold this  
16 sacred trust to the utmost of my ability.

17       I look forward to your questions.

18       [The prepared statement of General Raymond follows:]

19       [COMMITTEE INSERT]

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1 Chairman Inhofe: Well, thank you very much.

2 Dr. Scolese, in my opening statement, I was initially  
3 concerned with your public statements regarding the  
4 establishment of the United States Space Force and the  
5 responsibility of integration and synchronization with the  
6 NRO. NRO has done such a good job for a long period of  
7 time, and I respect that. But I would like to know the  
8 reason for making that bold statement at that time because  
9 at that time, I do not think you knew the details of the  
10 proposed organization, and what your feeling is at this  
11 time.

12 Dr. Scolese: Senator, I believe it is critically that  
13 the NRO collaborate and cooperate with all elements,  
14 particularly the newly formed Space Command. As part of the  
15 confirmation, General Raymond and I spoke together about  
16 what that would look like. General Raymond informed me that  
17 they have a great relationship between the NRO and the  
18 current Air Force Space Command. I look forward to  
19 continuing that relationship and making it stronger so that  
20 we can serve the nation better.

21 Chairman Inhofe: That is good. That is good. I would  
22 think also that the NRO has proven itself after some 15-plus  
23 years of dedication in the mission force as an outstanding  
24 space system acquisition organization, and keeping the  
25 standards of excellence on track will be a challenge.



1           So, Dr. Scolese, how will you keep the NRO on its  
2 continued path of excellence in designing and acquiring the  
3 system necessary for mission force?

4           The reason I ask the question is that one reason -- I  
5 think a driving reason -- behind the whole idea is to make  
6 sure that our allies and our adversaries, those around the  
7 world know that we are just as active and more active than  
8 our adversaries of China and Russia. I think it is very  
9 important that they see that we are doing this in a  
10 coordinated, concerted effort. Do you have any response to  
11 that? Anyway, what is your idea to keep ourselves ahead of  
12 the group?

13           Dr. Scolese: It is absolutely critical that we  
14 maintain our technological advantage over our adversaries.  
15 The NRO, as I understand it, has the responsibility for  
16 developing end-to-end systems for providing overhead  
17 reconnaissance. And it is critical that we demonstrate to  
18 the world that we are constantly evolving, developing our  
19 systems, and using new technologies working with partners  
20 inside the government and outside the government, commercial  
21 industry to show that we have an increasingly resilient and  
22 capable constellation of systems that can provide overhead  
23 reconnaissance.

24           Chairman Inhofe: Good, and that all of our adversaries  
25 and that everyone understands that that is taking place.

1           General Raymond, the specific AOR we are talking about  
2   to space warfighting domain is an area surrounding the earth  
3   at altitudes equal to or greater than 100 kilometers -- that  
4   is 54 nautical miles above mean sea level. This is an  
5   established standard where space begins. When forces are  
6   deployed in another geographic combatant commander's AOR,  
7   they will remain assigned to and under control of the  
8   Commander of the U.S. Space Command, unless otherwise  
9   directed.

10           So, General Raymond, given the expansive AOR you will  
11   be responsible for, how will you integrate and synchronize  
12   the operations through and from the space warfighting domain  
13   especially with other combatant commanders? Do you see any  
14   kind of a problem or competition with other combatant  
15   commanders that are out there?

16           General Raymond: Thank you for the question, Senator.

17           Absolutely not on the competition. Space is a physical  
18   warfighting domain. I think this recognition of an AOR in  
19   space supports that fact.

20           One of the things that we are doing with the standup of  
21   U.S. Space Command -- and if confirmed, I will work very  
22   hard to do this -- is to integrate more effectively with the  
23   geographic combatant commands around the world. I think  
24   this elevation of the joint force space component commander  
25   to a unified command actually helps that. And if confirmed,

1 one of the plans that we have got that we are working on is  
2 to put integrated planning elements at each of those  
3 combatant commands to allow for that seamless integration  
4 between U.S. Space Command and the other combatant commands.

5 Chairman Inhofe: Yes, and I think both of you have  
6 articulated very well that point, and that is what all of us  
7 on this side of the table are wanting to see to make sure  
8 that we know and that everyone else knows we are going to do  
9 it better than our adversaries.

10 Senator Reed?

11 Senator Reed: Well, thank you very much, Mr. Chairman.

12 Gentlemen, thank you for your testimony.

13 General Raymond, as I indicated in my opening  
14 statement, as the head of the new unified U.S. Space  
15 Command, you have to operate under the Goldwater-Nichols  
16 principles of integration. Yet, the vast majority of your  
17 personnel are U.S. Air Force personnel. How do you plan to  
18 go about that?

19 General Raymond: Thank you.

20 Goldwater-Nichols reorganized, as you know, Senator,  
21 the Department into two functions: an organized train and  
22 equip function and a warfighting function.

23 Today I am here to testify on kind of two hats. The  
24 first hat is an Air Force Space Command hat, which is an  
25 organize, train, and equip hat, and the second hat is a U.S.

1 Space Command hat, which is in that warfighting hat.

2           What I would say to you is that I am convinced that in  
3 the future, if we are going to get into a conflict with a  
4 peer competitor, a near-peer competitor, we are going to  
5 have to fight and win for space superiority. That is going  
6 to require the total force. That is not just the space  
7 fight. That is the full weight of the joint force. Army,  
8 Navy, Air Force, Marines have to come together to do that.  
9 And I am confident that we have got Goldwater-Nichols just  
10 right and that this will feed that going forward.

11           Senator Reed: Just a follow-up. As part of that, you  
12 will be trying to integrate training exercises or perhaps  
13 virtual exercises initially, but ultimately physical  
14 exercises with other service components as part of your  
15 unified command.

16           General Raymond: Absolutely. We do that today and we  
17 will continue to do that in the future. We do that today  
18 under the U.S. Strategic Command unified command.

19           Senator Reed: Very good. Thank you, sir.

20           And, Dr. Scolese, in your responses to the committee's  
21 APQs, you said operational decisions on space events or  
22 space control issues affecting NRO satellites should be made  
23 not by the Commander of U.S. Space Command but by the NRO  
24 Director even during a natural conflict. General Raymond, I  
25 believe provided a different answer, stating that he can see

1 a time when we will need to change the current status quo.

2 So can you two both, beginning with Dr. Scolese,  
3 clarify where we have to head to have a coordinated response  
4 particularly in a conflict situation?

5 Dr. Scolese: I believe it is absolutely imperative  
6 that we work together and that we train and work together so  
7 that when we do end up in a conflict situation, that we know  
8 how we are going to operate and we know who is going to  
9 operate and that we have to simply do that together. So I  
10 am committed, if confirmed, to working with General Raymond  
11 and U.S. Space Command to make sure that we have a  
12 coordinated effort, understand what each other's roles and  
13 responsibilities are, and execute them effectively,  
14 dependent on the particular situation that we are involved  
15 in.

16 Senator Reed: Typically at some point, particularly in  
17 a stressful period of time, someone has to have the last  
18 word because you can coordinate as much as you want, but  
19 there might be a difference of opinion. Do you maintain the  
20 NRO Director should have the last word in terms of  
21 deployment at all times?

22 Dr. Scolese: I think it depends on the situation. So  
23 I would not say at all times, but I think it depends very  
24 much on the situation that you are involved in.

