

**DEPARTMENT OF DEFENSE APPROPRIATIONS
FOR FISCAL YEAR 2019**

THURSDAY, MAY 17, 2018

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:03 a.m. in room SD-192, Dirksen Senate Office Building, Hon. Richard Shelby (chairman) presiding.
Present: Senators Shelby, Collins, Murkowski, Daines, Hoeven, Durbin, Leahy, Tester, Udall, and Schatz.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE AIR FORCE

OFFICE OF THE SECRETARY

STATEMENT OF THE HON. DR. HEATHER WILSON, SECRETARY

OPENING STATEMENT OF SENATOR RICHARD C. SHELBY

Senator SHELBY. The subcommittee will come to order. This morning we are pleased to welcome Secretary Wilson and General Goldfein to review the Air Force 2019 budget request. Here the Air Force is requesting \$156.3 billion, an increase of about \$4.6 billion over amounts appropriated for 2018, and it's an amount consistent with the 2-year budget deal passed earlier this year by us.

The Air Force budget request recognizes the challenges posed by long-term competition with China and Russia and builds on the progress of the 2018 budget to restore readiness, increase lethality, and cost effectively in the modernization era. Restoring readiness to support a total force of 500,000 Airmen and over 5,000 aircraft must remain a top priority for this committee. However, investments that maintain our edge on the battlefield are also critically important, tomorrow's weapons, in other words. We must continue to address such areas as hypersonic weapons and artificial intelligence that will maintain our technological advantage into the future. At the same time, we must continue to manage programs currently in production, such as the F-35 Joint Strike Fighter and the tanker replacement program.

Secretary Wilson and General Goldfein, we appreciate your service to this country, and we look forward to hearing how your budget balances all of these important priorities that we need for national security.

[The statement follows:]

PREPARED STATEMENT OF SENATOR RICHARD C. SHELBY

The Subcommittee will come to order.

This morning, I am pleased to welcome Secretary Wilson and General Goldfein to review the Air Force fiscal year 2019 budget request.

The Air Force is requesting \$156.3 billion, an increase of about \$4.6 billion over amounts appropriated for fiscal year 2018, and an amount consistent with the 2-year budget deal passed earlier this year.

The Air Force budget request recognizes the challenges posed by long-term competition with China and Russia, and builds on the progress of the 2018 budget to restore readiness, increase lethality, and cost-effectively modernize.

Restoring readiness to support a total force of 500,000 Airmen and over 5,000 aircraft must remain the top priority, however, investments that maintain our edge on the battlefield are also critically important. We must continue to address areas such as hypersonic weapons and artificial intelligence that will maintain our technological advantage into the future.

At the same time we must continue to manage programs currently in production, such as the F-35 Joint Strike Fighter and the tanker replacement program.

Secretary Wilson and General Goldfein, we appreciate your service and look forward to hearing how your budget balances all of these important priorities.

Now I turn to the Vice Chairman, Senator Durbin, for his opening remarks. Thank you.

Senator SHELBY. Senator Leahy, do you have an opening statement?

STATEMENT OF SENATOR PATRICK J. LEAHY

Senator LEAHY. Just briefly, Mr. Chairman. Senator Durbin is delayed at a meeting with another committee, but he's going to join us shortly. But I am delighted to see the Secretary of the Air Force, Heather Wilson, here, and Chief of Staff of the Air Force, General David Goldfein.

I know one of the top priorities, and these are two who really are working hard on this, that the Air Force has been changing the way it does business, especially in the way it purchases aircraft and other equipment. The reform of the acquisition system is promising.

And with that, I want to just turn and yield to Senator Durbin. Senator SHELBY. Senator Durbin.

STATEMENT OF SENATOR RICHARD J. DURBIN

Senator DURBIN. I apologize for being late. I'll put my opening statement in the record.

Senator SHELBY. Thank you. Without objection, it's so ordered. [The statement follows:]

PREPARED STATEMENT OF SENATOR RICHARD J. DURBIN

Mr. Chairman, I am pleased to join you in welcoming the Secretary of the Air Force, the Honorable Heather Wilson, and the Chief of Staff of the Air Force, General David Goldfein (GOLD-feen), to our hearing to review the Air Force's budget request for fiscal year 2019.

REVOLUTIONARY CHANGES TO THE AIR FORCE

Last September, the Air Force celebrated its 70th birthday. It's quite a different place from those early years.

The Air Force has built on its flying mission and nuclear mission to incorporate new domains like space and cyber.

The challenge for the future is to maintain this evolution by figuring out how to harness emerging technologies such as autonomous aircraft, artificial intelligence, and directed energy weapons.

BUDGET INCREASES AND ACCOUNTABILITY

The Air Force also has far more resources than 70 years ago. This hearing examines the \$154 billion you have requested for 2019—a far cry from the \$4.573 billion approved by Congress in 1948.

Under the recent 2 year budget deal, the budget of the Air Force went up by 11 percent from 2017 to 2018, and by another 4 percent from 2018 to 2019.

Any organization with such a large influx of funding would struggle with these type of increases. But adding to the uncertainty is that in 2020, sequestration returns, and the defense budget is again at the mercy of contentious budget talks.

Secretary Wilson and General Goldfein, I would like to hear your plan for accountability over the increases Congress has already provided, and what plans you are making if they cannot be sustained.

CONCLUSION

Mr. Chairman, thank you for calling this important hearing, and I look forward to hearing from our witnesses.

Senator SHELBY. Madam Secretary, we welcome you to the committee today. Your written testimony will be made part of the record in its totality. You proceed as you wish.

SUMMARY STATEMENT OF THE HON. DR. HEATHER WILSON

Secretary WILSON. Thank you, Mr. Chairman and Ranking Member Durbin, thank you both, and thank you for putting my statement in the record. I would just highlight a few things in our opening statement.

The fiscal year 2019 budget for the Air Force is well aligned with the National Defense Strategy that was published in January, and it recognizes that we face a more competitive and dangerous international security environment than we have seen in decades. We have returned to an era of great power competition, and that great power competition is the central challenge to U.S. security and prosperity.

In the budget that we presented, there really are two bold moves and one continuing effort. The continuing effort is to restore the readiness of the Force so that we can win any fight anytime. The two bold moves have to do with, first, accelerating defendable space so we can deter and defend and prevail against anyone who seeks to deny our free use of space in crisis or conflict. There is an 18 percent increase in the Air Force budget from the last 5-year defense plan to this 5-year defense plan, particularly related to space.

The second bold move in this budget has to do with multidomain operations. And what do I mean by that? The National Defense Strategy guides us to reduce our spending on things that only work in uncontested air and space. A new version of JSTARS, the Boeing 707-sized airplane that flies over our Army and tells them what's in front of them on the ground can't get close enough on the first day of any fight, particularly against Russia. Russian and Chinese surface-to-air missiles have more range, and the plane would be shot down in that first day of conflict.

