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Before the

COMMITTEE ON
ARMED SERVICES

UNITED STATES SENATE

NOMINATIONS

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ALDERSON COURT REPORTING
1155 CONNECTICUT AVENUE, N.W.
SUITE 200
WASHINGTON, D.C. 20036
(202) 289-2260
www.aldersonreporting.com

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U.S. Senate

Committee on Armed Services

Washington, D.C.

The committee met, pursuant to notice, at 9:32 a.m. in Room SD-G50, Dirksen Senate Office Building, Hon. James Inhofe presiding.

Present: Senators Inhofe [presiding], Wicker, Fischer, Cotton, Rounds, Ernst, Tillis, Sullivan, Sasse, Scott, Reed, Shaheen, Gillibrand, Blumenthal, Donnelly, Hirono, Kaine, King, Heinrich, Warren, and Peters.

OPENING STATEMENT OF HON. JAMES INHOFE, U.S. SENATOR FROM OKLAHOMA

Senator Inhofe: The meeting will come to order.

The Senate Armed Services Committee meets today to consider the nominations of Dr. Michael Griffin to be Under Secretary of Defense for Research and Engineering; Phyllis Bayer to be Assistant Secretary of the Navy for Installations, Energy, and the Environment; John Henderson to be Assistant Secretary of the Air Force for Installations, Environment, and Energy; and Dr. William Roper to be Assistant Secretary of the Air Force for Acquisition.

Thank you for joining us this morning. We appreciate your being here, and we are looking forward to asking you questions.

We do have our seven required questions that I would ask each one of you, if you would audibly respond to each one of them as we go down.

First of all, have you adhered to the applicable laws and regulations governing conflict of interest?

Dr. Griffin: Yes.

Mrs. Bayer: Yes.

Mr. Henderson: Yes.

Dr. Roper: Yes.

Senator Inhofe: Will you ensure that your staff

complies with the deadlines established for the requested communications, including questions for the record and hearings?

Dr. Griffin: Yes.

Mrs. Bayer: I will.

Mr. Henderson: Yes.

Dr. Roper: Yes.

Senator Inhofe: Will you cooperate in providing witnesses and briefers in response to congressional requests?

Dr. Griffin: Yes.

Mrs. Bayer: Yes.

Mr. Henderson: Yes.

Dr. Roper: Yes.

Senator Inhofe: Will those witnesses be protected from reprisal from the testimony or briefings?

Dr. Griffin: Yes.

Mrs. Bayer: Yes.

Mr. Henderson: Yes.

Dr. Roper: Yes.

Senator Inhofe: Do you agree, if confirmed, that you will appear and testify upon request before this committee?

Dr. Griffin: Yes.

Mrs. Bayer: Yes.

Mr. Henderson: Yes.

Dr. Roper: Yes.

Senator Inhofe: And do you agree to provide documents, including copies of electronic forms of communication, in a timely manner when requested by a duly constituted committee or to consult with the committee regarding the basis for any good-faith delay or denial in providing such documents?

Dr. Griffin: Yes.

Mrs. Bayer: Yes.

Mr. Henderson: Yes.

Dr. Roper: Yes.

Senator Inhofe: And the last question, have you assumed any duties or undertaken any actions which would appear to presume the outcome of the confirmation process?

Dr. Griffin: No.

Mrs. Bayer: No.

Mr. Henderson: No.

Dr. Roper: No.

Senator Inhofe: Okay.

Dr. Griffin and Dr. Roper, you have been nominated in important positions with the department's acquisition enterprise at a critical moment for our military. In today's increasingly dangerous and complicated world, America's qualitative and quantitative advantage is eroding.

That actually came from General Dunford. It is kind of a scary thought that our qualitative and quantitative edge

that we have had historically is eroding.

A lot of that is due to our acquisition processes that have been broken for a long time. And that will be my first question of the two of you, is how you are going to come along and, finally, we are going to break this thing and make some good things happen.

Mrs. Bayer and Mr. Henderson, you have been nominated to oversee the issues of the energy policy, environmental obligations, and military construction for the Navy and Air Force, respectively. If confirmed, you will be responsible for addressing and pressing the issue of aging infrastructure within each of those services. Decades of underinvestment in the Department of Defense installations has led to substantial backlogs of facility maintenance activities, created substandard living and working conditions, and made it difficult to take advantage of new technologies that could increase productivity.

This is something that we are going to have to do. We thank you for your willingness to serve. I look forward to your testimony.

Senator Reed?

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

Senator Reed: Thank you very much, Mr. Chairman.

And let me welcome the nominees, thank them for their willingness to serve, and also thank their family members, many of them here today, who lend their support in your efforts.

Dr. Griffin, you are nominated to serve a newly constituted position of Under Secretary of Research and Engineering, and as such, you will be charged with ensuring that our operational forces have access to the best and latest technologies and systems. You will have to ensure that the department is leading the way in areas of technology and engineering that the U.S. military needs to prioritize, like undersea warfare and hypersonics. You will also have to work to make sure that DOD can keep up with the rapid pace of global and commercial technological innovation in fields like biotechnology and artificial intelligence.

A large part of your role will be your ability to create an environment where innovators inside the department at places like DARPA and the labs, and outside the department in industry and universities, have the funding and protection from red tape and bureaucracy they need so that they can thrive.

If confirmed, you will be the first person to hold the

Under Secretary for Research and Engineering title since the reorganization legislation was passed. You will be sorting out the details of who handles the variety of acquisition functions occurring in the Pentagon right now and identifying your responsibilities and authorities.

From my perspective, you have a wealth of background on space, but let me be clear that the day-to-day job for which you are being confirmed is to be the chief technology and innovation officer of the department and not for the management of space issues.

I look forward to hearing your views on the new position and your strategy for keeping the department in a position of technological superiority.

Mrs. Bayer, you are nominated to serve as the Assistant Secretary of the Navy for Installations, Energy, and the Environment. And Mr. Henderson has been nominated to be the Assistant Secretary of the Air Force for Installations, Energy, and Environment. If confirmed, both of you will have a unique opportunity to restore readiness by improving the energy resilience of the Navy, Marine Corps, and Air Force.

The Department of Defense relies on a network of infrastructure that requires uninterrupted access to electricity, and we face increasing vulnerabilities if we do not change the way we power our mission. Energy resiliency

improvements can often be achieved through third-party financed projects at no cost to the taxpayer.

The committee has repeatedly given the department new mechanisms to improve energy security through the NDAA, and I urge you both to explore them and put them to good use.

I strongly urge you both, if confirmed, to advance operational energy improvements, as well. Specifically, I suggest you thoroughly examine where in the logistical supply of energy our troops are most vulnerable in both contested environments and here at home.

I strongly urge you both to identify energy-related seams and gaps that may exist between the combatant commands and campaign plans. Simply put, the more efficient use of energy and alternative energy technologies can extend the combat reach of units, allowing them greater lethality.

Climate change is a direct threat to military readiness. It has already cost the department hundreds of millions of dollars, and, if left unchecked, it will continue to mirror significant cost overruns observed in other programs of record. Simply put, the department must plan for and mitigate the effects of climate change.

The fiscal year 2018 NDAA requires DOD to deliver to Congress a list of the 10 most vulnerable military installations within each service, based on the effects of rising sea tides, increased flooding, drought,

desertification, wildfires, thawing permafrost, and others.

Mrs. Bayer and Mr. Henderson, I hope that you will prioritize that legislative direction, if you are confirmed.

Dr. Roper, many challenges will face the Air Force senior acquisition executive. Although perhaps not at the same operation tempo as the Army and Marine Corps, but at a significant tempo, the Air Force has been facing a difficult challenge in balancing its modernization needs against the cost of supporting ongoing operations overseas. If you are confirmed, you will play a significant role in choosing among these priorities.

In addition, you will be largely responsible within the Air Force for implementing the major changes in the acquisitions system that the Congress has enacted over the past several years. Some of these changes relate to expanding rapid acquisition processes to a broader segment of the department's acquisition portfolio.

Your recent experience as director of the Strategic Capabilities Office should serve you well in this regard. However, you will also need to deal with some very large, very complicated programs where rapid acquisition practices may have some benefit but will not be able to supplant all the normal acquisition processes.

I look forward to working with you on how we can both do better to refine our acquisitions system and modernize

our Air Force.

Again, let me thank the nominees for your willingness to be here today and to serve the country, and the committee looks forward to hearing your views on these issues.

Thank you.

Senator Inhofe: Thank you, Senator Reed.

We will start with 5-minute opening statements. Your entire statement will be made a part of the record, but try to confine your opening statement to 5 minutes, starting with Dr. Griffin.

STATEMENT OF HON. MICHAEL D. GRIFFIN, PH.D., TO BE UNDER SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING

Dr. Griffin: Mr. Chairman, Senator Reed, members of the committee, thank you for the opportunity and the privilege to appear before you today. I am honored to appear as the nominee for the position of Under Secretary of Defense for Research and Engineering. And I would like to thank President Trump and Secretary Mattis for their confidence in me and this committee for your consideration of that nomination.

The superiority of U.S. military power and, therefore, our ability to deter our adversaries and protect our interests is critically dependent upon our ability to build and maintain a significant technical edge in key domains that enable U.S. power projection and, with that, the effective defense of U.S. interests, allies, and assets.

Global proliferation of technology and the vulnerabilities of an open society to asymmetric threats demand that we reassert our technological leadership. Our adversaries are leveraging nearly universal access to technology and exploiting our own scientific and technological advances to threaten our deployed forces, our allies and the national and economic security of our Nation.

We possess the finest technical development capabilities in the world in our National Labs, the defense

and commercial industrial base, and our academic institutions.

The Defense Department represents over 50 percent of U.S. Government expenditures in RDT&E and is the world's largest employer of scientific and engineering talent. We can and must provide the leadership to focus these critical national resources to foster strategic advances in technology and, above all else, the rapid incorporation of those technologies into new military capabilities.

The defense of the Nation requires new and aggressive investment in and accelerated development of autonomous systems, artificial intelligence and machine learning, space protection and defense, electronic warfare, hypersonics, advanced computing, strategic weapons, and nuclear command and control. These same capabilities are also desired by our adversaries, who seek to exploit our own research and engineering achievements to threaten our interests.

Restoring our supremacy in these and other critical areas requires focused leadership and cooperative effort on the part of key stakeholders across the government, across industry, academia, and among our allies.

I want to thank this committee for its ongoing acquisition reform efforts and for refocusing the department on regaining our technical edge. The United States established and maintained its dominance in the 20th century

through technical advances including GPS, ARPANET, stealth technology, precision-guided munitions, things that were developed under the leadership of the then-directors of Defense Research and Engineering. The establishment of the new USDR&E position offers the opportunity to marshal our resources for critical modernization efforts and restoration of our technological edge.