25 Senator Reed: General Raymond, your comments.

1           General Raymond: Thank you.

2           The UCP's change that establishes the missions for U.S.  
3   Space Command is pretty clear. It states that protecting  
4   and defending U.S. and, as directed, allied partner and  
5   commercial space capabilities is the responsibility of the  
6   U.S. Space Command Commander. Today we work very closely  
7   with the NRO. The relationship has never been better. And  
8   today, on a day-to-day effort, we operate at what we call  
9   unity of effort. I am convinced that as we stress this and  
10   as we go forward to higher states of readiness and the  
11   exercises in your previous question, that we need to make  
12   sure that that unity of effort is the proper relationship at  
13   level to be able to protect and defend those capabilities.

14           SPD-4, the Space Policy Directive 4, directs the  
15   departments to come back together with recommendations, and  
16   we will test that and bring that back as part of the SPD-4  
17   process.

18           Senator Reed: I have very few seconds remaining, but  
19   20 years ago, General Eberhart commented that he did not  
20   think the acquisition process was well coordinated between  
21   NRO and Space Command at the time. I alluded to, in my  
22   opening statement, the proposals by DOD to acquire  
23   commercial satellites and to put up a whole constellation of  
24   these relatively inexpensive -- the NRO opposed, I think,  
25   that proposal. This might be something we will have further

1 conversations on.

2 But, General Raymond, do you see your role as being  
3 able to develop and launch satellites in cooperation with  
4 but not exclusively through NRO?

5 General Raymond: I do. We have actually made some  
6 progress on this in the last couple years. We had a  
7 satellite program that we were going to launch from the Air  
8 Force. In my current Air Force hat, it was the follow-on to  
9 a space surveillance satellite. And it turned out, when we  
10 did the analysis, that that satellite was not going to meet  
11 mission needs. The NRO had a satellite that they were  
12 building that when we did the analysis, said that is exactly  
13 what we need. So we canceled that program and partnered  
14 with the NRO and combined efforts to be able to do that,  
15 getting a capability on orbit faster for a better value for  
16 the American taxpayer.

17 So, if confirmed, I will continue that effort. I think  
18 there is great partnership to be had, and we need to  
19 leverage each other's capabilities, depending on the  
20 capability that we are developing.

21 Senator Reed: But there may be occasions where DOD  
22 satellite programs would be more effective for the  
23 warfighter, and if you felt that way, you would try to  
24 insist upon it?

25 General Raymond: I would insist on a great working

1 relationship. What I have learned in my current position  
2 over the last 2 and a half years, that when the Air Force  
3 and the NRO come in in lockstep, we are hard to beat, and  
4 when we come in separated, we do not do as well.

5 Senator Reed: Finally, for the record, I am going to  
6 give you your chance. You had a shout-out for the Bulldogs.  
7 Do we not owe one to the Cyclones?

8 General Raymond: The Cyclones.

9 Senator Reed: Thank you.

10 Chairman Inhofe: Thank you, Senator Reed.

11 Dr. Scolese: Can I give a shout-out the Clemson Tigers  
12 too? That is where I went.

13 [Laughter.]

14 Chairman Inhofe: Senator Cotton?

15 Senator Cotton: Gentlemen, thank you for your  
16 appearance, and congratulations on your nomination.

17 General Raymond, I want to go back to a couple of  
18 comments you made in your opening statement. You said that  
19 we can no longer assume that space will be a peaceful and  
20 benign domain. You further said that we can no longer take  
21 for granted space superiority.

22 Let me ask you a basic question that I think a lot of  
23 Americans who hear this testimony would answer -- or would  
24 ask. How did this happen? How did we get to this point?

25 General Raymond: We are the best in the world at



1 space. Some refer to Desert Storm as the first space war.  
2 It is the first war where we took space capabilities and  
3 integrated them into the fight. Basically my whole career  
4 has been spent integrating those space capabilities. They  
5 provide our nation great advantage. They provide our joint  
6 warfighters great advantage. There is nothing that we do as  
7 a joint warfight that is not enabled by space.

8       Unfortunately, our adversaries have had a front row  
9 seat into our many successes and have seen the advantages  
10 that they provide us, and to be honest, they do not like  
11 what they see. And they are rapidly capabilities to negate  
12 our use of space and to negate the advantage that space  
13 provides.

14       Senator Cotton: We talk about near-peer competitors,  
15 and you just said our adversaries. But we live in a world  
16 with nations and those nations have names and they live in  
17 specific places. What are those countries that have made  
18 these strides over the last 30 years?

19       General Raymond: There is a full spectrum of  
20 capabilities for counter-space capabilities, everything from  
21 low-end reversible jamming to high-end direct ascent ASATs.  
22 The low-end reversible jamming piece is spread out about a  
23 few more nations, but the really concerning nations that  
24 have the ability to kinetically destroy our satellites would  
25 be Russia and China.

1           Senator Cotton: Is it fair to say that China in  
2 particular looked at what we did in 1991, amassing troops  
3 for several months on the border of what was then the  
4 country of the world's fourth largest army using space and  
5 information technology and said, we will never let that  
6 happen to us?

7           General Raymond: I think it is fair to say that China  
8 has been watching and understands how we integrate space to  
9 great effect.

10          Senator Cotton: You talked a little bit about the  
11 capabilities there. Could you just explain in kind of plain  
12 language what those capabilities are, what their space  
13 weapons, to put it in plain language, would be?

14          General Raymond: I will put it in plain language, and  
15 in a closed hearing, I can go into a lot more detail.

16          But everything from reversible jamming of GPS  
17 satellites that our nation relies on and our joint force  
18 relies on, communications satellites, our ability to  
19 communicate across vast distances -- they can jam those  
20 communication satellites. They have the ability, as  
21 demonstrated by China in 2007, to launch a missile from the  
22 ground and destroy one of their own satellites. It blew  
23 that satellite up into about 3,000 pieces of debris.

24          There is also concerning activities on orbit, and there  
25 is also directed energy threats.

1           So there is a full spectrum of threats, and I will tell  
2 you the scope, scale, and complexity of those threats are  
3 alive and well.

4           Senator Cotton: Can you say more about what you mean  
5 by concerning activities on orbit?

6           General Raymond: I would prefer to do that in a closed  
7 hearing.

8           Senator Cotton: Directed energy is a fancy term for  
9 lasers?

10          General Raymond: Yes, sir.

11          Senator Cotton: It sounds like a pretty dire threat.

12          General Raymond: It is a threat that is concerning,  
13 and that is why this committee's work to determine -- and I  
14 appreciate the focus on this committee that you put onto  
15 this issue. It is really important that we make some  
16 changes to stay ahead of that growing threat. I am  
17 comfortable today. I am comfortable we are the best in the  
18 world. But we need to move fast, and with your support, we  
19 are going to get there.

20          Senator Cotton: Thank you.

21          I asked you those questions not because this committee  
22 is not aware of them, but I know that there are other  
23 Senators who may not be and certainly a lot of the American  
24 public who does not recognize just how serious the threat is  
25 from China in particular, but also Russia in space and that

1 every single soldier, sailor, airman, marine, and Coast  
2 Guard on the ground or in the air depends on our space  
3 superiority.

4 Dr. Scolese, if I could turn to you here towards the  
5 end of my time. At NASA, you have been a proponent of  
6 inserting a lot of cutting-edge commercial technology into  
7 programs. Could you talk a little bit about your experience  
8 in doing so and assess the risks and benefits of building  
9 partnerships with private industry to accomplish the NRO's  
10 mission and to the extent you see those risks, what you can  
11 do to mitigate them?

12 Dr. Scolese: Certainly. I see principally benefits.  
13 The commercial sector is developing some technologies and  
14 adopting some technologies that will allow us to bring to  
15 bear capabilities that can fill gaps, improve our resiliency  
16 by providing similar information if it is needed.