We had to find another way, and our budget gives us a path forward by proposing to fuse data from space, manned, unmanned platforms to be able to see in front of the Army on day one so that we can protect them on day one.

The question arises, Could we do both? Could we recapitalize JSTARS and also build an advanced battle management system that could operate in a contested environment? Yes, we could do

both, and it costs about \$7 billion more than what we have proposed in our budget.

As we move forward in finalizing this year's budget, I would ask for your thoughtful consideration of this particular issue, which is one of the ones that is important for the future of the Air Force and our national defense.

With that, I would like to turn to General Goldfein for a few comments.

STATEMENT OF GENERAL DAVID L. GOLDFEIN, CHIEF OF STAFF OF THE AIR FORCE

General GOLDFEIN. Thank you, Madam Secretary.

And good morning, Chairman Shelby, Vice Chairman Durbin, and distinguished members of the committee. It's an honor for Secretary Wilson and me to represent the 670,000 Airmen, Active Guard, Reserve, and civilians as we update you on the Air Force and our budget proposal for 2019.

And I want to begin by thanking this committee for its leadership in delivering a historic budget that will continue the rebuilding of the U.S. military as we return to an era of great power competition. And as Secretary Wilson correctly stated, this budget directly aligns with the National Defense Strategy, enabling combat-credible air and space power to deter our adversaries, and should deterrence fail, to win in the 21st century.

So as Airmen, we understand that we are first expected to defend the homeland and our allies with a safe, secure, and effective nuclear deterrent. And on our worst day as a Nation, it's our duty to get the President where he needs to be, when he needs to be there, and keep him connected to his leadership team and forces in the field.

We also understand that we are expected to own the high ground with air and space superiority, freedom to maneuver, and freedom from attack. And we're expected to project America's military power forward with our allies and partners as we bring global vigilance, global reach, and global power to the joint team.

And this historic budget continues the recovery that you set in motion in 2017. And let me just offer you a couple of examples of progress we're making.

In 2016, our pilots averaged just 17 hours of flying time per month. And we advanced that number to 19 hours per month in fiscal year 2018, and with this budget, we begin restoring pilot proficiency to 21 hours per month in fiscal year 2019. Pilots join to fly, and this budget gets them back in the air.

In 2016, we faced a shortage of over 4,000 maintainers. In 2018, we'll reduce that number to near zero. Now, 10 years of maintenance experience lost cannot be gained overnight, but this budget sets the foundation for a full recovery.

And with your continued support of this budget, for the first time in years we have a National Security Strategy, a National Defense Strategy, and a Nuclear Posture Review, and the resources required to support them, strategic alignment. Or said another way, has been argued so well by this committee, for the first time in years we have a strategy-driven budget versus a budget-driven

strategy. And on behalf of all of our Airmen, I can only say thank you.

But we also know that we only have visibility on this plan through 2019, and a return to the disastrous budget caps of BCA (Business Case Analysis) in 2020 would repeat the damage caused by the 2013 sequester, from which we, as an Air Force, are still recovering. And with your help, we can not only avoid a return to BCA, but we can continue building on our current momentum with on-time appropriations.

And finally, Secretary Wilson and I, we are acutely aware that every dollar we are given is a dollar that was earned by Americans, and it is our solemn obligation and our duty to remain good stewards of those dollars.

So thank you again for the opportunity to testify this morning on behalf of all Airmen who are standing the watch.

And we look forward to your questions.

[The statement follows:]

PREPARED STATEMENT OF HON. DR. HEATHER WILSON AND
GENERAL DAVID L. GOLDFEIN

STRATEGIC ENVIRONMENT

The United States now faces a more competitive and dangerous international security environment than we have seen in generations.

Great power competition has reemerged as the central challenge to U.S. prosperity and security. China is rapidly modernizing its military and seeks regional preeminence. Russia aims to restore its national prestige and has shown its willingness to use military force and coercion in Europe and the Middle East. North Korea uses the threat of nuclear weapons to secure the survival of the regime. Iran has been a source of instability in the Middle East through the sponsorship of terrorism and exploitation of internal conflict in the region. Violent extremist organizations rooted in the Middle East, North Africa, and South Asia create instability and threaten the U.S. homeland and our allies and partners.

With global trends and intensifying pressure from major challengers, our relative advantage in air and space is eroding in a number of critical areas. The projected mismatch between demand and available resources has widened. Any American weakness emboldens competitors to subvert the rules-based international order and challenge the alliance and partnership network that underpins it.

In accordance with the National Defense Strategy, the Air Force must build a more lethal and ready force, strengthen alliances and partnerships, and deliver greater, more affordable performance. The Air Force requires the right size and mix of agile capabilities to compete, deter, and win in this environment, brought to bear by Airmen steeped in the business of joint and combined warfare.

AIR AND SPACE POWER IN DEMAND

Air and space power is indispensable to every joint force operation. The Air Force's first responsibility is to integrate air and space capabilities across the domains—delivering unmatched global advantage as an equal member of the joint team. We must be ready to design and lead joint and combined operations in support of national objectives.

We have five core missions:

Air and Space Superiority . . . *freedom from attack and freedom to attack*. Air and space superiority gives our military and coalition forces the freedom to operate. Accelerating the campaign to defeat ISIS, Airmen conducted more than 172,000 sorties and 98,000 precision air strikes last year—over 70 percent of the total in the campaign—to support Iraqi and partner forces in Syria and Iraq. In the NATO-led mission in Afghanistan, the Air Force executed a sustained air interdiction campaign of over 4,000 sorties to support Afghan partners, targeting Taliban so-called safe zones, command and control nodes, illicit revenue-generating ventures, and logistical networks. In space, the Air Force operates 6 constellations and 12 satellite systems vital to national security that provide communications, command and control, missile warning, nuclear detonation detection, weather, and GPS for the world. In 2017, the Air Force supported 28 space launches from our facilities at Vanden-

berg and Cape Canaveral, a 40 percent increase from 2016. We are planning 45 launches in 2018, sending both national security payloads and an increasing number of commercial payloads into orbit.

Global Strike . . . *any target, any time*. Airmen maintain the continuous alert of our missile forces. Last year, Airmen conducted 16,425 intercontinental ballistic missile alert tours and 248 missile convoys across 3 missile wings and 5 States. Our bombers flew 580 missions in the Indo-Pacific, strengthening security and stability in the region and reassuring our partners. Reinforcing NATO's eastern flank, American bombers flew 70 assurance and deterrence missions.

Rapid Global Mobility . . . *delivery on demand*. In 2017, Airmen transported nearly 1 million personnel, the equivalent of moving the population of Montana, and delivered over 738 million pounds of warfighting equipment and humanitarian supplies, the weight of 82 U.S. Capitol Domes. Our tanker force extended joint power projection at intercontinental distances by passing more than 1 billion pounds of fuel in-flight, which could fill the Rose Bowl to the top, while aeromedical evacuation Airmen airlifted more than 5,000 patients to safety. Closer to home, Airmen delivered 13,600 short tons of relief supplies following the string of record-setting hurricanes, and helped combat multiple wild fires in the western United States.