If confirmed as the USDR&E, I intend to ensure that we are fully leveraging the intellectual, economic, and innovative capabilities of our people and the Nation to deliver the world's most advanced systems to support our warfighters, and to do it with the speed and responsiveness that once astonished the world.

If confirmed, I will work with the members of this committee to sustain and expand U.S. technological superiority in defense of our Nation.

Mr. Chairman, members of this committee, I thank you for your time and attention, and I look forward to answering your questions.

[The prepared statement of Dr. Griffin follows:]

Senator Inhofe: Thank you, Dr. Griffin.

Mrs. Bayer?

STATEMENT OF PHYLLIS L. BAYER, TO BE ASSISTANT SECRETARY OF THE NAVY FOR INSTALLATIONS, ENERGY, AND THE ENVIRONMENT

Mrs. Bayer: Good morning, Senator Inhofe, Senator Reed, and distinguished members of this committee. It is a privilege to appear before you today as the nominee for the Assistant Secretary of the Navy for Energy, Installations, and the Environment.

I am deeply honored to be nominated by the President of the United States, and I am especially grateful to Secretary Jim Mattis and Secretary Richard Spencer for their support and confidence in me to become a part of their team.

Finally, I would like to recognize my husband, Michael, who is with me here today. Michael is my superhero, and without him and his loving care, I could not be here today.

My career began as a civil servant in 1986 when my college adviser, Dr. David Patrick, encouraged me to join the U.S. Army Corps of Engineers at the Waterways Experiment Station in Vicksburg, Mississippi, where I worked as a field geologist. Opportunities soon took me from the field to the Pentagon, where I have worked on many policy areas in the Office of the Secretary of Defense, including environmental compliance, installations management, and, recently, personnel and readiness.

If confirmed, it would be my greatest honor to work and

serve in the Department of the Navy. And I commit to you that I will focus my full attention on enhancing the combat capabilities of sailors and marines by providing them reliable and secure infrastructure and safe working conditions, and being a good steward of the environment.

As I reflect over my various jobs, I believe they have collectively prepared me to perform the duties for which I appear before you today.

For example, I spent several years working in the environmental cleanup programs and spent many hours in dialogue with our partners in the Federal and State communities to help develop cleanup goals that were protective of human health and the environment. But they were also in support of economic redevelopment.

While working on policies for the department's premier test and training ranges, I learned firsthand that fiscal discipline is necessary to sustain these large capital assets, without which, those assets, our servicemembers could not properly test weapons or be trained to perform their duties.

While at the Defense Business Board, I learned how the department, a huge public entity, can become more efficient by adopting private-sector best practices. And at the National War College, I learned how relationships, particularly with the interagency, make us stronger. While

working to redefine the major DOD headquarters activities, I saw how we must make tough choices, like reducing overhead, to find savings for higher priority needs.

I am keenly aware of today's national security challenges and the seriousness of the department's eroding readiness. And I have experienced the senseless expense from budget uncertainty and unpredictable continuing resolutions.

If confirmed, I will harness these lessons learned and hold myself and my team accountable to implement the priorities of Secretary Mattis and Secretary Spencer, namely, to strengthen the Navy and the Marines' readiness, modernize processes to find efficiencies for readiness, and use partnerships to leverage every dollar entrusted to the Department of the Navy.

In closing, I want to tell you that my parents, Thomas and Loretta Breland, who are watching via the internet today from Picayune, Mississippi, they ingrained in me the value of hard work and the value of every dollar.

If confirmed, I commit to you that I will work hard and with a sense of urgency and, as Secretary Spencer committed to you, to even perspire if necessary, to stretch every dollar to enable the Nation's sailors and marines to better perform their duties and become a more ready and lethal force.

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

[The prepared statement of Mrs. Bayer follows:]

Senator Inhofe: Thank you, Mrs. Bayer, and we welcome our group from Picayune to this committee.

We now recognize Senator Rounds for an introduction of Mr. Henderson.

STATEMENT OF HON. MIKE ROUNDS, U.S. SENATOR FROM SOUTH DAKOTA

Senator Rounds: Thank you, Mr. Chairman.

Mr. Chairman, Ranking Member Reed, it is my honor and privilege to introduce Mr. John Henderson, a South Dakota native and an excellent choice to be the next Assistant Secretary of the Air Force for Installations, Environment, and Energy.

John is joined by his wife, Amy; his son, Luke; and his daughter, Grace. I would like to take this moment to welcome them all to Washington, D.C.

John and his family have been a part of the Army family for more than 22 years. During that time, John deployed on multiple combat tours to Iraq and Afghanistan, 3 years forward-deployed in the Republic of Korea, repeated assignments in the PACOM area of responsibility, and in multiple positions safeguarding our Nation's infrastructure with the Army Corps of Engineers.

I have known John since he took command of the Corps of Engineers' Omaha District in 2015, and I have known his wife, Amy, even longer. In the mid-1990s, Amy served as as Governor Bill Janklow's executive assistant when I was, at that time, the State Senate majority leader. It brings me immense personal pleasure and pride to welcome them here.

John earned his bachelor's degree at the South Dakota

School of Mines and Technology. Upon graduating, two of his first jobs were in South Dakota, as an engineering technician for the South Dakota Department of Transportation in Custer and as a project manager in Sioux Falls.

John possesses the personal qualities, technical expertise, and experience that we need in our senior Defense leaders. He has impeccable technical skills and credentials as a professional engineer. But equally important is his understanding of people, sacrifice, community, and what it takes to deploy and win from both the perspective of the team that goes into harm's way and from that of the institutional team that supports them.

He is a leader of great character, competence, and courage. John commanded a battalion in combat and deployed for two other critical combat tours in Iraq and Afghanistan. He led complex construction projects and programs in the Mississippi River, throughout the Pacific, and under very difficult conditions in Iraq.

During his last assignment as commander of the Corps' Omaha District, he was responsible for more than $1.5 billion in civil works, Army and Air Force construction, disaster response, and other programs in South Dakota and eight other States in the upper Midwest.

I would like to point out that throughout his time in command, John has worked very closely with my office to keep

me informed of important issues affecting the citizens of South Dakota and the upper Midwest. I know that he did the same for other congressional delegations. I am confident he will do the same in the future.

As Assistant Secretary of the Air Force for Installations, Environment, and Energy, John will be responsible for developing and executing plans, policies, programs, and budgets critical to the readiness of the Air Force, the well-being of our airmen, and stewardship of our Nation's resources.

I am confident that John Henderson's character, competence, and experience make him the right person to address the threats and challenges that we will face in the future.

Thank you, Mr. Chairman.

Senator Inhofe: Thank you.

Mr. Henderson, I think you have his vote. You are recognized.

[Laughter.]

STATEMENT OF JOHN W. HENDERSON, TO BE ASSISTANT SECRETARY OF THE AIR FORCE FOR INSTALLATIONS, ENVIRONMENT, AND ENERGY

Mr. Henderson: Thank you, Senator Inhofe, Ranking Member Reed, and distinguished members of this committee. My family and I are grateful for the privilege to appear before you today and seek confirmation as Assistant Secretary of the Air Force for Installations, Environment, and Energy.

Thank you, Senator Rounds, for the kind introduction this morning. We really appreciate that.

I would like to also say thanks to the President for this nomination, and to Secretary Wilson and Secretary Mattis for their gracious support throughout this process.

I am very blessed to have my family here again with me today, just as they always have been with me throughout my military career. My wife, Amy, and our children, Luke and Grace, have not only been strong supporters of me and my military service but have also served as combat multipliers, thanks to their many thousands of dedicated volunteer hours in support of our military families.

Today, I respectfully ask for your support for my confirmation as the Assistant Secretary of the Air Force and the opportunity to continue serving our great Nation by serving those who protect it and all for which it stands.

If confirmed, I will focus on assisting Secretary Wilson and General Goldfein in executing the priorities of the Air Force and the Department of Defense, and commit to working with the members of this committee in a productive and transparent manner.

Through the lens of installations, environment, and energy, this means we need to ensure readiness by providing the required infrastructure to project power around the world; deliver durable, resilient facilities in support of operations, training, and research; and provide a safe and healthy environment for our airmen, their families, and our community partners.

We also need to cost-effectively modernize the force and drive innovation by incorporating advanced technologies and enhanced management practices to optimize energy requirements and mitigate impacts to our environment.

And perhaps most importantly, we need to continue to develop the next generation of exceptional leaders to ensure the enduring strength of the Air Force and the enduring strength of our Nation.

Our partnerships will continue to be critical to the success of our installations, as well as our energy and environmental portfolios. As Secretary Wilson has often said, we are stronger when we are together.

If confirmed, I will endeavor to build strong

partnerships with the members of this committee, other Members of Congress, our Department of Defense and sister service teammates, the communities who host our installations, our allies, and our private-sector partners who support our mission.

As we know well in the military, service to our Nation has always been a team sport, and the strength of our team directly contributes to the strength of our Nation. Further, the foundation of any strong team is people who are worthy of trust, who treat all teammates with dignity and respect, and who expect the same from all with whom we serve.

If confirmed, you have my commitment to the priorities of the department and of the Nation, and to do my part to build strong teams through a values-driven, mission-focused and people-oriented culture.

Thank you again for this opportunity, and I look forward to addressing your questions.

[The prepared statement of Mr. Henderson follows:]

Senator Inhofe: Thank you, Mr. Henderson.

Dr. Roper?

STATEMENT OF WILLIAM B. ROPER, PH.D., TO BE ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION

Dr. Roper: Senator Inhofe, Ranking Member Reed, and distinguished members of the committee, it is an honor to appear before you today with these distinguished witnesses as the President's nominee to be the Assistant Secretary of the Air Force for Acquisition, Technology, and Logistics.

I would like to thank the President, Secretary Mattis and Secretary Wilson for their trust and confidence, and, if confirmed, the tremendous opportunity to build, field, and maintain the world's premier Air Force.

I would also like to thank the committee for considering my nomination. I know each one of you cares about maintaining our military's advantages in air, space, and cyberspace, so I look forward to answering your questions today.

Before making any formal remarks, I would like to thank my wife, Marti, for her love and support of my career. Her own government service in the Army and the Department of Homeland Security were influential in my decision to work in national security. I am continually thankful to have a partner who understands how important and challenging maintaining our national security truly is. It is great to have her with me today.

I would also like to thank my mother and father,

brother, mentors, and my current team of amazing innovators. I would not be here without your investment of time in me.

I know this committee is well-aware of the problems facing our military today. Capabilities developed decades ago were studied, copied, and, in many cases, exploited by our adversaries. The industrial base contracted as longstanding defense companies merged, and new startups often remained unconnected to our military.

New commercial technologies likely to revolutionize warfare, particularly artificial intelligence, machine learning, and autonomy, accelerated significantly. And technologies our government must develop, like hypersonics and directed energy, slowed compared to other nations, like China.

It is no wonder fundamental changes to how we design, acquire, and sustain our military are a continual focus of this committee, and I applaud your recent efforts to reform it.