17 At the same time, I think that commercial we have seen  
18 has given us an opportunity also to lower the cost. We have  
19 been very successful in buying, I will call it, off-the-  
20 shelf spacecraft. There is no real such thing as off-the-  
21 shelf spacecraft, but spacecraft developed by the commercial  
22 industry that have proven to be very effective in terms of  
23 performance, and therefore, it has reduced the cost of our  
24 systems and reduced the time to delivery so that the  
25 government can focus on the exquisite instruments that are

1 needed to go off and measure whether it is space activities  
2 or ground activities on earth.

3 At the same time, we have to recognize that there are  
4 challenges. We have to understand where the supplier base  
5 is, that intellectual property is being protected, and that  
6 the information that we provide is protected in a useful  
7 way. It can all be done very effectively with a good  
8 acquisition process that I believe NASA has and the NRO has  
9 as well.

10 Senator Cotton: Thank you, gentlemen.

11 Chairman Inhofe: Thank you, Senator Cotton.

12 Senator King?

13 Senator King: Thank you, Mr. Chairman.

14 You two gentlemen have spoken repeatedly this morning  
15 about coordination, cooperation, working together, a good  
16 relationship. Could you go a little bit further and  
17 characterize the relationship? Is it vendor-customer? How  
18 responsive is NRO to the needs of the Department of Defense?  
19 I want a little more specificity about how this actually  
20 works. Are there weekly meetings? And to reprise one of  
21 Senator Reed's questions, what happens if there is a  
22 disagreement? Dr. Scolese?

23 Dr. Scolese: If confirmed, I will certainly look into  
24 the specific details. My understanding right now is that  
25 the relationship, as General Raymond has mentioned, is very

1 good and getting better.

2 Senator King: But I want to know what that really  
3 means. You got to give me more than that. Is it weekly  
4 telephone conversations? Is it exchanges of memos? Telling  
5 me that the relationship is good does not tell me how it  
6 really works.

7 Dr. Scolese: If confirmed, I will get the absolute  
8 details of it. My understanding right now is that there are  
9 regular meetings. I do not know the specific frequency of  
10 those meetings.

11 Senator King: Do you view the Department of Defense as  
12 your customer?

13 Dr. Scolese: Pardon?

14 Senator King: Do you view the Department of Defense as  
15 one of your customers?

16 Dr. Scolese: Absolutely. The NRO is responsive to the  
17 needs of the Department of Defense and the intelligence  
18 community. That tasking and the requirements come from the  
19 functional managers from other agencies, the CIA, the  
20 National Geospatial Imaging Agency, the National Security  
21 Agency, and others to develop those requirements that work  
22 collaboratively to understand what can and cannot be  
23 accomplished and then move out and either develop the system  
24 or implement the taskings as agreed to through those  
25 activities.

1           Further, there are other activities that I am aware of  
2 where NASA participates with the NRO and the Air Force and  
3 the Department of Defense where we all work together to  
4 understand the supplier base, the utilization of the ranges,  
5 launch vehicle procurement and operation. Those happen  
6 regularly, typically two or three times a year to have those  
7 meetings. So there is a lot of coordination that goes on as  
8 just part of the natural system that I am aware of.

9           Senator King: Well, my second question was going to be  
10 about if we are trying to unify and consolidate and  
11 rationalize the space enterprise, why not just fold NRO in.  
12 But I think in part you answered it in your prior answer.  
13 You have other customers. You have the CIA. You have the  
14 intelligence community. You have to work with NASA.

15           General Raymond, your thoughts about, number one, how  
16 the relationship actually works, and number two, whether you  
17 are satisfied with NRO as your vendor.

18           General Raymond: We are completely integrated. It is  
19 not a relationship of let us have a meeting. We operate in  
20 the same operations center. We talk routinely every second  
21 of the day. Over the last couple years, we have built a  
22 strategy we cosigned between us and the NRO. We have built  
23 concept of operations that we cosigned between us and the  
24 NRO. We share programs. We share organizations.

25           Senator King: Have there been cases where you have

1 requested a capability and NRO says, no, we cannot do that  
2 or we will not do that or we cannot afford it?

3 General Raymond: In my experience in my current role  
4 as the Air Force Space Command Commander and the Joint Force  
5 Space Component Command Commander, I have not experienced  
6 that.

7 Senator King: I think that is important. To me that  
8 speaks to the fact that there really is a relationship.

9 General Raymond: It is the best it has ever been. But  
10 I will tell you, Senator -- if confirmed, I will commit to  
11 this -- as good as it is, it needs to continue to get  
12 better. And I look forward to working with Dr. Scolese if  
13 we are both confirmed in these positions. It is nationally  
14 critical. We have to come in as a united front here.

15 Senator King: And it is critical not only in terms of  
16 the Department of Defense and the Space Command, but it is  
17 also critical in terms of the relationship with the  
18 intelligence community because that is part of the essence  
19 of what these satellites provide. Is that correct, Dr.  
20 Scolese?

21 Dr. Scolese: Yes, sir.

22 Senator King: I am tempted to ask as my last question,  
23 what was Hyman Rickover really like? I understand you  
24 worked with him early in your career.

25 Dr. Scolese: I did, indeed. Yes. He selected me for



1 the nuclear Navy. He was an admiral. I was an ensign. So  
2 you can imagine. He was a legend. I was not. So you can  
3 imagine the relationship. But he was a great person to work  
4 for, and I would be glad to share some stories with you,  
5 sir, when you have some time.

6 Senator King: I would like to know what lessons were  
7 learned by one of the giants of our military history.

8 Thank you very much, gentlemen. Thank you for your  
9 service.

10 Thank you, Mr. Chairman.

11 Chairman Inhofe: Thank you, Senator King.

12 Senator Scott: First, thanks to each of you for your  
13 service.

14 What experience have you had where China is stealing  
15 intellectual property? Is that happening constantly? Are  
16 we able to stop it? What has been your experience?

17 General Raymond: Sir, my experience is that China is  
18 stealing our property. My thoughts are this is a national  
19 imperative that we do something to stop this. We are ceding  
20 our operational advantage if we do not. In my current job,  
21 I have put together a strategy with my team to try to stem  
22 the tide of that, reduce the targeting footprint, if you  
23 will, putting it in joint warfighting terms, making sure  
24 that our contracts have the right languages in to make sure  
25 that we have the right protections in place. And then there

1 are some other things that I would talk to you in a closed  
2 hearing about. But it is of great importance to our nation  
3 that we address this.

4 Senator Scott: So they are constantly doing it.

5 General Raymond: That would be my answer. Yes, sir.

6 Senator Scott: So when I joined the Navy, probably the  
7 first thing they kept telling me as an E-1 was the chain of  
8 command. You really feel like between the NRO and the U.S.  
9 Space Command there is really -- somebody is in charge?  
10 There are no ifs, ands, or buts about it. Somebody knows  
11 who is going to be responsible?

12 Dr. Scolese: My experience -- again, I am not in the  
13 NRO right now, but from NASA is in a unity of effort, it is  
14 very important to work closely together and understand what  
15 each organization's responsibilities are and depending on  
16 the situation, knowing who takes the lead in that particular  
17 activity. And that comes from lots and lots of training.

18 We do that regularly at NASA. Most of our stuff is  
19 unity of effort as we work with other organizations,  
20 including the Air Force and the NRO, but also universities  
21 and other countries to go off and take advantage of their  
22 capabilities so that we can enhance our capabilities and  
23 their capabilities. And I found that training,  
24 understanding, as General Raymond mentioned earlier,  
25 constant integration and working together to make sure that

1 we understand those. And it has proven to be effective.