Intelligence, Surveillance, and Reconnaissance (ISR) . . . *global eyes and ears on adversaries*. Last year, the Air Force was tasked with nearly 25,000 ISR missions, collected 340,000 hours of full motion video, and produced 2.55 million intelligence products—which averages almost 5 products every minute that close intelligence gaps and support target analysis and development. Persistent ISR closely tied to precision weapons from the ground and air has been a linchpin element in the destruction of ISIS.

Command and Control . . . *right info, right person, right time*. Last year, our E4-B National Airborne Operations Center—the survivable mobile command center—conducted 53 alert tours and provided travel support to the Secretary of Defense. Our E-8C Joint Surveillance Target Attack Radar System flew over 5,000 hours, enabling a range of support for Combatant Commanders from command and control in the ISIS campaign to the interdiction of over 12,500 kilograms of illicit drugs before they entered our Nation's borders. The E-3 Airborne Warning and Control System was integral to coordinating search and rescue efforts during the 2017 hurricane season.

Increasingly, we are conducting these missions with allies and partners. The Air Force engaged in more than 85 exercises with international partners last year, including five focused on high-end combat. We furthered the international role of the F-35, training with partners in both Europe and South Korea, and began delivery of F-35s to Israel, Norway, and Italy. We concluded 42 International Arms Cooperation agreements worth \$2.95 billion, including a cost-sharing agreement that launched the ninth Wideband Global SATCOM satellite which enables international partners access to shared high-capacity global communications. In 2017, Foreign Military Sales expanded nearly three-fold from the year prior to \$22.7 billion. These sales strengthen the United States' position as the security cooperation partner of choice, and expand interoperable airpower.

STRATEGIC DIRECTION

The Air Force budget request of \$156.3 billion for fiscal year 2019 builds on the progress made in 2018 to restore the readiness of the force, increase lethality, and cost-effectively modernize. Sustaining these efforts requires predictable budgets at the requested funding levels.

In alignment with the National Defense Strategy, this budget prioritizes long-term competition with China and Russia.

This budget moves the Air Force in the direction of multi-domain operations. Future wars will be won by those who observe, orient, decide, and act faster than adversaries in an integrated way across domains—land, sea, air, space, and cyberspace.

The squadron remains the foundational fighting unit of the Air Force. The Air Force currently has 301 front line operational squadrons¹ to execute our core missions, supported by squadrons that directly enable the fight and provide reachback capability. Based on the new National Security Strategy, National Defense Strategy, and Nuclear Posture Review, the Air Force is in the process of determining how

¹Fighters, bombers, airlift, intelligence/surveillance/reconnaissance, command and control, special operations, space, cyber, missile, and personnel recovery squadrons are counted here.

many squadrons we need to deliver the combat capability required to execute the new defense strategy.

CONTINUING EFFORTS

Some elements of this budget continue programs and strategies that are well established:

Readiness.—Restoring readiness to win any fight, any time remains a primary objective. The budget funds 1.5 million flying hours—1.2 million executable peacetime training flying hours and 300,000 flying hours supporting overseas contingency operations—at a cost of \$8.7 billion. We propose to buy 54,443 preferred munitions to reverse previous declining inventories at a cost of \$1.8 billion. This budget also funds training ranges, simulators, instructors, and key infrastructure required to improve the quality of our training in alignment with the National Defense Strategy prioritization of peer competition.

People.—The fiscal year 2019 budget proposal represents an increase in the size of the Air Force by 4,700 Airmen.² Our 5-year plan calls for achievable, steady growth to approximately 339,000 active duty Airmen while we simultaneously review existing manning across the active duty, guard, and reserve components. In addition, this budget submission funds important support to Airmen and families with a 2.6 percent military pay raise, increased housing and subsistence allowances, and family support programs. We will invest in purposeful development of Airmen to strengthen our joint warfighting excellence—integrating education, training, and experience for our leaders and teams.

Nuclear Deterrence.—Our budget proposal supports the Defense Department's principal priority to maintain a safe, secure, and effective nuclear deterrent that safeguards the homeland, assures allies, and deters adversaries. The budget improves our nuclear command, control, and communication systems as directed in the Nuclear Posture Review. It initiates development of B-52 replacement engines, continues development of the Long Range Stand Off missile, and continues development of the replacement for the Minuteman III intercontinental ballistic missile.

Modernization. The budget funds our priority modernization initiatives with the purchase of 48 F-35 fighters, 15 KC-46 tankers, and continued development of the B-21 bomber. This year, we will decide the new T-X advanced trainer aircraft and the replacement for the UH-1 helicopter. Critical to mission success is continued investment in our classified portfolio, which will be briefed in a closed session.

CHANGES TO IMPLEMENT NATIONAL DEFENSE STRATEGY

Some elements of this budget reflect a change to confront the reemergence of great power competition:

Space Superiority.—The fiscal year 2019 budget represents a 33 percent increase from last year in the research, development, test, and experimentation budget for Air Force Space to meet the threat from China and Russia. We will build more jam-resistant GPS satellites, improve missile warning, improve space situational awareness, and increase our ability to defend our Nation's most vital assets on orbit. We are taking advantage of changes in legislative authorities to return program decision authorities back to the Air Force, including 14 of the 19 Major Defense Acquisition Programs within the space portfolio. Using tools such as the Defense Acquisition Workforce Development Fund, we are investing in our people, ensuring they have the right skills and training to succeed.

Multi-Domain Command and Control.—Technological advances are changing the character of warfare. The budget proposes to change the way we execute battlefield management command and control in the multi-domain environment. We propose to modernize 7 E-3 Airborne Warning and Control aircraft (AWACS) and keep the current E-8C Joint Surveillance Target Attack Radar System (JSTARS) operational through the mid-2020s, as we develop and transition to an advanced battle management system. This approach will integrate space, air, and ground based sensors on manned and unmanned platforms and satellites to meet more combatant commander requirements in both contested and non-contested environments.

Air Superiority.—Central to lethality is our ability to gain and maintain air superiority when and where needed against potential adversaries in 2030 and beyond. Over the next 5 years, we will develop an integrated family of systems that can establish and maintain air superiority in a contested environment. The fiscal year 2019 budget includes \$11.0 billion as part of a \$63.8 billion effort over the 5-year plan. This will be a multi-domain effort with a renewed emphasis on electronic warfare, networked capabilities, and control of the electromagnetic spectrum.

²Total Force number including active duty, guard, and reserve.

Light Attack.—Retaining irregular warfare as a core competency at a lower cost, and strengthening our alliances are key elements of our National Defense Strategy. The Air Force proposes to continue the light attack experiment, developing concepts of operation and further defining requirements in preparation for fielding a force of U.S. light attack aircraft during this 5-year plan. We are focusing on rapid fielding and rapid procurement strategies that leverage existing capabilities with little or no development. Designed to be coalition at the core, we will invite and lead allies and partners to train in the U.S., buy common equipment for their own affordable light attack squadrons, and build those international squadrons on a network that shares information.