For over 5.5 years, I have briefed Congress on my work in the Strategic Capabilities Office, or SCO, and its innovation process intended to help turn this tide. We have worked with our service partners to reimagine, upgrade, and incorporate commercial technologies into their systems using a rapid innovation process they have come to trust.

I am truly honored the Air Force is willing to take

that trust to the next level, should you confirm me. SCO's secret is fairly simple: empowering program managers with design tradespace, prototyping, flexible contracting, and appropriate decision authorities to take the reins of their programs. Resulting organizational byproducts -- speed, agility, accountability -- deliver alongside much-needed advanced systems, like swarming drones, high-speed strike, hypervelocity guns, machine learning-enabled sensing, and arsenal planes.

This tells me that modern defense systems are too complicated, evolving, and important to be stewarded by burdensome, cumbersome, paper-driven processes. It is time to increase human-driven innovation and acquisition, the kind that birthed the SR-71, GPS, F-117, and so many other amazing systems that are the true roots of the Air Force.

If confirmed as the Air Force's senior acquisition executive, you can expect me to continue implementing congressional intent by expanding this human-driven approach, delegating decisions to the lowest appropriate level; increasing rapid experimentation and prototyping for fast failing, early risk reduction, and keeping flawed concepts out of programs of record; and expanding the use of commercial technology and practices, including designing for upgradeability and sustainment.

The net result must be managing the cost of readiness

and modernization of today's Air Force to sustain critical investments in the game-changing technologies that future airmen will need. You have my commitment that I will work closely with the Air Force, other services, the Office of the Secretary of Defense, and congressional leaders to achieve it.

Thank you again for the opportunity to appear before you today. It is truly an honor to be considered for this position.

[The prepared statement of Dr. Roper follows:]

Senator Inhofe: Thank you, Dr. Roper.

Let's start with addressing this more toward Griffin and Roper.

The recent NDAAs, particularly in 2016, 2017, and 2018, have sought to address the problem of the slow, ineffective acquisition programs. Now, this is something we have been concerned about and this committee has explored. Every time we pass another NDAA, we have set up a system to try to correct the failures that we have had in the past in acquisition. Some of the prominent acquisition failures that we have talked about, we have to keep in mind, they were real.

And I am particularly concerned about it, because three of these directly affected the Army in my State of Oklahoma. We had the Future Combat System. We all remember that. That was going to resolve all of our problems. We got $20 billion into that, and then junked the system. The Comanche helicopter, a similar thing happened. That was $7.9 billion. The Crusader, we remember that well. That was $2.2 billion.

Now, this is money that was spent for which we got nothing out of. It was a total waste, as I see it. The Expeditionary Fighting Vehicle, $3.2 billion. The Expeditionary Combat Support System, $1 billion, that is the Air Force computer system.

And all of those we just mentioned add up to $67 billion, or roughly equal to the amount of money authorized in the fiscal year NDAA for OCO.

Now, we are looking at this right now. Most of the people on this panel believe that we need to do something. A CR punishes our military. It is just a continuation of the failures that we have had in the past.

So my feeling has been that we need to make some adjustments, so when all these decisions are going to be made, I guess some of them today and tomorrow, we have to keep in mind the problems that we have in our military.

So let me just say, Dr. Griffin and Dr. Roper, with the recent changes in the acquisition process and new organization set to take effect on February 1st, how are the two of you going to learn from past mistakes and ensure that we do not repeat them, while providing our servicemembers with the best military available?

And again, it is not just the last 3 fiscal years that we are talking about. Many years ago, I was on the House Armed Services Committee. We were trying to get acquisition reform at that time. So I would like to get your response to that and your ideas now.

Dr. Griffin: If you would like me to proceed first, sir?

Senator Inhofe: Yes.

Dr. Griffin: Thank you, Senator Inhofe.

I am not the first, I am not even the first here in this hearing today, to comment on the unseemly role of process, procedure, excessive bureaucracy in decision-making on acquisitions of new systems in the Pentagon or by the Pentagon, so I agree with your remarks.

I think the remedy starts with renewing our national commitment to developing systems through experiments, prototypes, operational prototypes, before we commit to major weapons system acquisitions.

In his opening remarks, Dr. Roper mentioned the SR-71, the most magnificent airplane ever built to date. It was fielded some 50 years ago. Few people remember that the SR-71 before it went into production was preceded by the YF-12A, which was a prototype airplane designed to wring out the problems of Mach 3 flight before we had to commit to an actual acquisition. Few people remember that the F-117 stealth fighter, the capability that we deployed during the first Gulf War, was preceded by a prototype development of the first six operational prototype airplanes and that that was done in 32 months.

So restoring that style of program development I think is the key.

Senator Inhofe: Dr. Roper, why don't you follow up on that, just briefly?

Dr. Roper: Yes, Senator. I completely agree with Dr. Griffin's points. I will just add a couple of my own.

I think the rigidity and the complexity of the requirements process stacks the deck against us up front. I know many of you have seen the hundreds of pages of requirements that are often part of programs that are very complex. When a system is specified that rigidly up front, there is not a lot of tradespace for program managers to explore, to prototype concepts, and avoid getting requirements that, really, the technology base is not able to achieve.

When that happens, you have to have those technologies mature for the program to proceed. So you get too many miracles that have to occur. So being able to pull the risk early, and being able to prototype and experiment to retire them, would be a huge benefit.

I also believe that designing for sustainability and upgradeability is not something that the department as a whole does well. We design for performance but not for things to evolve into the future.

To help us in that matter, we should look at commercial technology and practices to guide our thoughts. We are not extremely good at incorporating commercial technology because our rigid requirements process often says it is not good enough in one facet or another.

Senator Inhofe: Those are good points. My time has expired, but I do want to sit down with the two of you sometime in the next few days to talk about some of the specifics, because that is a problem, sooner or later, we are going to have to resolve. I appreciate it.

Senator Fischer?

Excuse me, Senator Reed. Sorry about that.

Senator Reed: I tend to blend into the background.

[Laughter.]

Dr. Griffin and panel, first, Dr. Griffin, you are one of the most qualified individuals to come up to this job in a very long time, so we look forward to that.

You have some practical issues right before you, which is we have just divided the responsibilities from AT&L between you and Secretary Lord. Do you have a sort of sense of some of the issues, in terms of what you are going to take and what she is going to take, not just a legislative definition, but practical?

Dr. Griffin: Well, sir, I have had a few chances to meet briefly with Ms. Lord, but until and unless I am confirmed, it is inappropriate for me, or has been inappropriate for me, to have any detailed organizational discussions. I just pledged that I have not, and I have not, indulged in any activities which would indicate confirmation.

Senator Reed: But you are fully prepared to sit down and have those discussions? Because on a host of issues, both practical and statutory, you will have to work out rules of engagement, for want of a better term.

Dr. Griffin: I am, sir. And, Senator Reed, I view as a good starting point the draft document that was furnished to the committee on August 1st, showing the tentative split between AT&L into acquisition and sustainment, and research and engineering.

I am on record with my APQs as endorsing that as a great starting point, and I would be prepared to work with this committee to discuss any changes we might wish to make in the department, if you should confirm me.

Senator Reed: Thank you.

And, Dr. Roper, and then I will come back to our nominees for the Navy and the Air Force, but you have to make a rough choice between rapid acquisition programs and traditional acquisition programs. Again, top line, any sense of how you will make those judgments, any priorities you will have for rapid versus traditional acquisition?

Dr. Roper: Senator Reed, it is going to have to be a balance between the two. As much as doing the rapid acquisitions is fun and invigorating for the staff, there are some programs that just require traditional approaches to stay on track.

One thing I have experienced in my current job in SCO is that you can innovate with anything. So what I would like to encourage, both in rapid programs and traditional ones, if confirmed, is that it is always a good time for innovative problem-solving, whether you are working on technologies or on production lines or on sustainment. And I feel like, over the past few decades, innovation and invention have become synonymous, and it has been relegated to laboratories. We need to get it back out into the program offices and into the field.

Senator Reed: Thank you.

Mrs. Bayer and Mr. Henderson, I mentioned the issue of energy resilience. Can you comment upon the ideas you have at this point with respect to increasing the energy resilience of both the Navy and the Air Force not only in installations but also, to the extent you have responsibilities, operational energy issues?

Mrs. Bayer first, then Mr. Henderson.

Mrs. Bayer: Thank you, Senator. Yes, the steps that the Navy has been taking to date have been very, very promising. As I look at the cost of the aging infrastructure, as you alluded to in your remarks, there are some big-dollar bills there. It is time for us to get more, I think, practical about using the space that is available to installations to create some sort of revenue-generating

source, particularly in the times of constrained budgets.

One of the most exciting things that I have heard about is what we are doing, actually, at Newport, Rhode Island, where the Navy took some brownfields that are 169 acres of unused space and working in third-party financing to install some photovoltaics, all free to the Navy. And also, the company that came in with the financing built a combined heat and power plant that the Navy did not have to pay for. That arrangement is allowing the Department of the Navy to have a backup source of power in the event of a power outage, which builds the resiliency and the ability of that base to conduct operations.

That is one example that, if confirmed, I look forward to doing more like that across the department.

Senator Reed: That is probably the best example you could give.

[Laughter.]

Mrs. Bayer: Thank you, Senator.

Senator Reed: Mr. Henderson?

Mr. Henderson: That is hard to follow up.

[Laughter.]

Senator Reed: Yes. We only have a National Guard squadron in Rhode Island, Air Force.

Mr. Henderson: From an Air Force perspective, Senator, and from the things that I have reviewed so far in

preparation for this hearing, and then, of course, some of the perspective I have seen from the Corps of Engineers, the Air Force, first of all, has leaned forward on this and has a good program for incorporating energy resiliency into their designs and leveraging third-party financing scenarios where it is beneficial.

If confirmed, I would continue to look at third-party financing as a way to, obviously, save money for us and provide alternate sources of energy.

Primarily, specifically, I would go after leveraging some of the direct funding authorities that are provided in the law with these energy programs, specifically for microgrids.

In order to have a third-party financed project, the business case has to be solid. I have experienced that in the Corps of Engineers also. Sometimes microgrids do not always lend themselves to that type of an arrangement, so the direct funding authorities would be very good there, and then leverage the third-party financing initiatives for all the other energy resiliency initiatives, distribution systems, for example.

And then, finally, I think it is important that we are thinking now, not just with energy resiliency, but, obviously, with weather impacts, cyber impacts, other vulnerabilities to our facilities, that we are incorporating

new technologies and new design criteria into our facilities and infrastructure now to ensure that they are designed to be energy resilient, and it isn't something we have to add on later.

Senator Reed: Thank you very much.

Thank you, Mr. Chairman.

Senator Inhofe: Thank you.

Senator Fischer?

Senator Fischer: Thank you, Mr. Chairman.