2 Senator Scott: And you feel the same way, General?

3 General Raymond: The way I describe it, Senator, is  
4 there is there is kind of two circles. NRO has their  
5 mission set, and we have our mission set, and the threat is  
6 bringing those circles together in that overlap of protect  
7 and defend. We know exactly. We have a CONOPS on how we  
8 are going to operate. We have an organization jointly  
9 manned that focuses on that. We exercise together. We  
10 train together. We war game together.

11 And I am comfortable today, but I will tell you, as I  
12 mentioned to the committee before, we need to continue to  
13 stress it. We need to continue to exercise this at higher  
14 states of readiness and to make sure that that works. And I  
15 am committed, if confirmed, to continue that and work very  
16 closely with my leadership, with the National Reconnaissance  
17 Office, and with this committee to make sure that we have  
18 that right going forward.

19 Senator Scott: Do you guys feel comfortable, if both  
20 of you are confirmed, that you know exactly what your  
21 responsibility is so at the end of 12 months, you can say  
22 whether you succeeded or not?

23 Dr. Scolese: I believe so.

24 General Raymond: I am very confident in that, Senator.

25 Senator Scott: And do you believe that Congress has

1 given you all the tools you need and the direction you need  
2 to be able to fulfill your mission?

3 Dr. Scolese: To the best of my understanding, yes.

4 General Raymond: Senator, with the support of Congress  
5 over the last 3 years, we have seen significant budget  
6 increases focused on space. I appreciate it. It is an  
7 imperative that we get this right, and I am comfortable that  
8 we have got the resources we need to protect and defend  
9 these critical capabilities.

10 Senator Scott: Thanks to both of you for your service.

11 Chairman Inhofe: Thank you, Senator Scott.

12 Senator Peters?

13 Senator Peters: Thank you, Mr. Chairman.

14 And to both of you, I appreciate your service.

15 General Raymond, when this committee held a hearing in  
16 April to consider the creation of the U.S. Space Force, I  
17 expressed some concerns to General Dunford that I had  
18 regarding the creation of the Space Force and that it would  
19 consolidate all space equities basically into a single force  
20 provider.

21 Like Senator Reed, I certainly want to ensure the  
22 integrity and the principles of Goldwater-Nichols, that they  
23 are preserved and that the force provider and combatant  
24 command work together to foster a joint environment, which  
25 is absolutely critical.

1           And while the Air Force has a preponderance of space  
2     equities, it is important to remember that the U.S. Army is  
3     the largest user of space capabilities and needs the  
4     understanding of all of the services for something that is  
5     going to be very important to your work going forward.

6           During the hearing, General Dunford responded to my  
7     question by stating -- and I think this is a quote -- I  
8     think it is imperative on the joint force to make sure that  
9     in force development, force design, and command and control  
10    and on our planning we leverage that diversity that each of  
11    our services bring.

12          So, if confirmed, my question for you, General Raymond,  
13    specifically how will you design and develop your force  
14    structure plan to leverage space equities from each of the  
15    services, and specifically how would a potential Space Force  
16    impact the planning that you are going to be doing?

17          General Raymond: First of all, space is a joint  
18    warfighting business. You have to have joint integration.  
19    We have that today with U.S. Space Command, which is the  
20    command I have been nominated for. We will have service  
21    components. Army, Navy, and the Air Force and Marines  
22    service components will be a part of that. They have  
23    operators in each one of those services. They develop  
24    capabilities that are integral to their service. They  
25    develop warfighters that understand how to take the space

1 capabilities that other services operate and integrate them  
2 to great effect.

3 And my view is that with the standup of U.S. Space  
4 Command, you actually strengthen the joint requirements hand  
5 of the commander. And if confirmed for that position, my  
6 role and joint requirements would be elevated and would be  
7 very instrumental in ensuring that joint integration. We  
8 cannot win this fight without the full joint team.

9 Senator Peters: General Raymond, I would also like to  
10 ask a question about doctrine. The space domain has  
11 traditionally provided logistical support for other domains  
12 such as GPS and surveillance, as you are well aware. But  
13 our strategic vision of space has certainly evolved a great  
14 deal due to great power competition. So I am interested to  
15 hear how you plan to approach this shift in mindset and  
16 prepare our space assets for a more tactical role in  
17 warfare.

18 So the question is, what is your underlying  
19 warfighting-- or what is, I should say, the underlying  
20 warfighting doctrine for how we plan to operate in space  
21 given this new environment?

22 General Raymond: So I agree with your question up  
23 front that historically we have been operating in a benign  
24 domain, and the doctrine that we had today over the past  
25 years has all been about providing services in a benign

1 environment to the joint warfighter and our nation. That is  
2 no longer good enough.

3         So under U.S. Strategic Command's leadership, who is  
4 the combatant commander today responsible for space, we have  
5 worked to revise that doctrine to get after the warfighting  
6 aspects of it. It is no longer good enough just to launch a  
7 satellite, get it on orbit, and work the integration piece.  
8 You have to be able to protect and defend it, and you have  
9 to be able to fight it. And that requires a different  
10 doctrine that is being developed today. And if confirmed as  
11 the U.S. Space Command Commander, our command would be  
12 working that and continuing to mature that going forward.

13         Senator Peters: That is a work in progress but one  
14 that you need to focus on, clearly.

15         General Raymond: Yes, sir.

16         Senator Peters: How should U.S. Space Command  
17 coordinate with allies as other combatant commanders do now?

18         General Raymond: Sir, allied partnerships are critical  
19 for space. Historically we have not had to worry about that  
20 as much because it was a benign, peaceful domain. That is  
21 not the case today. And so we are working really, really  
22 hard to develop those partnerships.

23         Over this past year, we transitioned our C2 center from  
24 a joint operations center to a combined space operations  
25 center where we have allies on the operations floor with us.

1 We have increased the training opportunities for allied  
2 partners. We train, we exercise, and we war game together,  
3 and we have worked some acquisition partnerships where we  
4 are putting hosted payloads on allied satellites to provide  
5 capability faster and cheaper to the warfighters and to our  
6 nation.

7 So that is a big emphasis area. I am extremely pleased  
8 with the advances that we have made, but we still have a lot  
9 of work to do.

10 Senator Peters: Great. Thank you.

11 Chairman Inhofe: Thank you, Senator Peters.

12 Senator Hawley?

13 Senator Hawley: Thank you, Mr. Chairman.

14 Thank you, gentlemen, for being here. Congratulations  
15 on your nominations.

16 General Raymond, let me just start with you and let me  
17 pick back up where Senator Peters was just asking, or where  
18 he started at least, about conflict in space and about the  
19 operational concepts for that.

20 As you develop those operational concepts, in light of  
21 the National Defense Strategy -- actually let me just ask  
22 that question. I assume that operational concepts for  
23 conflicted space will be developed in light of the National  
24 Defense Strategy and the priorities placed there upon great  
25 power competition particularly with China. Is that



1 accurate? Is that fair to say?

2 General Raymond: That is accurate.

3 Senator Hawley: As you do that, how will SPACECOM  
4 ensure that it is facilitating and not inhibiting joint  
5 cross domain concept development?

6 General Raymond: I think it actually facilitates. I  
7 think if you look at what the role of a combatant commander-  
8 - with the elevation to a combatant commander that is  
9 singularly focused on the space domain, not treating it as a  
10 second or third priority, but singularly focused and  
11 elevating that to the combatant command level provides the  
12 opportunity to influence joint requirements, influence joint  
13 doctrine, influence joint CONOPS. And I think that is one  
14 of the strengths of standing up this U.S. Space Command.

15 Senator Hawley: Let me ask you more specifically. The  
16 Department of Defense's Indo-Pacific Strategy report was  
17 released last Friday, and it refers a number of times to the  
18 fait accompli scenario. And in particular, it calls it the  
19 most stressing potential scenario that is likely to confront  
20 the joint force if an adversary does choose to use force to  
21 advance strategic ends.