Science and Technology.—The Air Force launched a review of our science and technology strategy that will be complete later this year. This budget increases emphasis on basic and applied research to drive long-term innovation and dominance in air and space power.

BUDGET PRIORITIES

Improving Warfighting Readiness.—Readiness is first and foremost about having enough trained people. We continue to address the aircrew shortage through a multi-pronged approach. This budget boosts pipeline capacity, expands pilot training and addresses experience shortfalls, continues incentive pay and bonuses, improves administrative support at the squadron level, and funds flying hours to executable levels. It also addresses gaps in space, nuclear, cyber, and intelligence career fields, and supports Battlefield Airmen, our air-to-ground integration force.

The budget proposal funds aircraft depot maintenance, parts, logistics support, and invests \$2.8 billion in operational training infrastructure needed for relevant, realistic training for the multi-domain environment. It fully funds preferred munitions to industry capacity. This includes Hellfire missiles, Joint Direct Attack Munition bombs, the Small Diameter Bomb, and the Advanced Precision Kill Weapon System.

The Air Force recruits Airmen, but we retain families. To improve family support, the budget funds expanded childcare hours, increases off-base child care support, and funds more respite care and support coordinators for special needs families. We are improving the assignment system so families can better plan for future assignments, sustaining our morale and resilience programs, and implementing initiatives that support unit cohesion in our squadrons.

The Air Force is also significantly changing the way we collect operational tempo metrics. Prior methods underreport how much time Airmen are away. By now accounting for temporary duties away from home station for training exercises or mission-related requirements in addition to deployment time, we more accurately capture the true impact of service demands on Airmen, families, and home units.

Safe, Secure, and Effective Nuclear Deterrent.—Deterrence works if our adversaries know that we can hold at risk things they value. We must concurrently modernize the entire nuclear triad and the command and control systems that enable its effectiveness. The Air Force stewards two legs of the triad and operates 75 percent of the Defense Department's nuclear command, control, and communication (NC3) capabilities.

Modernizing the air-based leg of the nuclear triad, the budget continues development of the replacement air-launched cruise missile, which is 25 years past its design life and faces improving adversary air defense systems. This weapon will equip the B-52, B-2, and forthcoming B-21 bombers to maintain flexible and effective stand-off capability that can penetrate and survive the most challenging environments.

This budget continues to update the B-52 bomber fleet and funds development of replacement engines. With adequate sustainment and modernization, including new engines, the B-52 will remain a key part of the bomber enterprise well into the future. Additionally, the budget proposal begins to replace our Vietnam-era UH-1N helicopter.

The budget moves forward modernization of the ground-based leg of the nuclear triad. The Ground-Based Strategic Deterrent program will replace the retiring Minuteman III, which has remained viable four decades past its design life through a series of costly service life extensions, but cannot be extended further beyond 2030.

Today's nuclear command, control, and communications system was last comprehensively updated almost three decades ago. The budget targets investments to modernize the integrated land, air, and space-based systems to ensure secure, survivable connectivity with the President and national command leadership.

Cost-Effective Modernization.—Underfunded in modernization for over a decade, the Air Force must manage a bow wave in modernization over the next 10 years.

The budget proposes to upgrade F-16 and F-15 C/D aircraft to retain affordable capacity. We propose to buy 48 F-35A aircraft in fiscal year 2019 and 258 F-35A aircraft over the next 5 years. The F-35A fighter brings unparalleled global precision attack capability. The Air Force will integrate the F-35 with fourth-generation aircraft as well as space and unmanned aircraft, to maintain air superiority in highly contested environments.

Tanker recapitalization remains a top acquisition priority. The multi-role KC-46 is capable of refueling joint and coalition aircraft with both boom and drogue in the same sortie, and augments the airlift fleet with improved cargo, passenger, and aeromedical evacuation capabilities. This budget proposes to buy 15 more KC-46 tankers in fiscal year 2019.

Our budget proposal continues to develop the B-21 bomber as a key component to the joint portfolio of conventional and nuclear deep-strike capabilities. The B-21 will be able to deliver both gravity bombs and the Long Range Stand Off missile, ensuring options for our Nation's leaders to hold targets at risk around the world.

Moving Faster To Defendable Space.—The fiscal year 2019 budget accelerates our efforts to deter, defend, and prevail against anyone who seeks to deny our ability to freely operate in space. The budget recognizes that adversaries are developing the ability to deny our free use of space and includes capabilities to confront that threat. The development of these capabilities will continue over the future years defense plan and beyond.

Foregoing the continued buy of today's Space Based Infrared System satellites 7 and 8, the Air Force will develop the next-generation Overhead Persistent Infrared system. This system will detect and report on current, emerging, and anticipated threats, and will be designed for survivability.

The budget adds resilience features and user protection to the Advanced Extremely High Frequency and Wideband Global Satellite Communications systems, and continues to fund development of next-generation protected satellite communications services for both strategic and operational military users. We continue to explore more affordable and innovative ways to acquire satellite communications services with investment in both commercial industry and international partner capabilities.

The budget proposal increases funding for anti-jam, anti-spoof, and anti-tamper military GPS development and integration into multiple joint platforms, and continues to grow Space Situational Awareness and Space Control capabilities to enhance our ability to identify, characterize, and attribute threatening actions. The budget also funds a Weather Satellite Follow-on program using rapid acquisition authorities.

Building upon the foundational architecture for space warfighting, we will deliver highly responsive capabilities to connect tactical and operational systems to strategic-level decision makers. The recent stand-up of the National Space Defense Center supports this mission. The budget also funds the Standard Space Trainer that provides realistic, live, virtual, constructive training to prepare our Space Mission Force Airmen to prevail in a contested space domain.

Networked Battle Management.—Integrating capabilities that span all domains of warfare will be required for success in future combat. With the other Services, we are shifting from a model of interdependence to one of integration, which includes better integrated communications systems, development of tailorable units, and policies in key areas that enable adaptability and innovation. Concurrently, we will advance our command and control systems to reflect the changing character of warfare.

The Air Force capability that delivers persistent battle management command and control and ground moving target indications to joint warfighters is in high global demand that far exceeds supply. We currently conduct battlefield command and control from JSTARS, AWACS, Combined Air Operations Centers, Tactical Operations Centers, and mobile Control and Reporting Centers, and monitor many targets on the ground from JSTARS, Global Hawk, and other unmanned aerial systems. We had planned to recapitalize our aging fleet of E-8C JSTARS on a newer aircraft, however, we believe that system will not be viable in future contested environments and the recapitalization plan brought no additional capability or capacity to meet future demands despite over \$15 billion in total lifecycle costs. In developing an alternative approach that will meet more warfighter needs, we propose to keep the current E-8C JSTARS operational through mid-2020s and replace the recapitalization program as we transition to an advanced battle management system for the future. This approach, as directed in the National Defense Strategy, will network sensors from space, air, land, and sea, and fuse information to create a more comprehensive picture to support the joint fight, even in a contested environment.