Mr. Henderson, welcome. During your time at the Omaha District, I know that you put a particular focus on placing projects back on schedule, including those that faced delays as a result of decisions that were made in the planning phase. You have been in a position of having to rehabilitate major construction projects for the Air Force, and you have done so with success. Can you share some of the lessons learned and what steps you intend to take to further reduce costs and delays for major capital improvement and construction projects at other Air Force installations?

Mr. Henderson: Yes, Senator.

So, specifically, out of the Omaha District, for context for the audience, the Omaha District supported military construction, FSRM, on 11 Air Force bases as an Army command, and also did their environmental remediation

in the Defense -- program, supported that program for the Air Force in 43 States.

So I feel like I have a little bit of at least tactical and operational experience in this regard with the Air Force. So I will speak a little bit from that perspective. I will use the STRATCOM project as an example, because I think we have all learned a lot on that project, and that is probably where we have the most salient lessons learned for the MILCON program overall.

For background, first of all, if confirmed, I would absolutely would make it a top priority to identify the challenges that face our MILCON program. But I would focus on the challenges that occur early in the programming process with identifying the requirements. Sometimes the iterative design process that we go through, especially with prototype facilities like STRATCOM, and ensuring when it comes to the award of a project, that we have the cost estimates right, we have the requirements right, and we are ready to move forward, so that, during the construction phase, we do not face the cost overruns and time delays for having to finish the design during construction.

With regard to the STRATCOM project, we had about a 9 percent or 10 percent cost overrun on that project. That was primarily due to the fact that, when we got to the time to award the project, because it was such a critical piece

of national infrastructure, a very strategic decision was made to keep that project on schedule. But in order to do that inside the funding constraints of fiscal year 2012, we had to cut a big piece of the scope of the project out in order to award it on the assumed risk, the known risk, that the associated design changes that came with cutting that much scope out would have to be done during construction. That inherently results in hundreds of modifications to a contract and, therefore, the associated time delays and cost increases. And that was a decision that we made then.

And, to your question, Senator, about our lessons learned for that, I would say primarily in that case and applicable, probably, across the MILCON program, is, one, we need to ensure that we have the requirements right up front. As the requirements develop or mature or change during the design process and the process where the building owners come back to us and say, no, we need this, or a certain part of the facility has to be built a different way, if those result in significant cost increases, we have to have a mechanism where we can come back and say there has been a substantive change to the requirements, and, therefore, the cost estimate has changed. And we do not find ourselves in a situation like we did with STRATCOM, where our lowest bid comes back to $200 million higher than the money we had programmed. And that puts those projects at risk.

So I think with cost-estimating, it is something that has to keep up with design changes and nailing down the requirements. Then once we do award the project, what I have seen systemically across our MILCON program is we all have to do a better job at keeping track of the schedule, having scheduling experts there and making sure those schedules are properly resourced, so we know where we are at.

Senator Fischer: So you would think that changes made in projects, not just in the planning stages, but as you are carrying them out, would they be a major reason for cost overruns?

Mr. Henderson: Certainly, with regard to ensuring we have the requirements right up front and before the pre-award, making sure that the business done pre-award is correct, that would certainly reduce the number of cost overruns. And when we get into these situations where we do have to take risk and award a project because of national security concerns, like STRATCOM, then we should also have the flexibility to go out and maybe look at other procurement tools instead of a firm fixed-price contract, which kind of locks everything in, maybe a contract that is more suitable for the changes that are going to be known to come.

That is one of those areas, if Dr. Roper is confirmed,

that I am really looking forward to working with our acquisition community on, and making sure that we have the flexibility to use the right tool to get the mission done appropriately.

Senator Fischer: Thank you.

I had a question for Dr. Roper, too, but my time is out, so I would like to submit it for the record.

Thank you.

Senator Inhofe: Very good. Thank you.

Senator Shaheen?

Senator Shaheen: Thank you.

Congratulations to all of the nominees. Thank you for being willing to take on these important responsibilities.

Colonel Henderson, I very much appreciated your willingness to sit down with me and talk a little bit about some of the issues you will face, if confirmed. As we discussed, one of those challenges that is true not only in New Hampshire but across the country is the issue of perfluorinated compounds, commonly referred to as PFCs.

As we discussed, we have the former Pease Air Force Base in New Hampshire where those PFCs have contaminated the water in the city where they are located. The Air Force has been very responsive in coming in and addressing that problem. But it is an ongoing issue across the country, and the health of people who have drunk water that is

contaminated with those PFCs is a real question.

In this year's NDAA, the committee included provisions to require a health study. Will you commit that you will do everything you can to ensure that study gets done properly?

Mr. Henderson: Yes, Senator. As we discussed, my family and I have lived on Army posts and Air Force installations for the last 20 years, so we have been drinking that same water, so absolutely. If it is the CDC that ends up doing that human health study, you will have my full support, if confirmed, to ensure that that moves forward and that we are taking care of the long-term impacts of this.

Senator Shaheen: Thank you very much. Are you aware of any other initiatives that may help to mitigate the effects of PFCs?

Mr. Henderson: From my experience with the Corps of Engineers, because we did some of that environmental remediation, the initial response in remediation, the technical part of cleaning that up, I know that there are some alternative technologies. The PFCs on our bases, at least for us, have originated from the use of AFFF, the firefighting compounds, firefighting foams, that we are using.

So I think the key to prevent further contamination is to find new ways of putting out these types of fires on our

airfield. I understand that there are new chemicals and new ways of doing that that the Air Force is already using. As we heard on CBS last week, even though those are supposed to be safer chemicals, there are not perfluorinated compounds in them, there are compounds in them, and the Air Force is continuing to treat those as a contaminant even though they are not listed as such now. Remember, perfluorinated compounds, at least at these levels, at one time, weren't necessarily listed as contaminants either.

So the Air Force is already moving out and finding those alternative technologies. So one is finding alternative materials and two is adapting our processes to ensure no further contamination.

Senator Shaheen: Thank you.

Mrs. Bayer, a recent GAO report indicated that the overall physical condition of our public shipyards remains poor. As you may be aware, Senator King and I have a special interest in one of those public shipyards, the Portsmouth Naval Shipyard. The GAO report also indicates that they have not been able to fully meet the Navy's operational needs, our public shipyards.

So can you talk about how important it is, as we think about readiness, the health of the fleet, to ensure that our public shipyards have the infrastructure capacity they need to be fully efficient and operational?

Mrs. Bayer: Yes, Senator. Our public shipyards are critical to the Department of the Navy in terms of our ability to grow to the 350-ship fleet that we all, I think, believe that this country needs.

One of my top priorities is to look at that. I believe GAO had -- it is an estimated $5 billion of improvements that are needed for our shipyards, and looking at ways that we can work with the private sector to understand how we can configure shipyards and modernize them to best support the areas where we need to work.

And if confirmed, ma'am, it is one of the areas that is at the top of my list.

Senator Shaheen: That is great. Thank you. Actually, Navy Vice Admiral Moore has indicated that the Navy is proposing to request $10 billion over 20 years to improve those public shipyards, so I certainly think that is important for us to do.

I would like to ask both you and Mr. Henderson to talk about the importance of energy efficiency. When Secretary Mattis was confirmed, he talked about the importance of releasing our military from the tether of fuel, the challenges that he had faced in Iraq when he was there. Can you talk about how important it is and what initiatives you see to address energy efficiency and alternative sources of energy?

Mrs. Bayer first.

Mrs. Bayer: Thank you, Senator. Yes, the past administration made some tremendous progress in energy efficiencies, many common-sense approaches to save money. And a dollar saved on energy is a dollar that can be plowed back into readiness. I think those are very good things that, if confirmed, I would like to build on that.

One of my personal approaches is to make wise, informed decisions of every energy investment for the Department of the Navy, so that we are saving energy and reducing the risk to sailors and marines.

Senator Shaheen: Thank you.

I am out of time, so, Mr. Henderson, hopefully, I will get your answer later.

Senator Inhofe: Thank you.

Senator Rounds?

Senator Rounds: Thank you, Mr. Chairman.

Dr. Roper, as the Assistant Secretary of the Air Force for Acquisitions, if confirmed, you will oversee the purchase of the F-35A for the Air Force. The Air Force is currently scheduled to receive 1,763 F-35As. The Pentagon has recently said that DOD needs to significantly reduce the cost of the F-35 program while meeting requirements.

If confirmed, what actions will you take to make certain that the Air Force receives the entire F-35 order?

The reason why I am asking the question is I think we all saw what happened with the F-22. That aircraft, which clearly was the greatest fighter aircraft ever developed, was cut short in its production capabilities, and now we are wishing we had a whole lot more. I do not want the same thing to happen to the F-35A. And as we move forward, it is an open-architecture design, and we can plug and play with different and upgraded software packages a lot better than what we could with the F-22.

But what do you think needs to be done to make certain that, if we commit to this and that is the amount that is required, how are we going to make that stand long term?

Dr. Roper: Senator, if confirmed, I plan to do a very deep dive in the F-35 program. But I can tell you, from what I have seen in preparing for this hearing, there is at least a little good news in the F-35 program with the latest low-rate initial production lot being 7.3 percent cheaper than Lot 9.

So the production line, the production rates, are important. But the thing that gives me the greatest concern, at least at the point I am at now, is the sustainment of the F-35. So 1,763 aircraft, if the sustainment costs cannot be managed and lowered, then we could have a bow wave of cost and sustainment that would threaten the force structure that we buy, as well as the

block upgrades that we hope to pursue.

So I expect, as I learn about the program, that I am going to focus very, very pointedly on making sure that we understand sustainment costs, because if we do not, and we cannot free up funding to buy force structure and modernization, then we will end up with a fewer number of an aircraft that we do not really like. So expect me to drill on that very heavily, if confirmed.

Senator Rounds: Next question, different aircraft, B-21, the new stealth bomber, the Raider, in development right now, appears to be on time and on budget. Same issue, I think most reports indicate that the total bomber fleet necessary for all bombers is somewhere around 200. We have B-52s that are expected to continue in operation; B-1Bs that we are wearing out at a rapid rate, flying every single day; B-2s, a very limited number and probably one of the first that would be replaced by the upgraded B-21.

My question to you, once again, this is a case where, once these are in and operational, we are going to need the right number. How do we go about and what is your interest right now in maintaining, from day one, an attitude of, we are going to plan for the appropriate number based on need and not based upon the number of dollars we have in the budget?

Dr. Roper: So, Senator, I think that General Goldfein

has stated before, before Congress, that 175 is what the Air Force currently believes the needed force structure is. So, if confirmed, I plan to not only review that number, but review it in light of the National Defense Strategy that is going to be announced very soon, to make sure that is the number that we need.

Now presuming that it is, the next thing we need to do is make sure that the risk in the development and moving into manufacturing are tackled as early as possible. I am a big proponent of not letting risk accumulate in programs if we can spend money to do experimentation or prototyping earlier.