22 What unique stresses or requirements would you expect  
23 an attempted fait accompli to impose on our Space Forces,  
24 and how would you plan to ensure those forces are postured  
25 appropriately to address that kind of a threat?

1           General Raymond: I think it is clear, Senator, that  
2 China in the case of the Pacific has observed how we go  
3 about integrating space into joint operations. And there is  
4 nothing that we do today in the Pacific region from  
5 humanitarian assistance to higher-end conflict that is not  
6 enabled by space. Historically we have not had to worry  
7 about protecting those capabilities. That is not good  
8 enough today.

9           We are working very closely today through U.S.  
10 Strategic Command and INDOPACOM to do planning together,  
11 exercising together, and making sure that we provide as a  
12 supported commander to INDOPACOM the capabilities that they  
13 need. And if confirmed in this job, that will be the role  
14 of U.S. Space Command as well to continue working with  
15 INDOPACOM towards that end.

16           Senator Hawley: Very good.

17           Let me ask about satellites. They obviously play a  
18 crucial role in our nuclear deterrent providing, of course,  
19 a range of functions from early warning to command and  
20 control. If you are confirmed, how would you plan to  
21 coordinate with STRATCOM to ensure our nuclear forces  
22 maintain access to those functions?

23           General Raymond: U.S. Space Command and U.S. Strategic  
24 Command will have a strong partnership from the day this  
25 command is established out into the future. Especially

1 early on as we establish this command, this command will be  
2 reliant on capabilities from U.S. Strategic Command as the  
3 command builds from establishment to IOC.

4 I think space capabilities, talking about deterrence,  
5 provides additional deterrence options to change the  
6 fundamental deterrence calculus of denying benefits and  
7 imposing costs. I view that deterrence calculus and that  
8 conversation will require very strong consultation with U.S.  
9 Strategic Command. And every single combatant commander in  
10 our nation has a UCP mission for deterrence, and that  
11 integration of those into 21st century deterrence is going  
12 to be critical.

13 Senator Hawley: Can you just say something more,  
14 General, about the deterrent role and what in particular you  
15 bring to the table on that? I mean, how do you see your  
16 role there in ensuring that deterrent?

17 General Raymond: If confirmed as the U.S. Space  
18 Command Commander, my role will be to carry out the UCP  
19 missions that the President has assigned. Those missions  
20 include making sure that I can protect and defend those  
21 capabilities. If we can do that -- and we will. We can do  
22 that today, and we will do that in the future, if confirmed.  
23 That in itself can help change the calculus of an adversary.

24 Senator Hawley: Let me just ask you, still on the  
25 topic of satellites, but thinking now about cyber attacks,

1 we know that even though satellites are located obviously  
2 physically in space, they are vulnerable to cyber attacks  
3 through ground control networks or nodes. How do you plan  
4 to coordinate with CYBERCOM to deter or respond to a  
5 potential cyber attack?

6 General Raymond: Protecting and defending space  
7 requires you to protect the space asset, the ground asset,  
8 and the link in between. And so the relationship between  
9 U.S. Space Command and U.S. Cyber Command will be critical.  
10 We are planning to embed an integrated planning element at  
11 U.S. Cyber Command to make sure that we can work very  
12 closely on the cyber defenses for space. And if confirmed,  
13 I will pledge that I will work extremely closely with  
14 General Nakasone towards that end as we move forward.

15 Senator Hawley: Very good. Thank you, General.

16 Thank you, Mr. Chairman.

17 Chairman Inhofe: Thank you, Senator Hawley.

18 Senator Shaheen?

19 Senator Shaheen: Thank you, Mr. Chairman.

20 And, Dr. Scolese and General Raymond, congratulations  
21 to both of you on your nominations and thank you for your  
22 willingness to continue to serve and to your families for  
23 that willingness.

24 Dr. Scolese, under your watch at NASA, you have seen  
25 two very large, complex programs balloon out of control for

1 both cost and schedule: the National Polar-orbiting  
2 Environmental Satellite System, or NPOESS, and the James  
3 Webb Space Telescope. Now, eventually NPOESS was dissolved  
4 and the Joint Polar Satellite System is now providing  
5 operational weather information. But Webb's development  
6 cost is now \$8.8 billion, and it will not be launched until  
7 2021.

8         So can you talk about what lessons you have learned  
9 from both of those experiences and how you can share some of  
10 what you have learned in this new role and whether there are  
11 any lessons for NASA that you think we should be looking at  
12 as you transition to a new position?

13         Dr. Scolese: Certainly, Senator. In fact, one of the  
14 things that I did when I was the chief engineer at NASA was  
15 to go off and look in detail as to what was causing cost  
16 overruns and delays. Unfortunately, both JWST and NPOESS  
17 were programs that had started well before I had started  
18 that study. When we completed it, we had developed nine  
19 guidelines, if you will, strong lessons learned, that we  
20 have employed on various programs, partially on the JPSS  
21 program and partially on the James Webb Space Telescope, but  
22 entirely on programs that started after 2010.

23         Our success on those programs has been very good. The  
24 recent GAO report even recognizes that programs after about  
25 2010-2011 have come in on cost and on schedule. Some of the

1 things that we had determined that were absolutely critical  
2 and we brought forward is a clear understanding of the  
3 requirements and the capabilities of the systems and getting  
4 an agreement early on with the requirements organization and  
5 the developing organization as to what can be done.

6 Senator Shaheen: I am going to run out of time, but  
7 what I would like to do is submit some questions for the  
8 record relative to this --

9 Dr. Scolese: Certainly. I will be glad to do that.

10 Senator Shaheen: -- so that you can answer those and I  
11 can get a little more information.

12 But one corollary is I know that some of the questions  
13 or the problems were due in part to poor workmanship on the  
14 James Webb. So one question that I have is to what extent  
15 is the workforce prepared to do the job that we are asking  
16 them to do on some of these NASA programs, the space  
17 programs.

18 Dr. Scolese: I understand. Yes.

19 It is something that we are concerned about, and it is  
20 something that we have deployed more people into the  
21 facilities. We have worked with the companies to make sure  
22 that the proper training is being applied and we are  
23 applying that in our contractual mechanisms, as well as in  
24 our oversight mechanisms. And at the same time, since we at  
25 the Goddard Space Flight Center build things, we are looking

1 at our training programs and our qualification programs to  
2 assure that we have a highly trained and capable workforce.

3 Senator Shaheen: Well, thank you. I think this is  
4 going to be a challenge as we look at setting up a new Space  
5 Force as well. So we need to think about what lessons we  
6 have learned and how to do it better as we look at the  
7 future.

8 General Raymond, as you know, our States are at the tip  
9 of the spear in terms of responding to disasters whether  
10 they are natural or manmade, and we rely on the National  
11 Guard to help us in addressing that, just as our military  
12 has increasingly relied on the Guard for the last decade.

13 So a number of those States have Guard units, 16 of  
14 them, that currently perform space missions in eight States.  
15 I was pleased that the committee-approved NDAA acknowledges  
16 that the National Guard will have a role in a Space Force,  
17 and I wonder if you can talk about how important it is for  
18 us to ensure that the Guard has a role in the new Space  
19 Force.

20 General Raymond: It is extremely important. Today in  
21 my current hat in Air Force Space Command and as the Joint  
22 Force Space Component Command, we rely, as you said,  
23 Senator, very heavily on both the Air National Guard and the  
24 Air Force Reserve forces. That is going to continue into  
25 the future. They operate really critical capabilities.