Strengthening Alliances.—The National Defense Strategy emphasizes the importance of alliances and partnerships. The fiscal year 2019 budget reinforces the Air Force commitment to our allies and international partners through programs such as the European Deterrence Initiative and Indo-Pacific security initiatives.

REFORMING THE DEPARTMENT

While this budget proposes additional resources for the Air Force, we have to gain full value from every taxpayer dollar we spend. We will drive innovation, reinforce budget discipline and affordability, and deliver performance with the funds entrusted to us.

Zero-Based Review.—For the first time in more than two decades, we are conducting a zero-based review of all Air Force programs, budget accounts, and manpower authorizations to prepare for fiscal year 2020 and the future years defense plan. We will examine the relevance of every requirement and program to align with the new defense strategy. Everything we do is “on the table” during this review.

Headquarters Air Force Staff Review.—Simultaneously, we are reviewing the structure and manning of the Headquarters Air Force staff. We are the smallest and most integrated of the service staffs and intend to stay that way. We will ensure each position is used efficiently and effectively to support the warfighter.

Acquisition.—Enabled by the fiscal year 2016 and fiscal year 2017 National Defense Authorization Acts, we are streamlining Air Force acquisition. We have milestone decision authority for more programs and we are pushing authority to run programs down to lower levels and using new techniques to innovate, including rapid prototyping and experimentation. We appreciate Congress’ continued support of the Acquisition Workforce Development fund and expedited hiring authorities to attract, recruit, hire, develop, and retain a high-quality workforce.

Streamlining.—We are systematically reviewing, reducing, and clarifying onerous internal instructions, additional duties, and computer-based training. There are over 1,300 Air Force instructions that levy 85,000 requirements on our wings and squadrons. Every one of them will be reviewed, rescinded, or rewritten over a 24 month period. We will significantly reduce the number of Air Force publications and ensure the remaining ones are concise, current, and relevant. We have already rescinded over 100 Air Force Instructions. While this review reduces stifling bureaucracy and associated cost, the more important impact is on our ability to fight. This supports the culture of centralized intent and decentralized execution we need for competent and entrusted Airmen to make decisions in future highly contested environments, where we cannot expect continuous centralized control.

Air Force Warfighting Integration Capability (AFWIC).—The Air Force is implementing changes to program development that will better integrate the budget across the force and allow for more rapid change to meet emerging threats. This will improve force design analysis to support national defense priorities and improve our ability to engage in multi-domain operations.

Revitalizing Squadrons.—Squadrons are the warfighting core of our Air Force. We organize, train, and equip to deploy from the squadron up. By revitalizing our squadrons, we are reinforcing cohesive, ready, and agile fighting forces to defend our Nation’s interests in the complex security environment. We depend on exceptional leaders to lead the world’s most powerful Air Force and joint teams. We will develop future leaders, address cultural shifts to embrace 21st century talent management, and unlock the true potential of our Airmen.

HYPERSONIC WEAPON DEVELOPMENT

Senator SHELBY. General, I’ll direct the first question to you. We understand that it’s difficult to talk about the subject I’m getting into, hypersonic weapons, in this setting, which you can a little maybe. But since press has reported on the development of hypersonic weapons by China and Russia, could you describe as much as you could here our efforts to develop and prototype these weapons and how important it is?

General GOLDFEIN. Yes, sir, and I’ll tell you that—and I’ll begin with a couple of the programs that we’re looking at and then perhaps turn it over to Secretary Wilson on what the Department is doing overall because it’s broader than an Air Force effort. This is

across the Department of Defense. Secretary Mattis has made it a priority.

Within the Air Force, what you will see is a significant investment in hypersonic technology, two particular programs that we're looking at that can advance. And I'm proud to say that in both of these programs we are working in close partnership with the Navy and the Army to look for smart commonality as we go forward that not only brings the best technology to bear, but also saves costs in the meantime.

Secretary WILSON. Mr. Chairman, in this 5-year defense plan, there are \$524 million that are devoted to hypersonics. We just signed an agreement with Lockheed Martin Corporation for a prototyping effort. It's an accelerated procurement, and using the authorities that you have given us to try to go faster, but it's also a joint work with the Army and the Navy. We're going to—we decided to—we all got together and said, "Let's use the best technology that we have." It happens to be an Army-tested warhead that they had intended for the Navy. The Navy would have to take a few years to scope down its diameter, but we don't have to. So we're going to put an Army front end on an Air Force booster and test it off an Air Force aircraft and develop an accelerated program using the prototyping authorities that you've given us.

IMPORTANCE OF HYPERSONIC PROGRAMS

Senator SHELBY. How important is this program to us in the future?

Secretary WILSON. Senator, this is a very important capability, to be able to threaten targets from a long way away at very high speed.

MAINTAINING NECESSARY MUNITIONS

Senator SHELBY. Secretary Wilson—

I've got this on now. Thank you, Senator Durbin.

The Air Force continues to expend large numbers of munitions in support of operations around the globe. Does the 2019 request provide adequate inventory levels of your most important munitions? Because you've got to have the munitions, haven't you?

Secretary WILSON. Yes, sir. Sir, one of the things that was clear to me when I took this job a year ago was that one of the ways they had managed a declining budget was to let the stocks of munitions go down. This budget increases munitions purchases to about 54,000 items next year, and is purchasing what we call preferred munitions at the maximum industrial capacity, so 100 percent of industrial capacity, to turn the corner.

We are currently working in the Defense Department, DoD-wide, on our next budget plan to look at, "How do we completely recover? What are requirements for munitions?" so that we have what we need to support the National Defense Strategy.

Senator SHELBY. Madam Secretary, you know a lot about this. Congress has consistently supported funding to rapidly transition from our current dependence on the Russian-made RD-180 rocket engine for national security space launches while maintaining assured access to space as a matter of U.S. policy.

Currently, is the Air Force on track to successfully transition off the RD-180 rocket engine by the end of 2022?

Secretary WILSON. Yes, sir, we are.

Senator SHELBY. So you feel good about that.

Secretary WILSON. Yes, sir, I do.

Senator SHELBY. Thank you.

CHALLENGES IN RETAINING DEVELOPING RECRUITS

My last question has to do with personnel. The U.S. Air Force consistently recruits and trains some of the best and brightest people in our country, and I know you have a particular interest in this aspect of your job given your extensive background in education. Madam Secretary, what are some of your biggest challenges in retaining and developing the men and women that enter the Air Force, and what are you doing to develop space operators and to address the current shortage of pilots?

Secretary WILSON. Sir, I'll take the first part of that on space operators, and maybe General Goldfein can handle with respect to our aircrew.