Now, I am very thankful that this committee made provisions available in the acquisition reforms that allow rapid prototyping within major defense acquisition programs if it is leveraging a commercial technology that could reduce costs. So expect me to be looking at the B-21 as a mechanism to use that authority, as well is the F-35, if confirmed.

Senator Rounds: Thank you.

Mr. Henderson, I think the chairman said it right. You have my vote for confirmation. But I did want to highlight something.

I think there are a number of areas that sometimes, when we get officers coming in with military experience, we

expect that they have a focus either in civil engineering or in combat relationships. But you have indicated that there were some things that you were really proud of with regard to your previous work and some of your accomplishments.

Very, very briefly, what are some of your proudest moments or the things that you take the most pride in that you have accomplished?

Mr. Henderson: Thanks, Senator. I think, first of all, I was very proud to work with a team of professionals out of Omaha, an amazing team. There was no one thing that I did, but I was very proud to be part of a team who did great things every day throughout the Midwest.

There are two primary things that are worth highlighting really quick I think that, as I look back, I am most proud of, while we did a lot of complicated and challenging things, we put together a third-party financed rehabilitation plan for the six power plants on the Missouri River Basin.

It is not a small endeavor. We put together a 25-year master plan, and then went out and found third-party financing that was in excess of $1 billion of funding that would displace the Federal funding required to do that rehab otherwise. It is a full rehab of the whole entire Pick-Sloan power plan on the Missouri River, a great deal for the Federal Government, because those plants generate about $250

million worth of revenue every year that goes back in the Federal Treasury. It is a good deal for the people in the Missouri River Valley, because it is a renewable source of energy. And it is good for our employees because, quite frankly, they all hit their design life. Those were becoming unsafe places to work.

The other thing was just the strategic investments we made in our future leaders. We revamped a leadership development program at the University of Nebraska, through their business school, to build the next leaders in DOD. And we sponsored a National Society of Black Engineers student chapter in Omaha North High School as part of a STEM initiative, to link them into people who were providing scholarships, to provide them pathways to success, show them what success looked like, and link them into people who do engineering and construction camps in the summertime, like the U.S. Air Force Academy and the U.S. Army Corps of Engineers Engineer Research and Development Center.

Both those things, from a strategic perspective, I think were probably some of the most important work we did there.

Senator Rounds: Thank you.

Thank you for your leniency, Mr. Chairman.

Senator Inhofe: Senator Peters?

Senator Peters: Thank you, Mr. Chairman.

And thank you to each of our witnesses today. Thank you for your willingness to take on very important jobs that you need to do with professionalism and with a great deal of energy. I am confident, if confirmed, you will do that.

My concern is about the future of technology, which many of you have mentioned, and how we need to stay abreast of our competitors and actually ahead of them in a rapidly changing world.

Earlier this week, I was at the North American International Auto Show in Detroit, in Michigan, and witnessed a number of autonomous vehicles that were on full display. That technology, as you know, is moving extremely rapidly in the commercial sector. Probably in the next 2 to 3 years, we have, perhaps, General Motors and Ford, for example, coming out with Level 4 self-driving cars coming off an assembly line without steering wheels and without brake pedals, something the American public may not be ready for yet. But it is coming quicker than folks anticipated. And that is certainly going to change the world dramatically on the commercial side. But it will also mean the nature of warfare will likely change in dramatic ways in the years ahead.

And, Dr. Griffin, you alluded to that.

And our competitors out there are aware of that. They are racing on the commercial side. You have this incredibly

fast development on the commercial side that all of our competitors are involved with, particularly the Chinese, in terms of developing the artificial intelligence necessary to pilot those automobiles through a complex city environment. And we all know whoever gets there first will have a significant competitive advantage when it comes to acquiring that technology, not just on the commercial side, but on the military side.

So my question for you, Dr. Griffin, if confirmed, DARPA will report to your office. And when I was there, I learned about an effort to help small startup companies kind of traverse the valley of death when it comes to taking their scientific discoveries and bringing them into applications. What I have learned as I have been out talking to these companies is that it is often difficult for them to get to the next stage, because they do not have, necessarily, the business plan and the types of things that American investors look for before they invest.

On the other hand, the Chinese will come in, and they do not ask any questions. They just buy the company. They just buy the technology. And it gives them a significant advantage in the ability to take those ideas and then use them themselves for both commercial and military purposes.

So this group, the Microsystems Technology Office, actually goes in and assists these small companies cross the

valley of death so that they can be viable and continue to provide technology to American companies and to the American military.

What are your thoughts on how we cross the research-development valley of death and help these small companies that will have significant technologies that have military applications?

Dr. Griffin: Thank you, Senator Peters, for that question. Without question, the issue of technology transition between innovative developments at DARPA and other components of our DOD and other Federal entities, transition of that into operational systems has been, really, the hardest problem we have. We do not suffer from lack of innovation. We suffer from the inability to get those into operational systems. A friend of mine once said that it is a little bit like Dante's Inferno, "Abandon all hope, ye who enter here," when it comes to technology transition.

So the difficulties, of course, are that the people who are innovators are generally not expert operators. They are not field people. Their expertise is not in operationally deployed systems. And the program managers that we have in the department and elsewhere in the Federal Government, they have exigent and current problems. And when you have a choice between spending money on bringing a new capability

into being, or spending money getting out the door what you were previously charged with doing, the urgent almost always overwhelms the long-term important.

It is very difficult to set aside and fence money specifically for transition. So one of the things I would like to do as just an idea, if I am confirmed, is I would like to more formalize the role of transition offices. We really do not have technology transition offices in the department, and have not. If we think we have a problem with transition, and I absolutely agree with you that we do, we have no disagreement on that at all, if we think we have a problem, I think the first step in solving it is to put someone in charge of it and give them that task.

I do not think that task properly belongs in DARPA, and I certainly do not think we can burden program managers with it. So we need an entity that we do not have. And, if confirmed, I would like to talk with you about how we can do that.

Senator Peters: I appreciate it, and I appreciate your recognition that this is a definite, serious problem that can have major implications, if we do not resolve it. So I will look forward, if confirmed, I will look forward to working closely with you and figuring out how we make that happen.

Dr. Griffin: I am very interested in that. Thank you,

sir.

Senator Peters: Thank you.

Senator Inhofe: Thank you, Senator Peters.

Senator Ernst?

Senator Ernst: Thank you, Mr. Chair.

And thanks to our nominees for being here today. It has been great to visit with a number of you.

Dr. Griffin, we had a great meeting yesterday. I appreciate that. I am going to continue a little bit about what Senator Peters was discussing, when we look at China, Senator Peters mentioned that.

During our meeting yesterday, you mentioned something that really struck a chord with me, given the recent focus we have had on our near-peer adversaries. While we were discussing China's military advancements, you noted, and I am going to quote, "The Chinese don't care about the niceties of our bureaucratic acquisition process." And I love that. It is too true.

It is very clear that we are not falling behind because we lack the talent, you have made that statement before, or the innovation to retain our competitive edge. We are falling behind because of the arduous acquisition process and, as noted earlier, our inconsistent budget.

Just so we can thoroughly understand the gravity of the situation we are in, can you please illustrate to us what a

Chinese-United States military overmatch will look like, if we do not find a way to make our acquisition process more efficient and agile?

Dr. Griffin: Well, I will try, although I can hardly classify myself as an expert on exactly what the Chinese are doing, Senator Ernst. I think we probably need to try a little harder to find out. I know what we are doing.

Our history demonstrates that the United States has the capability to do rapid program development. We have done this over and over again. There are classic examples, like the development of the first atomic bomb, 3 years and something from a not very well-formed idea to the capability that ended World War II. I spoke earlier about the SR-71, the stealth fighter, the F-117 stealth fighter. The examples go on and on.

We seem to have, in recent years, become so comfortable with our leadership and the ability to project U.S. power that we act as if we believe that others in the world could never catch up, and they can. Our decision processes, there are too many people in the loop, too many people who can say no, too much time which is allocated to allowing people to make these decisions.

I commented to you that the Chinese do not care about that. They are clearly in a rapid turnaround cycle. I do not want to say the number in this environment, but I will

say that, in a field in which I am particularly interested -- - hypersonics, for example -- they have done something like 20 times as many flight vehicle tests as we have done over a comparable period. This is a capability that they have developed and widely reported in public forums, such as Aviation Week and Space Technology, this is a capability they have developed that overflies our air defense, underflies our missile defense, and holds our sea and land bases at risk.

We have been watching it for 10 years, and yet I can sit here and make the statement, which I believe is a very close approximation of the truth, that they have done 20 times the number of tests in the last decade than we have done. Why are we allowing that to happen?

So whatever processes, rules, procedures are needed to cut through the kinds of timelines we have become accustomed to, that is what I am going to be pursuing. And I will ask your help to do it, if I am confirmed, Senator. Thank you.

Senator Ernst: Thank you. I appreciate it. And it just demonstrates to all of us that we do need a more agile acquisition system, and we do need to be a little more creative. I think it is very fair to say that the Chinese are easily outpacing us in some of their technological developments.

So I appreciate it. Thank you for spending the time

with me yesterday and walking through some of those examples.

Thank you, Mr. Chair.

Dr. Griffin: You are most welcome, Senator.

Senator Inhofe: Thank you.

Dr. Griffin: If I might make one quick follow-up comment, sir? We are not out of talent, but we are out of time. Thank you.

Senator Inhofe: Thank you, Senator Ernst.

Senator Warren?

Senator Warren: Thank you, Mr. Chairman.

And thank you to our witnesses for your willingness to serve.

Dr. Griffin, in 2007, when you were administrator of NASA, you were asked about climate change in an interview, and you were quoted as saying, "I am not sure that it is fair to say that it is a problem we must wrestle with," and, "To assume that climate change is a problem is to assume that the state of the Earth's climate today is the optimal climate."

Now, I understand that you later expressed regret for those comments, so what I would like to do is just offer you an opportunity to clarify your position for the record. Dr. Griffin, do you believe that climate change poses a threat to our national security?

Dr. Griffin: I completely agree with comments recently made by Secretary Mattis and others that, irrespective of what might be the underlying causes of climate change, that it is an issue that we must address in our national security and defense programs.

Senator Warren: So you believe it does pose a threat to national security?

Dr. Griffin: Yes, ma'am, I do.

Senator Warren: And do you believe that the Federal Government and, more specifically, the Department of Defense has a role to play in addressing climate change?

Dr. Griffin: I think the role of the Department of Defense, Senator, is to cope with its effects on our operations and our systems, and to be aware of the effects that might be produced on the movement of peoples and other strategic considerations with which we in the department have to cope.

Senator Warren: So if you are confirmed, will you commit to continuing ongoing defense research activities that are focused on mitigating the impact of climate change on our defense infrastructure and operations?

Dr. Griffin: Senator, I cannot make that commitment, because I am not aware of what programs we have in place. Until and unless confirmed, I cannot get into those things.