1 They provide a capacity, a resource capacity as well, and we  
2 are going to be relying on them for years into the future.  
3 They are seamlessly integrated.

4 Senator Shaheen: Thank you. Well, I am out of time.  
5 So I will ask you this again, about the challenges of how we  
6 actually implement that in a way that is effective.

7 Chairman Inhofe: Thank you, Senator Shaheen.

8 Senator Blackburn?

9 Senator Blackburn: Thank you, Mr. Chairman.

10 And thank you to each of you for being here and  
11 congratulations to you on your nominations and your careers.  
12 And it is always wonderful to see your families when they  
13 come in to be with you during this.

14 I am pleased that Senator Shaheen mentioned the  
15 acquisitions and procurement process. And, Dr. Scolese, you  
16 and I had a great conversation about this yesterday and the  
17 importance of changing some of those protocols. And I will  
18 pick up right where she left off because I think it is  
19 important to inform the record of how you would use some of  
20 your experiences and the team process that you developed on  
21 looking at acquisitions to have a broader effect, if you  
22 will, on Space Force. So if you want to elaborate for just  
23 a few seconds on that, I think it would be helpful to the  
24 record.

25 Dr. Scolese: Yes, Senator.



1           One of the things that we do at the Goddard Space  
2 Flight Center is we have end-to-end responsibility from the  
3 development of the concept to the end of life of the  
4 mission. And that affords us an opportunity to create teams  
5 that can look across the spectrum and find the best way to  
6 achieve the mission in terms of achieving the requirements  
7 that are desired and in meeting the cost and schedule goals.  
8 I believe bringing that concept, which is largely there at  
9 the NRO from my experience in working with the NRO, and the  
10 lessons that we have learned working on multiple different  
11 spacecraft and designs can help us further improve the  
12 acquisition process.

13           Senator Blackburn: I appreciate that, and I think  
14 looking for those efficiencies, those streamlinings, and of  
15 course, helping these projects come in on time and either on  
16 or under budget is important to the process because it  
17 enables us to do more and to speed some of the R&D that is  
18 languishing and needs to be done.

19           We also discussed robotics and the utilization of  
20 robotics for satellite maintenance and some of your lessons  
21 that have been learned from dealing with offshore oil wells.  
22 To inform the record, I wish you would speak for a moment  
23 about those.

24           Dr. Scolese: Certainly. We have used robotics at NASA  
25 for a variety of activities from building the Space Station

1 to servicing the Hubble Space Telescope. I guess I should  
2 say the other way around: from servicing the Hubble Space  
3 Telescope to building the Space Station. And it has been  
4 very successful, but it has been a collaboration between  
5 humans and robotics.

6 We are now looking at using purely robotic systems to  
7 go off and do that and to work with industry to transfer  
8 that technology, which is developing a commercial capability  
9 that we are very pleased to see. And at the same time, we  
10 are advancing that capability to assure that the United  
11 States stays in the lead in robotics and space robotics in  
12 particular.

13 Senator Blackburn: Well, and keeping that lead,  
14 whether it is dealing with the robotics in the maintenance  
15 or looking at Space Command -- and General Raymond, I want  
16 to come with you on this -- because as we consider those  
17 components, the robotics, as we consider the development of  
18 Space Command, the linkage and interoperability that is  
19 going to be necessary with CYBERCOM, as you well said,  
20 earth, space, and the link between and keeping that secure,  
21 we need to look at recruitment and retention and  
22 sustainability. And we have in Tennessee the Arnold  
23 Engineering and Development Complex. And we have discussed  
24 this issue of retention and recruitment with them.

25 So, General Raymond, tell me what you are going to do

1 first and foremost to make certain that we are not only  
2 retaining talent and continuing to train talent but  
3 recruiting talent.

4 General Raymond: Yes. Thank you, Senator. That is a  
5 great question.

6 I think over the last couple years, the focused  
7 discussion and the national interest on space has really  
8 elevated the conversation. We have people knocking on our  
9 door wanting to come work for us. They see great  
10 excitement. You have -- and this is a bad term to use in  
11 the space business -- but an explosion of commercial space  
12 capabilities that are being developed and they are excited  
13 about it. And so I am not concerned today with being able  
14 to recruit. In fact, I see the trend going in a very  
15 positive direction.

16 Senator Blackburn: Awesome. We hope you keep that up.

17 I noted some of the media coverage this weekend with  
18 Operation Rocket, which is some of the college students  
19 gathered in Tennessee, Mr. Chairman, and they were trying to  
20 get a rocket up and off the ground. And I like seeing that  
21 ingenuity and that curiosity at work.

22 I thank you both, and I yield my time.

23 Chairman Inhofe: Thank you, Senator Blackburn. Very  
24 explosive questions.

25 Senator Jones?

1           Senator Jones: Thank you, Mr. Chairman. I appreciate  
2 the opportunity here.

3           General Raymond, I got to be honest with you. You were  
4 on a good roll with me until you mentioned Clemson.

5           [Laughter.]

6           Senator Jones: It happens every time when I get a  
7 Clemson graduate, but that is okay. I understand. I have  
8 had my share of shout-outs.

9           Thank you so much, though, to both of you for your  
10 service. I really appreciate it and your testimony.

11          General Raymond, I do want to follow up a little bit  
12 with what Senator Shaheen talked about with the Guard units.  
13 As you are aware, especially having spent so much time down  
14 at Maxwell Air Force Base, we have got some Guard and  
15 Reserve units in Alabama that are doing some critical space-  
16 based missions.

17          In October, you issued a memo about prioritized Air  
18 Force Reserve components, in which you indicated a desire to  
19 allocate space control squadrons into the Guard. Can you  
20 just elaborate a little bit on that and what your plans  
21 might be for those Guard units, just kind of following up  
22 more information on what Senator Shaheen said?

23          General Raymond: So in my current role as the Air  
24 Force Space Command Commander and the Joint Force Space  
25 Component Command Commander, we operate space control

1 capabilities. On the active duty side, they are very  
2 limited in numbers. And so we were seeking to increase the  
3 capacity. I think it is a perfect mission for the Guard to  
4 do.

5 We have expanded that mission set to four different Air  
6 National Guard squadrons today over this past year, and we  
7 will -- and this is one of the benefits of again elevating  
8 space to a unified combatant command. As we develop those  
9 requirements for those capabilities with our geographic  
10 combatant command partners and we look to build capacity,  
11 there will be more requirements that the Guard will be able  
12 to operate.

13 Senator Jones: As this whole Space Command gels, so to  
14 speak, you are going to be looking at headquarters and  
15 different things. What are the requirements? What criteria  
16 are you looking at for a permanent establishment of the  
17 Space Command headquarters? What criteria?

18 General Raymond: Yes, sir. So you look at the  
19 planning that STRATCOM has led for the establishment of this  
20 command. There are really four big mission areas that the  
21 command will be focused on, four priorities up front. And  
22 obviously, we will work with the chain of command, if  
23 confirmed, and with this committee to help shape those  
24 priorities.

25 But the four priorities going into it would be to

1 deter-- deterrence. We do not want to get into a fight that  
2 extends into space. To be able to deliver capabilities to  
3 the joint warfighter, to be able to defend and protect and  
4 defend those capabilities, and then to be able to develop  
5 warfighters. And that developing warfighters is a two-part  
6 challenge. You have to develop a space warfighting ethos in  
7 our space operators, and you have to develop what you and I  
8 might consider more well established joint warfighters that  
9 also have an understanding of space. And so those four  
10 areas is how this command would be designed to get after  
11 those, principally those four priorities up front.