For space, we have about 4,000 people in our space operations career field. We have some additional folks who are part of acquisition and engineering. About a month ago or so or within the last month, we directed a complete review being led by the Commander of Air Force Space Command, but also involving the National Reconnaissance Office, our personnel shop, and so forth, to look at the career progression for space operators so that we have a healthy career progression for anyone in that realm, because it's a fairly small career field, and you want to make sure that you really can come into space operations and have opportunities all along the way for professional development and develop into a senior officer or a senior NCO (Non-Commissioned Officer). That work should be done in 60 days, and they will come to us with recommendations for any changes that need to be made on how we manage the Force.

Senator SHELBY. General, do you have a comment?

General GOLDFEIN. Yes, sir. So, first, we acknowledge that this is a national level challenge, and the problem statement, as we have analyzed it, is that the Nation today doesn't produce enough pilots to adequately service commercial business and military aviation. And a variety of factors are causing airlines now to require 4,500 pilots a year for the next 10 years.

So we're working with industry and we're working with Congress on some of the national-level issues and incentives to produce more pilots for the Nation. Now, within—what we're doing in the United States Air Force, it's a combination really of production and retention. How do we produce the number we need over time, park that throttle, and continue to produce the numbers we need with expected attrition? Because as long as the airlines are going to continue to hire, we're going to have folks who are going to continue to depart. But then also, how do we retain that talent within the Air Force?

In 2017, we took a number of actions. We increased the number of pilots that were produced by about 70. We started solving the maintenance manpower that I mentioned earlier. We looked very

heavily at downrange deployments and really cut those down to really refine what we're using them for. And then with Congress' help, we changed the aviation bonus for the first time in years. In 2018, we added even more pilots, and we continued that recovery.

We have about 69 initiatives right now that we're working with the Force that are retention initiatives that are looking at talent management. How do we manage this talent? How do we work with them individually to be able to incentivize their reason for staying, which at the end of the day is about quality of service?

Senator SHELBY. If you don't do that, you're going to have a brain drain, aren't you?

General GOLDFEIN. Yes, sir. That's why we're—there's no idea off the table.

Senator SHELBY. Thank you.

Senator Durbin.

Senator DURBIN. I want to stick with that question.

Thank you both for being here and for meeting with me in my office ahead of time.

PILOT SHORTFALLS

Let's stick with the question of the pilots. I understand the Air Force pilot shortfall has climbed from 1,500 to 2,000 in the last year. Is that correct?

[No audible response.]

Senator DURBIN. And you have spoken about the things that we are doing for retention and training production of new pilots. The authorization bill allows a \$35,000 annual bonus to attract pilots. Is it enough?

General GOLDFEIN. It is for now. I will tell you, sir that we will likely come back. We are doing our analysis right now because, you know, we just put that into place, and we're looking at the analysis right now. And it's as much not only how many have taken it, but talking to individual pilots and seeing what the incentive plan needs to look like. So we may be coming back to you for a change of that, but not for this particular budget year.

Senator DURBIN. How about work-life balance? What are you doing in that category when it comes to pilot shortfall?

General GOLDFEIN. Yes, sir, a number of things. First, we have already reduced the number of downrange deployments by over 140 positions at the headquarters at Al Udeid. We're looking at every one of the requirements that we—where we place pilots to make sure that a pilot is required. We're looking at every one of our exercises, not only within the Air Force, but jointly to make sure that those exercises are—the return on investment is worth it because much of the balancing of—and this is not only pilots, this is aircrew, this is maintainers, this is across the smaller Air Force that's engaged globally, this is about the number of—you know, the number of days when those folks are actually home with their family and can balance their home life with their work life, and so we've got a number of incentives that we're looking at in that regard.

"HUMAN WEAPON SYSTEM" FUNDING

Senator DURBIN. I also—I've got to give credit to whoever came up with the term, decided to describe pilots a "human weapon sys-

tems.” There’s an allocation of \$13 million for optimizing the human weapon system, and it includes a contractor, a physical therapist, or athletic trainer for every 30 fighter aircrew to provide preventive and rehabilitative musculoskeletal care for intense neck and spinal strains. Would you explain that?

General GOLDFEIN. Yes, sir.

So maybe I’ll start, ma’am, and if you want to jump in. You know, so we always have a joke that—you know, I grew up flying F-16s, right? So you sit 30 degrees back, you pull nine times your body weight, nine Gs, and then you want to know if anybody is behind you. So while you’re pulling nine Gs, you are turning to look back behind you. So if you can imagine physically what that does to the body over time.

Senator DURBIN. I can’t, but I trust your judgment.

General GOLDFEIN. So we always joke that says if you ever want to know if a guy is an F-16 driver, it’s easy, just call his name, and if he turns like this—right—you know you’ve got the right guy.

[Laughter.]

General GOLDFEIN. So what we’re doing is looking at, what is the physiology? And one of the areas that we’re really focused in is, what is the physiology for both men and women, and do we have this right? Now that women are in every—you know, in every combat position that we have in the Air Force, we have women serving, do we have it right for the entire Force? So we’re doing a lot of work on this, and we appreciate the appropriations to allow us to do that.

Secretary WILSON. Senator, I would just add I was down with the Special Operations Forces at Hurlburt Field and Eglin last week, and this idea of embedding physical trainers comes from our Special Operations Forces, where it’s been very successful. And Special Ops has a lot of physical strain in those fields, but they’re also very reluctant to go to the doc because if they go to the doc, they’re afraid they’ll be pulled off the team.

And I was talking to one special operator, and he said that as a young person in Special Ops, he always had lower back problems, but he never would go to the doc about it, you just grin and bear it until you just can’t stand it anymore. He—they now have a physical trainer and basically kind of an athletic coach who works out with them, and there’s an intense physical workout profile for these folks. And he taught him how to work out better so that he strengthened the muscles in his back. He has no problems anymore, but he never would have gone to the doc. And it was just one vignette. But we think this treating our high-performing people, like high-performing athletes, keeps them longer and means less strain and wear and tear.

CHALLENGE REGARDING PERSONNEL

Senator DURBIN. It makes sense. After pilots, what will be the next critical personnel category where you’re facing challenges?

Secretary WILSON. Senator, we have a couple of others. One is a group we call battlefield Airmen, so it’s joint—our tactical—joint tactical operations officers, our PJs and so forth.

Senator DURBIN. What’s a PJ?

Secretary WILSON. Pararescue jumpers. They are—think combat trauma and fighting your way in to get them. So they go in to recover downed pilots. They're some of our most highly decorated Airmen. It is hard to recruit in that field, and we stood up this year a special recruiting element that specifically focuses on those special operators. The others, of course, things like cyber, are not so much hard to recruit, but certainly hard to retain because their skills are in such high demand.

MONETARY COMPENSATION

Senator DURBIN. Do you foresee the need for bonuses or incentives to attract and keep those specialties?

Secretary WILSON. Senator, not necessarily at this point. Overall, we're meeting our recruiting goals, and our end-strength goals there, but if we do need those authorities, we will certainly come to you. The one thing we did do this year was start a direct commissioning program for cyber officers where they come in, given 3 years of credit for service.