I would welcome the opportunity, if confirmed, to work

with you on that. But at this point, I am just not knowledgeable about what programs we might have in DOD.

Senator Warren: All right. So I appreciate your answers here.

The Pentagon has long assessed that climate change will continue to drive instability, that it will affect access to natural resources worldwide, and impact both the scope and the location of future missions. And in the 2018 defense authorization, this committee agreed that climate change is a national security threat.

We ignore that threat at our own peril, and we are counting on you to lead the department in adapting to it.

Let me see if I can ask you about another area in the time we have left.

If confirmed, you will be occupying a new role that was created as part of the split of responsibilities of the Under Secretary of Defense for Acquisition, Logistics and Technology. As I understand it, that split will formally take place next month, and so we will have these two separate positions, one focused on research and engineering, and the other focused on acquisition and sustainment.

I think having a senior leader focused on future technologies is incredibly important. But one of the real problems in our system right now, as Senator Peters was pointing out, we struggle to convert promising new

technologies from the lab into the field. And I am worried that splitting R&D from acquisition is going to make this problem worse. So if you could say a word briefly about how, if confirmed, you will ensure that our research and development program stays closely linked with the department's acquisition requirements and that these promising technologies are nurtured so they can be incorporated into programs of record?

Dr. Griffin: Senator, I share your concerns very deeply, which is why I was interested in accepting this position when it was offered to me. To get our technical, innovative capability that we have in this country into our operational systems is the crucial priority, and to do it more rapidly than we have been doing it is critical.

I believe the best path to that, and I strongly endorse the split that was made to which you referred, because I think it elevates the role of development by putting it under a separate leadership, so I would rely on extensive use of prototype development up through operational prototyping to be sure we have what we want before we commit to a major acquisition.

Senator Warren: All right. So bringing the research part a little further along so that it can stay closer to acquisition is what I am hearing.

Dr. Griffin: Exactly, Senator.

Senator Warren: Good. I am out of time, but I think I can get a yes/no question in here. The chair may indulge me.

I just want to make sure that I have your commitment to support DARPA, DIUx, and the Strategic Capabilities Office. This is where we are growing our new ideas, our new technology, and I just want to know that you are going to be a strong supporter for that.

Dr. Griffin: You have my unequivocal and strong support for those entities. I am delighted with what they have done.

Senator Warren: Me, too. Thank you very much.

Thank you, Mr. Chairman.

Senator Inhofe: Thank you, Senator Warren.

We want to take this opportunity to welcome the newest member of the Senate Armed Services committee, Senator Scott. Welcome. We are looking forward to great things from you.

Senator Scott: Thank you very much, sir.

And good morning to the panel. Specifically to Dr. Roper, my brother spent 26 years in the Air Force as a colonel. He retired as a colonel over maintenance. So you can imagine the number of times that my brother talked to me about the fact that we have many planes that are older than the pilots. I am not sure if he was trying to allude to

something, but certainly, the importance of updating our fleet is a critical part of our readiness for our men and women in service.

So I am excited about the F-35s. Frankly, in South Carolina, Buford, the Marines are preparing pilots for the future through the F-35s. The recent GAO study suggested or highlighted the serious challenges the department faces in sustaining the current and future fleet. If confirmed, how would you propose to ensure the F-35 program has a rational and affordable sustainment plan?

I was here when you were talking with Senator Rounds about this, but this seems to be a critical component. As I read through the GAO study, it suggested that the sustainment plan could cost $1 trillion over the lifetime, a 60-year lifetime.

Dr. Roper: Senator Scott, I am glad you asked about maintenance. And thank you for your brother's service to the Air Force.

The maintainers are the heart of the Air Force in many respects, because if the planes cannot fly, then they are not operationally viable. So I have just been impressed in my current job, just learning how much effort it takes to keep the Air Force up in the air, and it is something I have come to deeply appreciate.

Sustainment is not the sexiest thing to talk about in

the world of technology. I feel like it and maintenance are the ugly sister or the ugly sibling of performance.

Senator Scott: I agree with that comment about my brother. Yes, go ahead, continue.

[Laughter.]

Dr. Roper: I am deeply concerned about the sustainment issues of the F-35. So, if confirmed, one of the first things I want to look at is the sustainment plan and to make sure that there are not optimistic assumptions or this confluence of events that have to all happen to get the price down.

The reason I mentioned that sustainment doesn't often get the same focus as development is I am not certain, from my current job, that sustainment is getting the same R&D effort that new capabilities are, performance capabilities. And so if I see any risk in the F-35 program, in sustainment, if confirmed, I plan to look to see are there any technologies, are there any industry technologies, industry practices, that we could start experimenting with and applying now to make us feel more confident that the cost as predicted is the cost that will actually be real.

Senator Scott: Thank you, sir.

Thank you, Mr. Chairman.

Senator Inhofe: Thank you.

Senator King?

Senator King: First, I would like to add my voice in welcome to Senator Scott to the committee. We look forward to working with you. I think you will find this is an interesting, important, and hardworking committee. So we are delighted to have you with us.

Mr. Griffin, following up a little bit on Senator Warren's questions about the structure, there is a concern that we took one job and made it into two and that there will not be adequate communication. I am worried about the handoff. You are developing, you are doing R&D, the handoff to commercialization and acquisition. Talk to me a bit about how you will deal -- you are the first person in this job, and how you do it and how you formulate your policies and procedures will have an effect long into the future.

So talk to me a bit, briefly, about how you intend to deal with the possibility of a gap in the handoff process.

Dr. Griffin: Well, I am, if confirmed, the first person to hold this position under the new law, and it is the first major defense reorganization since Goldwater-Nichols in 1986. But this is a problem we have dealt with in the department before. When I was a much younger professional, we had developments of exactly the type that I hope to do in new fields, and we managed to hand those off for weapons systems acquisition without dropping the ball.

I mentioned some examples of those earlier prototypes.

I will give another one. GPS, which is utterly essential both to the way we fight war today and to our economy, was an Air Force acquisition system that came out of our National Laboratories, to include the Naval Research Laboratory, right here in town. We flew a couple of prototype satellites. We did ground tests at White Sands before going into major weapons system acquisition. That handoff was accomplished very smoothly.

Senator King: It sounds to me like you are focused on this issue. You were talking about the length of time, and that is another issue.

I will commend you a term that I often use in my office, that people are getting tired of hearing. When people come to me and say it is going to take multiple years to do something, I remind them that Eisenhower retook Europe in 11 months, and that should be the standard. We should not be talking about years and years and years to develop a new handgun or even a new major weapons system.

Mrs. Bayer, we can talk about climate change in a variety of ways, but one is sea level rise, and it is happening. It is visible, and it seems to be accelerating. I would like you to commit to, as part of your position, doing a study or commissioning a study of Naval resources, Naval assets around the world, and what the effect will be of various levels of sea level rise. I think we need to

know where our problems are. I know Norfolk, Virginia, for example, is already experiencing very frequent flooding, much more so than ever in the past.

Is that something that you think would be an appropriate part of your job?

Mrs. Bayer: Senator, it is one of my top priorities, if confirmed in the job. I understand that Norfolk, Jacksonville, most of the Navy bases, obviously, the Navy facilities that are on coastlines, are experiencing more flooding, rising sea levels.

I believe it is the Sewells Point Flood Gauge in Norfolk that shows where the sea level has risen between 8 to 10 inches since it was measuring the waters there, I believe in the late 1920s. It is affecting the infrastructure, and it is adding to the expense of the department's infrastructure costs and maintenance.

I understand that Congress has asked the department for a study of the 10 most vulnerable installations. I commit to you, Senator, that in the effort that the Department of the Navy will be contributing to that study for the Department of Defense, I will look even further into those issues.

Senator King: Thank you. It just seems to me, if we identify the most serious spots, we will be able to address them. And I think it is also important for the public to

understand the costs, that this is not an abstract problem. This is a practical dollars and cents problem.

Mrs. Bayer: Exactly, Senator. It is a real problem.

Senator King: Dr. Roper, in a few seconds left, I want to commend you for your focus on sustainment cost. I take it that is another term for life-cycle cost, what the cost of maintenance is going to be. I think that is extremely important. And as you say, it is one that often doesn't get the attention.

You are going to be managing a very important program, and that is the B-21. And, if Senator McCain were here, he would be talking about accountability. He is always looking for who we can fire.

[Laughter.]

Senator King: You are going to be accountable, I think, in many ways for the B-21. It is already started. The process has started. The contracts are let. But I hope that you will really ride herd on that program. If that turns into another F-35, I will hunt you down.

[Laughter.]

Dr. Roper: Senator, point taken. If confirmed, I will certainly keep both eyes on the B-21. And from what I know in my current job, it seems like it is off to a good start.

Senator King: That is my impression, as well.

Dr. Roper: But for very complicated systems like this

that have to be integrated more and more as you get closer to production, I feel like that is the place we have to keep our eye on.

And across-the-board, I am always concerned about when the government is dealing with a system that is driven by a lot of software. And for the Air Force, that is increasingly everything. I do not think our software development, acquisition, and sustainment processes look like companies that are working in modern software, like Google, Amazon, Facebook. And so what I am hoping to do, if confirmed, is to try to take some of those industry best practices and figure out how we apply them to our acquisition system, because the upgradability and sustainment of commercial software is easy. Apps update all the time, and your phone doesn't crash. We need to be able to do the analogue of that in our military systems.

Senator King: I appreciate that. My time is up, but an important fact that I just realized fairly recently, of the approximately $700 billion defense budget, $300 billion is personnel and what we would call active work. $400 billion is contracts for services and products. It really shows us where the money is and where we have an opportunity to really find some efficiencies.

Thank you, Mr. Chairman.

Senator Inhofe: Thank you, Senator King.

Those of us who are on the Commerce Committee will have to be leaving for an emergency meeting. Senator Rounds is presiding.

We recognize Senator Sullivan.

Senator Sullivan: Thank you, Mr. Chairman.

And I think Senator King is channeling Senator McCain here. "Hunt you down," 3 years on the committee, I am not sure I have seen that. So you guys are getting really roughed up by the Senator from Maine.

[Laughter.]

Senator Sullivan: But I agree, though, with that sentiment very much.

I want to welcome everybody. I want to thank all of you for desiring to serve your country and your families. These are not easy jobs, and a lot of you already have a tremendous background in public service, so thanks for that.

I really believe this is a very well-qualified panel, getting to meet most all of you and looking at your backgrounds. So thanks very much for the willingness to serve your country.

I want to begin first with an article that was in the Wall Street Journal by a well-known foreign policy expert just a couple weeks ago, Paula Dobriansky, called, "A Cold War in the Arctic Circle."

Mr. Chairman, I would like to submit this for the

record.

Senator Rounds: [Presiding.] Without objection.