12 Senator Jones: All right. Thank you, General.

13 Dr. Scolese, I take it that you are a believer that the  
14 NRO should stay separate from and independent from other  
15 space entities like Space Force. Would that be correct?

16 Dr. Scolese: Yes, sir. I follow what is in SPD-4 at  
17 this stage of the game and recognize that there is a 180-day  
18 study that is ongoing that is going to develop a better  
19 understanding of what that relationship needs to be.

20 Senator Jones: All right. From your perspective,  
21 obviously intelligence plays a unique role. But are there  
22 other reasons, as you sit here today, that you believe it is  
23 important why the NRO should maintain -- while having a  
24 great relationship, which is critical, but also an  
25 independent relationship from the Space Command?

1           Dr. Scolese: Certainly the role of the NRO is to  
2   develop and acquire systems for others to use the results  
3   from. And I believe that, if confirmed, one of the best  
4   ways to do that is to have several organizations that are  
5   developing capabilities and technologies so that we can  
6   achieve the best for the nation, but that requires close  
7   coordination to assure that there is not duplication and  
8   that we are taking advantage of each other's capabilities.  
9   So in addition to the multiple organizations that the NRO  
10   supports, I think the independence and the ability to  
11   coordinate with other organizations is also critical.

12           Senator Jones: Great. Thank you.

13           Thank you both for your service and congratulations.

14           Thank you, Mr. Chairman.

15           Chairman Inhofe: Thank you, Senator Jones.

16           Senator Tillis?

17           Senator Tillis: General Raymond, thank you for being  
18   here. Mr. Scolese, you as well. Thank you for your  
19   continuing service.

20           General Raymond, it was about a month and a half, maybe  
21   2 months ago that General Dunford did, I think, a good job  
22   of describing what we are trying to do, almost creating an  
23   analog within the Air Force, similar to what we have with  
24   the Marines and the Navy. Do you think that that is an  
25   interim step towards a completely separate force, or do you

1 think that that is the best direction to take this focus on  
2 the space domain?

3 General Raymond: On the topic of a Space Force, I am  
4 very comfortable -- and I appreciate very much the diligence  
5 that this committee has put on this topic. It is of extreme  
6 importance to our nation. I feel it is absolutely the right  
7 thing to do, to establish a Space Force. And I absolutely  
8 think it is the right thing to do to establish that  
9 underneath the Department of the Air Force. I think it  
10 helps reduce the bureaucracy that would be required if you  
11 went separate.

12 Senator Tillis: What about the sort of organizational  
13 rationalization that we need to do? It is not like we are  
14 not paying attention to space now. You mentioned in your  
15 opening comments that you feel like we are in a superior  
16 position, although I personally believe that the gap is  
17 narrowing. So it is not like we are not paying attention to  
18 that domain. It is just embedded in various other agencies  
19 and areas within DOD.

20 So as a part of standing that up, how much work do we  
21 have to do to rationalize tasks that may be completed  
22 elsewhere that need to be consolidated under that entity?

23 General Raymond: I think one of the things that  
24 General Dunford talked about when he was here on the 11th of  
25 April was that singularity of focus. I think that is really



1 important that you have a commander that comes to work every  
2 day focused on that domain. I think if you look at  
3 Goldwater-Nichols and the two functions, the function that I  
4 am here for today is U.S. Space Command, but on the Space  
5 Force side, that is the organize, train, and equip. And I  
6 think singularity of focus for both of those functions will  
7 be important.

8       Senator Tillis: Now, the command that you are taking  
9 control of -- you do not necessarily need to respond to this  
10 question, just more or less take it on as a part of your  
11 mission. You are running a large, complex operation that  
12 develops and acquires sophisticated tools for you to  
13 complete your job. While you are trying to figure out the  
14 best capabilities for us to maintain our position of  
15 superiority, I hope you will spend a lot of time on the  
16 plumbing, the acquisition processes, the prototyping  
17 processes, the timelines that we need to field these  
18 capabilities so that we drive cost out of the administrative  
19 processes so that we can put more of our money, which is  
20 never enough, into the capabilities that we need to keep our  
21 nation safe. So that is just really a charge for you to  
22 look at.

23       General Raymond: If confirmed, Senator, I will do  
24 that. To get to your point that you said you thought our  
25 operational advantage was eroding or shrinking, we have to

1 move fast, and that acquisition piece is a critical piece of  
2 it.

3 Senator Tillis: Thank you.

4 Mr. Scolese, do you have any family members here?

5 Dr. Scolese: I do. My wife is here with me.

6 Senator Tillis: I did not remember you introducing her  
7 during your opening comments. That is a major miss  
8 incidentally. So welcome, Ms. Scolese. Welcome to both of  
9 you and for your service.

10 In your new role, what are the things that you feel  
11 like going into it -- you have a lot of experience and  
12 insight. What do you think your key challenges and  
13 priorities are going to be when you get confirmed?

14 Dr. Scolese: If confirmed, I believe my key challenge  
15 is going to be to understand the operations aspect of the  
16 NRO. I have had experience working on the technical side,  
17 if you will, the development of satellite systems and  
18 concepts with the NRO and other organizations, including the  
19 Air Force and NOAA. So that is one.

20 And then, of course, building the strong relationships  
21 and continuing the strong relationships that have been  
22 established, getting to know all of the partners. And I am  
23 committed, if confirmed, to work it very closely with Space  
24 Command, the Space Force as it is set up, as well as all the  
25 other organizations that the NRO deals with, to improve and

1 maintain the levels of collaboration and partnerships that  
2 are needed to assure the safety of our country.

3 Senator Tillis: Well, thank you very much.

4 I look forward to supporting both of your nominations.  
5 And congratulations to your two gainfully employed  
6 daughters, General. By the way, when you all look for an  
7 advanced degree, Iowa has taken a few of our good people  
8 from NC State. You should consider that one. Thank you  
9 all.

10 Chairman Inhofe: Thank you, Senator Tillis.

11 Senator Kaine?

12 Senator Kaine: Thank you, Mr. Chair.

13 Thank you to the witnesses. Congratulations. Dr.  
14 Scolese, thank you for being with me last week as we were  
15 together at the NASA Wallops facility. That was a very  
16 impressive visit.

17 I want to ask a question about allies, and I want to  
18 ask a question about rules. And so the allies question, I  
19 am going to come to General Raymond. Dr. Scolese, I will  
20 come to you about rules.

21 So space is a domain just like land and sea are a  
22 domain, and we are engaged all the time in activities with  
23 allies in land, sea, and air domains. We are doing joint  
24 exercises and joint training. I got a kid in the Marines  
25 who has been deployed twice with the militaries of other

1 nations in exercises.

2 I am curious if we could talk a little bit about allies  
3 in space. China and Russia are competitors. China and  
4 Russia are doing more things together. They just did land  
5 exercises together on the Russia-China border. As  
6 adversaries, they are each formidable. They could be more  
7 formidable when they combine.

8 Talk a little bit about in the space domain what are we  
9 doing together with allies, General Raymond.

10 General Raymond: Thank you. It is a really, really  
11 critical question, Senator, and it is a focus area that we  
12 have been focused on for the last several years. We  
13 historically have not had those partnerships that we have  
14 needed in space.

15 I will tell you today we operate capabilities together  
16 in our command and control center. We actually renamed it  
17 or redefined it as a combined space operations center. So  
18 we have our Five Eyes partners, Canada, UK, Australia,  
19 located with us in our C2 center. We are also developing  
20 very close partnerships with France, Germany, and Japan. We  
21 exercise together. We train together. We war game  
22 together. We have taken our professional development  
23 courses that we used to develop our warfighters and we have  
24 expanded the allied participation in that. And so we have  
25 international sharing agreements, relationships where we

1 share space situational awareness data with countries around  
2 the globe. And so it is a big focus area.