Senator DURBIN. We would like to work with you on that. I think you're identifying specialties that are needed in many different areas, and as with pilots, you're in competition with the private sector.

Secretary WILSON. Yes, sir.

Senator DURBIN. And compensation levels and treatment and lifestyle levels have a lot to do, I'm sure, with the decisions that are being made.

Mr. Chairman, I want to apologize to the witnesses as well as the rest of the committee.

But we have a new chairman of the Senate Appropriations Committee, and he has really put us on a tough schedule. Would you believe that at 10:00 we have three different Appropriations subcommittees that are having hearings at this very time, while the Senate Judiciary Committee has a markup? And because of this new chairman and the driving force he's become in the United States Senate, I may have to leave a little early. But thank you for your testimony.

Senator SHELBY. Thank you, Senator Durbin.

Senator Collins.

Senator COLLINS. Thank you very much, Mr. Chairman. And I would second the comments made by our ranking member.

Secretary Wilson, let me begin by congratulating you for completing your first year as our Secretary of the Air Force. You've done a remarkable job, and I wish you well as you continue your service to our country.

Secretary WILSON. Thank you.

UPDATE ON CHINESE/RUSSIAN AIRCRAFT

Senator COLLINS. To the extent that it is possible in this open session, could you or the general provide the committee, the subcommittee, with an update on where we believe that Russia and China are with their fifth-generation aircraft production? You mentioned great power competition has reemerged as a major challenge to our national security. So my question would be, where are Russia and China on their fifth-generation aircraft production? And

second, how does the F-35 fifth-generation capabilities contributing to ensuring U.S. air dominance?

General GOLDFEIN. Thank you, ma'am. We're watching, as you might imagine, Russian and Chinese production very closely, and so we are seeing them moving into the fifth—what we call fifth generation, which we define as a combination really of stealth technology, but also equally important is the ability to fuse information from sensors that are not only on the aircraft, but from a variety of domains and other capabilities. And that will be important when I talk about the F-35 and what the F-35 brings.

So in terms of Russia and China's capabilities today, we enjoy an advantage, but we're watching closely how they're investing and taking away that advantage. And so one of the things you'll see in this budget is that we're putting investment towards the research and development now for actually what comes after the F-35 to ensure that we maintain that advantage going forward into the future. How do we keep the F-35 and the fifth-generation fusion capability more viable longer? And how do we ensure that we always maintain that advantage? Because we really—you know, we go back to that day when Iraq decided to bury their aircraft in the sand versus face air power, we want each nation to have that same calculus.

The F-35 has brought game-changing information fusion to the battlespace that we have not enjoyed before. And just to put it in perspective for you, so I went out to a Red Flag and I was watching actually a young Marine in his mission commander check ride in the F-35B in its debut, and we put it up against the worst threat array that we could find both on the ground and in the air. Before he climbed up into the airplane as it was getting powered up, there was already being information fused into that cockpit and onto his displays on what was going on in the cyber domain because the cyber campaign was a part of his overall mission that he had built. Before he got to the tanker, he was getting information fused into his cockpit on what was going on in the space domain because we had space operations.

I will tell you as a guy who flew fourth generation, there was no way I ever had that kind of a display. And what he was able to do with that information was become the quarterback of the entire team. And he was calling audibles against the threat based on what he was being fed in the cockpit, and that fusion is an absolute game-changer. And I will just highlight that I talked this week to the Israeli Air Chief, and the F-35 has become an operational game-changer, not only for us, but for our allies and partners.

Senator COLLINS. Thank you. I think that last point is so important, that it just—that the partnership we have with other countries—Israel, the U.K., South Korea, and others—is really important as we continue to support production of the F-35.

Secretary Wilson, when we were in our office, but I'm going to bring it up again here, too, I mentioned that the Air Refueling Wing in Bangor, Maine, which is known as the "Maniacs," and you will find the Maniac stickers in the most amazing places around the world, has long been a workhorse unit for the Air Force, supporting more than 1,000 transient aircraft annually, and deploying personnel at very high rates. In recent years, the Wing has proc-

essed twice as many gallons of fuel as the average Air National Guard Refueling Wing, which illustrates the remarkable workload and efficiency of this Wing, as well as its strategic location.

WING CHALLENGES

One of the persistent challenges for the Wing is maintaining this high-op tempo has been the absence of a flight simulator because this means that members of the Wing have to travel out of state for simulator training, and that further strains available operational and training time. Would you commit to taking a look at this issue to see whether it might be possible to get a simulator for the Wing given its enormous contributions to the Air Force?

Secretary WILSON. Senator, we will take a look at it. There are five simulators for the KC-135 that have become available because of the consolidation of the KC-135s in anticipation of the KC-46s coming into the inventory, at least we're planning for that. Of those five, we've already figured out where three of them are going. The commander of Air Mobility Command is looking at the other two locations for where the remaining two simulators should go, and it will be entirely based on what he calls a business case analysis.

So where do we put it? Because somebody is going to have to travel. Where do you put it to minimize the travel time and travel costs for the aircrew that are going to have to use them? But we've got two more to do, and he will make that decision based on the best interest of the Force as a whole.

Senator COLLINS. Thank you.

Thank you, Mr. Chair.

Senator SHELBY. Senator Leahy.

Senator LEAHY. Thank you, Mr. Chairman. I want to—you know, I am glad to see the—and I know Senator Durbin is, too—see the Senate Appropriations Committee going back to the old way of actually getting things scheduled and done.

And Secretary Wilson and General Goldfein, I'm glad to see you both again.

We don't have "Maniacs," but I'll talk about the Green Mountain Boys. You know, Madam Secretary, we are proud, as I've told you many times, of our Air National Guard. They do make a lot of sacrifices to serve our Nation. It's one of the finest units in the total Air Force. And after an extensive and competitive review, they were—the Air Force selected the Vermont Air Guard to be the first Guard unit to operate the F-35A, and they'll operate out of Burlington, Vermont.

QUESTIONS REGARDING VERMONT AIR GUARD

And one thing I've always been proud of from the time I was a college student there is watching how the Guard has worked with the community to integrate what they do, and they'll continue to do it. I am concerned that a group has circulated some misinformation in Vermont, so let me ask a couple questions just to clarify the public record. Is it not correct that the Air Force selected the Vermont Air National Guard for basing the first F-35As after the Air Forces' own extensive basing evaluation process?

Secretary WILSON. Sir, that's correct. It's the third unit to get the F-35 and the first National Guard Unit after a national look and a narrowing down of appropriate bases for them.

Senator LEAHY. Thank you. And the Vermont Air Guard currently flies F-16s. General, I've flown in a couple of the rare two-seaters of the F-16s. I know exactly what you're saying about trying to turn around. It's known for its excellent maintenance and operation records, but they're nearing the end of their service life. And some have claimed that, well, they go—there will be another mission for the Vermont Air Guard other than F-35 basing. That's not a fact, is it?