[The information referred to follows:]

[COMMITTEE INSERT]

Senator Sullivan: The article begins by saying, "The Arctic is a region of tremendous strategic importance for global trade and national security. The High North is also experiencing a massive Russian military buildup, which calls for the U.S. and NATO to adopt a new strategy," but then later notes there is not a single Western military facility in the Arctic and only a few U.S. Coast Guard assets operate there.

Mrs. Bayer, Secretary Mattis has stated that the Arctic is key strategic terrain. The Russians are taking aggressive steps to increase its presence there. And in the NDAA in fiscal year 2017 and fiscal year 2015, this committee focused a lot on the Arctic. The Pentagon hasn't been, but sometimes the Congress is actually in front of the generals and the folks at the Pentagon.

Another example, the Russians have 40 icebreakers. They are trying to control the new sea lanes as the sea ice recedes, building 11 more. They have 16 new deep-water ports, over 10 new airfields, in the Arctic. We have no ports, two icebreakers. One is broken.

Have you read the new U.S. Arctic strategy, and are you familiar with the new strategic Arctic port concept, both of which were passed by the Congress, both of which passed this committee unanimously, and both of which, in my view, are being blown off by the Pentagon? Are you familiar with

these?

Mrs. Bayer: Yes, Senator, I am.

Senator Sullivan: If confirmed, can I get your commitment to fully and seriously take a hard look at both of these, particularly the strategic Arctic port concept, and to ensure that we have the infrastructure and assets, particularly with regard to ports, that we need as a Nation, so we can respond to what has clearly been identified as a massive Russian buildup in the Arctic?

Mrs. Bayer: Yes, Senator, you do. It is a very important region, and it is increasingly so, as you have well pointed out.

I know that this is also of great concern of Secretary Spencer. And if confirmed, I will do everything I can to support the infrastructure -- the decisions of our department and our country to have a presence in the area.

Senator Sullivan: Great. Thank you. I just want to emphasize, again, this committee has been very bipartisan in its focus on this, and yet, when we go back to the Pentagon, it is kind of like pulling teeth, and that needs to end.

And I appreciate your commitment to take what we have been trying to do here, which is sound the alarm, much more seriously.

Dr. Roper, Dr. Griffin, I appreciate, again, your willingness to serve, both of you. You have strong

backgrounds. I just want to really encourage you, as we are thinking through the acquisition system, to be bold. I do not think that the good ideas of really, really reforming this system, which is completely broken and bureaucratic, are going to come from this body. They are going to come from outsiders with tremendous experience, like both of you.

So literally look at blowing up the entire system. Give us ideas of what we can do to fix it, to turn around new technologies, field them.

Let me ask one question as it relates to missile defense, and I know I have had a discussion -- Dr. Roper, I appreciate our discussion with you. Again, on this issue, I think Congress has been in front of the Pentagon. We passed major legislation this year. It is all funded. But one of the things, as I have looked deeply into the missile defense issues and the technology, is our culture of testing, or really a lack of testing.

And, Dr. Roper, you have talked about this idea of a fast failure. Can you expand upon that and give us a sense-- you may have seen in the NDAA, in terms of missile defense, we are encouraging much more rapid testing. It is okay to fail, if you are learning. When we put together our space systems in the 1950s and 1960s, we were failing all the time. But we were advancing, so it was not really failure.

Can you give me a sense of how we should be looking at that issue, particularly with regard to missile defense, but even more broadly with regard to the Pentagon, new technologies, and the ability to acquire them quickly?

Dr. Roper: Senator, I completely agree. We have discussed a couple of examples today of where frequent testing and failing fast gets you to success. Dr. Griffin mentioned the frequent hypersonics tests by the Chinese, and we have talked earlier about the experimental plane heyday of the department, where we took one big step in every new plane, but not multiple steps. And so if that step failed, the information of the failure, why it was caused, went back to the engineers so that they could try to fix it. But if it succeeded, then you moved up to a new platform, a new echelon, and take the next step.

That is just prudent engineering, and we have moved into a culture where we test to verify, not test to learn. And for these very complicated warfighting challenges, like missile defense, we need to know where the system breaks.

And so I would like to see, across the board, especially with people like Dr. Griffin potentially coming in, if confirmed, to just get back to good, sound engineering, where failure is discovery, and there is such a thing as a negative failure, if it ultimately leads you to success.

Senator Sullivan: Thank you.

Senator Rounds: Senator Heinrich?

Senator Heinrich: Thank you.

Colonel Henderson, I would like to start with you this morning. As you know, Kirtland Air Force Base in Albuquerque is home to a number of missions, including the Nuclear Weapons Center. As you know, Kirtland is mired in a process with a fuel spill that literally dates back decades now and threatens Albuquerque's groundwater supply. And for too long, the cleanup of the spill has been fraught with delays and, for that matter, too little discernible progress.

Back in 2015, we really started to see that turn around in a real partnership between the base and the local community. Things were moving in the right direction. Trust was being restored with the local community. In recent months, that seems to have lost a good deal of its momentum.

So I want to ask you, if confirmed, if you would commit to making this fuel spill cleanup at Kirtland Air Force Base a priority?

Mr. Henderson: Yes, Senator. I absolutely would make it a priority, if confirmed, and work to provide resources for any previous commitments that the Air Force has made.

Senator Heinrich: Do you have thoughts about what

actions could be taken to just improve the communication, once again, between the Air Force, the State regulatory agencies, and local regulatory stakeholders, like the Albuquerque Bernalillo County Water Utility Authority, and how we can regain that trust with the local community that really created an environment where a lot of progress was being made?

Mr. Henderson: As I mentioned in my opening statement, Senator, our relationships and our partnerships with the communities have to be founded on trust initially. My previous experience with the Corps of Engineers in doing just this, cleaning up formerly used Defense sites throughout the Midwest, each one of those, it is emotional, especially if it is threatening groundwater or threatening civilian infrastructure. And I think it takes leadership on the ground, it takes involvement, and it takes engagement, and it takes that establishment of trust.

And the first part of building a strong team that is based on trust is exhibiting actions that are worthy of other people's trust, and secondly, to treat all stakeholders at the table with dignity and respect, and understand they are stakeholders. But you cannot do that if you are not at the table.

So, if confirmed, with regard to Kirtland, specifically, and any other of these issues with emerging

contaminants and cleaning up former Defense sites that the Air Force may be responsible for, you have my commitment to be personally involved in those processes and to ensure that we have relationships based on trust with the members of this committee and the partners in our community.

Senator Heinrich: I appreciate that deeply. And I think you will find, myself, I started my career at Kirtland Air Force Base, our delegation loves that facility. We are very proud of it. But we want to make the progress that the community expects and deserves there. And I want you to count me as a partner to make that happen as expeditiously as possible.

Dr. Griffin, I want to pivot to you for a moment. As you know and we talked about yesterday, last year, this committee worked on a bipartisan basis with industry and a number of advocacy groups and the military services to establish a program under Section 215 of the NDAA that will focus on getting directed energy weapons, like high-energy lasers and high-powered microwaves, out of the labs and into the hands of our warfighters.

Can you talk about your support for that kind of program and how you feel about making sure it has the staffing and the resources it needs to make that transition?

Dr. Griffin: Well, that is an easy one. I would absolutely love to take on that challenge.

Senator Heinrich: It was designed to be easy, so.

Dr. Griffin: Thank you. My support in the professional community for directed energy weapons and a renewal of that that has been enabled under Section 215 is longstanding. The last time that I was in the Pentagon, 27 years ago, I owned, under the Strategic Defense Initiative organization, our Nation's directed energy research and development. We have, in the intervening years, given that less priority by far than I think it deserves.

So count me on your side with that commitment.

Senator Heinrich: I look forward to working with you on this. Your history and your background are really encouraging. And count me, as well, as somebody that will be there to help you to be successful in that endeavor.

I am out of time. I have a few questions for the record that I will get to you, as we mentioned yesterday, about test ranges and some of those issues, too. And we will let you take those on for the record.

Dr. Griffin: I look forward to that. Thank you, sir.

Senator Heinrich: Thank you.

Senator Rounds: On behalf of the chairman, Senator Cotton?

Senator Cotton: Thank you all for your appearance today. Thank you all for being willing to serve your country.

Dr. Griffin, obviously, one of the most urgent threats we face is the nuclear missile threat from North Korea. We have our Ground-Based Interceptor on the West Coast and Alaska. But what do you think is the feasibility of having boost-phase missile defenses deployed on a rapid basis, in particular airborne boost-phase missile defenses, in the years ahead?

Dr. Griffin: I think it is very feasible to do it. It was feasible to deploy boost-phase defenses, particularly against a nation with the geography of North Korea. It was feasible many years ago to do it. What we have lacked in the missile defense arena, until recently, is the will, not the technology and not the means.

One of your colleagues pointed out earlier in his remarks that we now have a situation where the Pentagon is leading the department in its advocacy for this. I am sorry, excuse me. Forgive me. Where the Congress is leading the department, is ahead of the department, on this.

And if confirmed, you will not be ahead of me in your advocacy for this capability. I strongly support such developments.

Senator Cotton: Well, thank you for that. I appreciate the answer. I appreciate your commitment to it. I do believe it is one of the most immediate solutions we could have to this particular problem, to have airborne

boost-phase defenses in northeast Asia.

Dr. Griffin: I do as well, and I apologize for stumbling over my tongue.

Senator Cotton: Quite all right. I have been accused of doing it more than once myself.

The B-2 bomber, Dr. Griffin, was originally set to have 100 units, and we ended up getting, I think, 21. That drove the cost of the bomber up to $2 billion per aircraft. We are now, I think, about 18 months in the B-21 program. It is a program I oversee as the chair of the Air and Land Subcommittee.

Could you talk about how the department should go about ensuring that we do not have another situation with the B-21 that we had with the B-2 and, frankly, also with the F-22 and the F-35, the cost overruns, the time delays that end up causing Congress or the department to cut back on the buy, which only drives up the per unit cost on this very critical weapons system?

Dr. Griffin: I am, of course, not familiar, not yet being confirmed. If confirmed, I will do everything in my power to support Dr. Roper's efforts, if he is confirmed, to make sure that the B-21, which all parties have said has started well, that we keep it continuing well.

Yes, when programs get off track and we use up a huge amount of the available money on development, it leaves us

less free to buy copies that we wanted, and we end up paying a very high per-unit price. The remedy for that is to stay on top of programs, catch issues early, have the mettle to fix those issues when they need to be fixed and not kick the can downstream.

That describes my approach to program management, and if confirmed, I will do everything in my power to make sure that we have these capabilities go forward the way we want them to do.

Senator Cotton: Thank you, Dr. Griffin.

Dr. Roper, Dr. Griffin did not toss the hot potato to you, because I was coming to you anyway, going from OSD to Department of the Air Force. Could you address that issue, please?

Dr. Roper: Yes, Senator Cotton. I agree with Dr. Griffin's points.