3 I do not want to declare victory. I want to say that  
4 we have made some significant progress. But to do what this  
5 command is going to have to do, if confirmed, I will  
6 absolutely commit to this committee that we will continue to  
7 work this really hard.

8 Senator Kaine: Great. This is something that I think  
9 I might like to have a follow-up, in-depth discussion about.  
10 I am really interested in this point.

11 Now to Dr. Scolese. Rules. And this is maybe taking a  
12 little bit of an advantage of your NASA work as you come in  
13 to NRO.

14 Right now, the estimates are there are 4,000 satellites  
15 circling the earth. 1,800 are active. 2,200 are inactive.  
16 Some of the inactive ones are pretty large. There is a  
17 European satellite called an Envisat I think that is a very  
18 large one. The estimates are that every year their  
19 satellites come within 200 yards of it. It is supposed to  
20 be up for 150 years. The likelihood of a collision that  
21 could lead to a lot of space debris is pretty high. There  
22 are plans to put thousands of more satellites into space.

23 There are also collisions in space. A defunct Soviet-  
24 era satellite collided with a U.S. satellite. That is  
25 costly to us, but it also produces debris that endangers

1 other satellites. China used an anti-satellite weapon to  
2 knock down one of their defunct satellites to show that they  
3 could do it. That created debris. India, just in the last  
4 2 months, did the same thing.

5 I did not know this until recently. There is a  
6 publication, "Orbital Debris Quarterly," that NASA puts out.  
7 There is a NASA scientific concept called the Kessler  
8 Syndrome that talks about when you have so many satellites  
9 and so much debris, it could make orbiting essentially  
10 collapse because there would be just too much debris and the  
11 prospects of collisions would be high. This would affect  
12 what investments we should make. The likelihood of an  
13 investment being wasted because of collisions.

14 Is space just a wild frontier where everybody just gets  
15 to do whatever they want and then all of our investments are  
16 in jeopardy? Or what sort of rules domain should we be  
17 looking at so that we can have the capacities you want for  
18 intel gathering or others without running the risk of losing  
19 our assets or tremendous commercial losses on the commercial  
20 side?

21 Dr. Scolese: Certainly there are rules that are  
22 supposed to be followed by nations and organizations  
23 regarding the generation of space debris and operation  
24 within certain slots for RF and physical space separation.

25 At the same time, the U.S. Government, the Air Force

1 tracks a number of objects. NASA works very closely with  
2 them to assure that we avoid collisions with the Space  
3 Station and others of our assets. The same is true working  
4 with the civil sector to try and make sure that our civil  
5 satellites are protected.

6 Some of the rules require that satellites be disposed  
7 of. A number of the NASA satellites now in low earth orbit  
8 have fuel to de-orbit at the end of their useful life and in  
9 higher orbits, to go to a storage orbit so that they are out  
10 of the way of other satellites.

11 The same things are supposed to apply internationally.  
12 I know not everybody follows those rules, but that is  
13 something that through international engagements, working  
14 with our allies, as you asked earlier, can provide us with  
15 ways to better enhance the security and the safety of our  
16 space environment.

17 Senator Kaine: I will just conclude by saying the two  
18 concepts sort of link up allies and rules because there are  
19 even scenarios, kind of war-gaming scenarios, where you  
20 create debris by knocking out active satellites, and you do  
21 that in a way that will then disable other nations'  
22 equipment. And so I think the concept of what rules and  
23 what is the enforcement of the rules is going to be  
24 something we are going to have to get into if we are going  
25 to guard the value of the investments we are making and the

1 integrity of your intel operations.

2 So thank you very much, and I look forward to  
3 supporting you both.

4 Thanks, Mr. Chair.

5 Chairman Inhofe: Thank you, Senator Kaine.

6 Senator Cramer: Thank you, Mr. Chairman.

7 I thank both of you for being here.

8 General Raymond, I just want to visit a little bit  
9 about the distinctions between Space Command and Space  
10 Force. I know you had a question earlier about it. I want  
11 to drill down specifically on the chain of command as we  
12 laid it out in the markup for the NDAA.

13 As you may know, I worked with the chairman and members  
14 of the committee on three specific provisions as it relates  
15 to the command of Space Force. What I tried to lay out is  
16 an incremental approach that allows for the Space Force to  
17 be established but dissuades another big bureaucracy at  
18 least over time while we work through this. Hopefully, it  
19 sets it up for success. That was my goal and I think the  
20 committee's goal.

21 As you understand, in the NDAA mark, should that  
22 eventually become law as is -- and we all know that it has  
23 got a ways to go, but should it, there will be a dual hat  
24 commander of Space Force and Space Command for a year.  
25 After that year, then of course each would have their own



1 commander. I do not know at that point if you draw straws  
2 or how that will all work, but that is what we are going to  
3 work through. And then, of course, the answering up the  
4 chain of command changes as well.

5 My question for you or maybe just my request for you  
6 today would be, could you explain -- and of course, the  
7 Department did weigh in and supported these changes,  
8 particularly the dual hat, the direct supervision of the  
9 Secretary, and those things, the seat on the Joint Chiefs.  
10 But could you describe the differences, as you see them, why  
11 you supported it, why the Department supported that, and why  
12 it is important that this approach that we are taking is  
13 important?

14 General Raymond: So, Senator, thanks for the question.

15 Goldwater-Nichols is very clear that there are two  
16 functions when they reorganized the Department to great  
17 effect. One function is an organize, train, and equip, and  
18 the other is a warfighting function. So today the President  
19 has nominated me for Air Force Space Command, which is an  
20 organize, train, and equip hat, and a U.S. Space Command  
21 Commander, which is in the joint warfighting hat. I am  
22 dual-hatted in that role. So, if confirmed, I would have  
23 both a warfighting hat and an organize, train, and equip  
24 hat.

25 Today in my current job, in Air Force Space Command, I

1 have that same dual hat. I am Air Force Space Command  
2 Commander, an organize, train, and equip, and in my joint  
3 hat, the Joint Forces Space Component Command, I have a  
4 joint role through U.S. Strategic Command. In that case, I  
5 have two separate staffs today. I have an Air Force staff  
6 that does organize, train, and equip, and I have a joint  
7 forces staff that does the warfighting and operations for  
8 space through U.S. Strategic Command. And so those hats  
9 come together, two separate staffs, one commander. It is a  
10 role that I am in today. And if confirmed by this  
11 committee, it would be a role that I would have in the  
12 future with a commander of Air Force Space Command and the  
13 commander of U.S. Space Command.

14 Senator Cramer: So as it pertains to Space Force then  
15 a year from now -- again, assuming as it is in the current  
16 mark --

17 General Raymond: So let me first in all sincerity  
18 thank this committee for all the work that you have done on  
19 this. You have put a lot of time and effort into getting  
20 this right. I fully am supportive of a Space Force. I  
21 think we need to elevate the organize, train, and equip to a  
22 force level.

23 I have not seen the bill. I have seen the summary of  
24 the bill, the press summary of the bill. I will tell you,  
25 if confirmed, I look forward to working very closely with

1 this committee and with my leadership to make sure that we  
2 get this right for our nation.

3 Senator Cramer: It would be hard to ask for more than  
4 that.

5 And with that, I would just yield back and thank both  
6 of you for your willingness to serve.

7 Chairman Inhofe: We are going to call this meeting to  
8 a close, but we may want some comments. Well, we thank you  
9 both for the time you spent. You are both going to be doing  
10 a great job and we are looking forward to working with you.

11 [Whereupon, at 11:00 a.m., the hearing was adjourned.]

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