There are not a lot of mechanisms, currently, to feed discovery data back into design. We fix the design, and then we have to build it. And if the design is harder than we originally anticipated, we can end up with a program that has snowballing risks that ultimately lead to cost overruns and delays.

The committee, and I am very thankful for this, has approved authorities that allow a lot more experimentation and prototyping within the large, major defense acquisition

programs. If confirmed, I fully plan to leverage them in the big programs to try to pull as much risk to the left, empower program managers to deal with problems. They do not have a lot of tools, currently, other than just hoping that somehow it works out. And so I think empowering program managers with good, old-fashioned engineering practices is going to do a lot to help get programs back on track.

Senator Cotton: Thank you. My time is nearly expired. I could go on, but I will not.

Mr. Henderson, Mrs. Bayer, thank you for being willing to serve, as well. You all are going to be performing incredibly important tasks, not just for today's warfighters, but equally important for tomorrow's, who are going to be driving in the vehicles and flying in the aircraft and sailing on the ships that you will be overseeing. So thank you all.

Senator Rounds: On behalf of the chairman, Senator Kaine?

Senator Kaine: Thank you, Mr. Chair.

And thanks to the witnesses. Congratulations on your nominations and willingness to serve.

I have been on the committee for a little bit over 5 years, and we have grappled with such important issues in the committee: North Korea, cyber, Iran, Russia, China, military sexual assault, veteran and military suicide,

military pay and benefits. But if I would do a word search of words over 5.5 years, the single issue that we have talked about the most has been budgetary dysfunction.

I came in right at the point where the sequester that had been voted on in August 2011 was about to go live, on March 1st of 2013. And from the witness table and from the dais, again and again and again, what we have talked about is budgetary dysfunction, about the absence of certainty and how much difficulty that puts on the military mission planning, acquisition, research, readiness, training, installation, MILCON construction. Not having certainty is a huge problem.

Recently, Secretary Mattis came and spoke to both caucuses, the Republican and Democratic caucus, and looked us in the eye in the last 10 days and said: Please, do not give me another continuing resolution. Get a forward-looking budget deal that looks in the windshield rather than just operates out of the rear-view mirror.

I assume that each of you, in your own work to this date and going forward, also share the concerns about budgetary uncertainty and dysfunction, and how it affects the particular positions into which, should you be confirmed, you will be soon entering.

And if you just want to confirm that or talk a little bit about it, that would be great.

Dr. Griffin: Well, as someone who has had to manage programs under circumstances of fiscal instability, I would say that even more than the fear of encountering a technical problem, a real, live program manager worries about what is going to happen to his government budget a year out.

If you do not know how much money you have, you have to plan for having less. And if you have to plan for having less, that means you make decisions now that are done under the most pessimistic circumstances. And then if you found out later that you actually got the money you requested, well, now it is too late, because you cannot be as effective with it.

In one of the few examples in recent decades of the benefits of such knowledge, I will go back to my NASA experience and say that, when we lost the Space Shuttle Challenger, the Congress authorized a replacement. The agency was given the full amount, full appropriation, for that replacement at one time. The agency delivered the replacement orbiter on time and under budget.

In an arena, the frontiers of aerospace, not noted for cost and schedule containment, they managed that accomplishment. I do not think it was unique to that agency, nor do I think it was unique to those people. It illustrates what can be done when program managers know the resources that they have with certainty.

So I strongly endorse Secretary Mattis' comments.

Senator Kaine: Thank you, Dr. Griffin.

Others? Mrs. Bayer?

Mrs. Bayer: Senator Kaine, thank you.

As I said in my statement, I have seen the senseless expense of continuing resolutions. It is such a waste. And you have my commitment to conduct frequent and hold my people accountable to our costs when those costs come in for projects, particularly in our MILCON area, to address huge backlogs. And, yes, it is a priority for me.

Thank you.

Senator Kaine: Thank you, Mrs. Bayer.

Mr. Henderson?

Mr. Henderson: Senator, no unfamiliar subject to this committee, but in the facilities and installations accounts, because of the Budget Control Act and other funding uncertainties over the last several years, our installation accounts have taken an inordinate hit and developed a huge backlog of sustainment and repairs and maintenance on the facilities.

As any engineer will tell you, if you defer what is routine maintenance on those facilities, the cost escalates by deferring those into the future of having to fix them. And also, especially with the Air Force portfolio, because our installations are used primarily as power projection

platforms for our aircraft to their contingency locations, it infuses risk into the Air Force mission if those facilities are not well-maintained and taken care of and ready to fight tonight, so to speak.

So the budget uncertainty not only impacts the quality-of-life and work for our airmen, they impact our ability to get our mission done, and it is a serious concern for the Air Force.

Senator Kaine: Mr. Chairman, might I ask if Dr. Roper could answer, as well?

Dr. Roper?

Dr. Roper: Senator, I currently deal with the budget uncertainties in my current role. And I can tell you, it is like learning the art of taking a punch well. It is not really an art that you should have to learn as a program manager.

The thing that should make you worried are the technical challenges, the cost management of the programs. But when you do not know whether you are going to be able to start or stop, you do not know when the budget will pass or not, it is just very difficult to make any kind of forward-looking decision that looks strategic and that looks like it is moving toward efficiencies and economies.

So I can only imagine what it would be like to manage a budget if I knew what it would be year to year to year.

Senator Kaine: Well, I appreciate all your testimony. I mean, the interesting thing is, just 9 days after the Secretary looked us in the eye and said, Don't give us another C.R., do not give us another C.R, there is going to be a vote today in the House about whether we continue to punt the can down the road.

I am not sure you punt a can, but anyway, I think we can do a lot better. I think we owe you, and I think we owe everybody in our military, a lot better than that.

Thank you for your testimony.

Thanks, Mr. Chair.

Senator Rounds: On behalf of the chairman, Senator Gillibrand?

Senator Gillibrand: Thank you, Mr. Chair.

Mr. Henderson, I trust you are aware of continuing -- let me start again. Welcome, all. How are you?

Mr. Henderson, I trust that you are aware of continuing contamination issues with water supplies across the United States. The Air Force, including the Air National Guard, is dealing with contamination as a result of chemicals known as PFCs expelled by firefighting units on these bases.

There are two known sites in New York, one at the 106th on Gabreski, and one at the 105th in Newburgh. My understanding is that cooperation has now begun again between the community and the base in Long Island, but not

in Newburgh.

In last year's defense authorization bill, we required the DOD to come back to us with language to allow for cleanup of Guard and Reserve bases. The language was due last week, and we are still waiting. Are you aware of this issue?

Mr. Henderson: With regard to the status of the language, I have just been made aware of it, Senator.

Senator Gillibrand: Okay. Do I have a commitment from you to work with my staff and the committee to address any problems with authorities and to move the process forward expeditiously?

Mr. Henderson: Yes, Senator.

Senator Gillibrand: Thank you. The communities do not have the luxury of waiting to clean their water. Do I have your commitment to work with my office and the relevant local authorities to address adverse consequences resulting from the delays on the part of the department?

Mr. Henderson: Absolutely. If confirmed, I am fully committed to the health and safety of our servicemembers, their families, and the surrounding communities, as a matter of highest priority.

Senator Gillibrand: Thank you.

Mr. Henderson: Yes.

Senator Gillibrand: Mr. Griffin, I believe the

Manufacturing USA network is critical to ensuring the United States remains a global leader in manufacturing. Part of this bipartisan program's mission is to use these public-private partnerships to develop and commercialize new defense technologies that are critical to our men and women in uniform, like 3-D printing and smart sensors. In fact, the Defense Department is leading eight out of the 14 current institutes within the network, including one focused on integrated photonics located in Rochester, New York.

You will be responsible for manufacturing research programs, including the network of manufacturing institutes run by the DOD. What are your plans on ensuring that we have the most advanced manufacturing capabilities to support our industrial base?

Dr. Griffin: Since I am up for confirmation and not yet confirmed, I have not been able to look in detail into those programs, but I am broadly familiar with them and strongly support. This Nation has to be in the forefront of manufacturing technology, just as we need to be in the forefront of innovation, so you have my commitment of support for those efforts.

Senator Gillibrand: Great, thank you.

Mrs. Bayer, the Navy operated a naval weapons industrial reserve in Bethpage, New York, beginning in the 1930s, which has resulted in at least two plumes containing

chemicals classified as carcinogens. Since the identification of contamination concerns in 1976, the plume has spread and is currently threatening over 20 additional public drinking wells that serve over 250,000 Nassau County residents in Bethpage, Levittown, Massapequa, South Farmingdale, and Wantagh.

In the fiscal year 2018 NDAA, I worked to secure an amendment authorizing $23 million in Federal funding from the U.S. Navy's environmental restoration fund, which allows the department to identify, investigate, and clean up former waste disposal sites on military property. This environmental restoration funding authorized in the NDAA is critical to restoring and protecting drinking water for thousands of people on Long Island.

Are you aware of this issue?

Mrs. Bayer: Yes, Senator, I am.

Senator Gillibrand: And if confirmed, do I have your commitment to take a close look at the situation in Bethpage and how to ensure that it gets cleaned up?

Mrs. Bayer: Absolutely, ma'am.

Senator Gillibrand: Thank you very much.

One last question for Mr. Griffin. I am concerned about manufacturing supply chain assurance against counterfeit parts and ensuring ready access to trusted microelectronics. We must ensure that there is a long-term

strategy for the development of trusted microelectronics that can withstand any future problems of the international supply chain. Ensuring access to an assured supply chain for microelectronics has been a priority of the committee for many years, but U.S. manufacturers have had trouble sustaining a market for domestic-produced microelectronics. Investing in equipment, techniques, and development within the United States is essential to maintaining the ability to produce assured microelectronics.

What steps do you think we should be taking to make sure we have trusted and assured sources of microelectronics for use in the defense systems?

Dr. Griffin: Senator, this is one of my personal hot buttons, as I can see that it is with you. It frightens me to think that the sources of supply for much of our microelectronics is offshore.

Senator Gillibrand: Yes.

Dr. Griffin: We are inappropriately allocating success in the commercial marketplace as the only criteria by which our microelectronics industry should be working. The fact is that our microelectronics industry is a key part of national security. And if it needs support from the U.S. Government to remain viable and sustainable and competitive, then I think we must be prepared to do that, because the alternative is to depend upon offshore sources for our

microelectronics, and I think that opens vulnerabilities that are difficult to assess, impossible to contain, and with which we just cannot cope.

Senator Gillibrand: Thank you. I look forward to working with you.

Thank you, Mr. Chairman.

Senator Rounds: With that, I would like to take this opportunity, on behalf of the chairman and the ranking member, to thank all of our witnesses for their participation in this meeting today. You most certainly have been enlightening to the entire panel.

Since there is no other business to come before the committee at this time, the committee meeting is adjourned.

[The information referred to follows:]

[COMMITTEE INSERT]

[Whereupon, at 11:26 a.m., the hearing was adjourned.]