Secretary WILSON. No, sir, it's not. In fact, the United States Air Force has gone—since 1991, we've gone from 134 fighter squadrons down to only 56. And as Senator Udall knows all too well, there are now States that do not have flying missions. If there is—if the F-35s don't go to Vermont, the F-16s would eventually age out, and it's highly likely that Vermont would no longer have a flying mission for its Guard.

Senator LEAHY. All right. Thank you, Madam Secretary. And I want you to know how proud I am of both the Air and Army Guard in Vermont. They've always responded.

PRODUCTIVELY FAIL

I want to ask you something, and we discussed about this yesterday, and I was intrigued by your answer. In your recent Air Warfare Symposium speech, you said it's time to take risks, it is time to productively fail. I found that intriguing. Would you speak to that a little bit?

Secretary WILSON. Senator, when I say “productively fail,” I used to be the president of a science and engineering university, and I found that our freshmen students, you know, A and B students, out of high school, really hard working, they're always afraid to fail. And as engineers, they need to learn how to productively fail. And so I would give them examples.

And you know, for example, you know why WD-40 is called WD-40? Because the first 39 versions didn't work. And so it's about finding what doesn't work sometimes. You think about WD-40, four out of every five homes in America have a can of WD-40, and it was initially developed as a coating for the Atlas missile to prevent corrosion. But it took a guy named Norm Larsen 40 tries to get the right formula to make it work.

And so it's about learning as you prototype an experiment and not thinking of a test failure as a failure; it's just one more step where you're learning to figure out the path towards success. And so that's what I mean by “productive failure.”

Senator LEAHY. I was intrigued by it. I went back and reread last night your speech, and I think we could put that in a whole lot of areas, but, obviously, you're being cutting edge in the Air Force, you're going to have things that don't work the first time, and you've got to be willing to go ahead with it.

PRODUCTION OF HH-60W

And I'm glad to see you include funding in the fiscal year 2019 budget request for initial production of the HH-60W, the combat

rescue helicopter, something I supported early on. Can you explain to the committee the need for this, either you or General Goldfein, whoever you'd like, and how that might be used in combat missions?

General GOLDFEIN. Yes, sir. As an Air Force, we actually own the mission to be able to fight our way into a hot landing zone, fight our way in against an enemy, and pick up a wounded soldier, so an Airman, Marine, at the point of injury. And so the combat rescue helicopter allows us to do that mission. And not only is it for us, but it's also for our allies and partners because they know, and we've demonstrated this to them before, that if they go in and they find themselves on the ground, you know, out of an airplane that they bailed out of, that we're not going to stop at anything to come get them. And I have personal experience with that, having been rescued myself back in 1999, and I'll tell you, one of the best sights you'll ever see when you're behind enemy lines is that combat rescue helicopter on its way to pick you up.

Senator LEAHY. The head of my Vermont office was in the Army during Vietnam, and he tells about when they crashed behind enemy lines and were surrounded in the jungles by the enemy, how good it felt when that rescue came in.

So, Mr. Chairman, thank you very much.

Madam Secretary, thank you. And again, I was intrigued by that speech, and I hope a lot of people read it.

And General, I appreciate your comments, too.

Senator SHELBY. Thank you, Senator Leahy.

Senator Hoeven.

Senator HOEVEN. Thank you, Mr. Chairman.

And Secretary and General, thanks to both of you for being here and for the tremendous job that you do. We appreciate it very much.

UPL JUSTIFICATION FOR GBSD AND LRSO

Secretary Wilson, you submitted a short list of so-called unfunded requirements, which are programs where you would spend money if it were available beyond the basic budget request for fiscal year 2019. That unfunded requirement list included a request of an additional \$69 million for the Ground-Based Strategic Deterrent program, which will replace the Minuteman III ballistic missile, and an additional \$85 million for the LRSO (Long Range Stand Off), which will replace the existing nuclear cruise missile ALCM (Air-Launched Cruise Missile). These are important parts of the nuclear modernization program. So can you address the status of these programs and why they could use additional funds, please?

Secretary WILSON. Senator, as you know, we are required to put in a list of unfunded requirements, which the Chief develops. Our list this year is far smaller than it has been in the past because the increased commitment in the top line of the budget allows us to fund more of the things that we need to fund.

What our unfunded requirements list did this year was accelerate the things that are already in our 5-year plan. If we had more funds, we would do this more quickly.

With respect to those two programs that you mentioned, the Ground-Based Strategic Deterrent is on schedule; in fact, it's actu-

ally a little ahead of schedule, and we may be coming to you with a reprogramming request this year just to continue on and keep ahead of schedule. The Long-Range Stand-Off missile is also on schedule. But we're—in both of those programs, we're very early in the program, but they are going well so far.

Senator HOEVEN. General, did you have any thoughts on that as well?

General GOLDFEIN. Sir, the exact same point really, that, first of all, they're fully funded, and second point, if there were additional funds, we would move aspects of those to the left because it is a critical capability, and we need to do it as quickly as we can.

RQ-4 GLOBAL HAWK DEMAND

Senator HOEVEN. General, if you would talk about the demand for the RQ-4 Global Hawk. And also I understand you're—the Air Force is rethinking the way it integrates data from a variety of platforms to get a clear picture of the battlefield. So what role do you see Global Hawk playing in the coming years? And do you expect—still expect it to be in high demand for commanders in various areas of operation around the world?

General GOLDFEIN. Yes, sir. Global Hawk is one of our most in-demand assets for combatant commanders. And so today, you know, we've invested a significant amount, and an ISR (Intelligence, Surveillance, and Reconnaissance) enterprise is rather exquisite and provides situational awareness for not only military, but for civilian leadership that is almost unprecedented. And one of the central players in that enterprise is Global Hawk because we can fly it for long periods of time, it has exquisite sensors and capabilities. So I see the demand signal for that capability going up and up in the future.

Senator HOEVEN. Secretary.

IMPROVEMENTS TO ACQUISITION PROCESS

Secretary WILSON. Sir, nothing in addition to that.

Senator HOEVEN. Okay. And then also, Secretary, can you provide the committee with an update on what the Air Force has been able to do since acquisition authorities have been delegated from the Office of the Secretary of Defense to the military services, and whether you see a need for any additional authorities to improve the acquisition process?

Secretary WILSON. Senator, in each of the last three defense authorization acts, there were acquisition reforms. And the Congress moved a lot of acquisition authorities back from—from OSD (Office of the Secretary of Defense) down to the services. We are now managing those programs, and we have pushed all of the authorities down to program managers so they spend more time managing their programs and less time managing the Pentagon.

We are also taking advantage of new authorities that you've given us for prototyping and experimentation. Over the last couple of months, the Air Force has accelerated eight large programs using these new authorities which you've given us, including the next-generation missile warning satellites, new engines for the B-52, which we will use a prototyping contract for, and hypersonic weapons.

We're working the reprogramming actions now to determine how much of that acceleration we can actually do financially, and we'll work with you on that in our next budget submission. But if we're able to fully fund just those eight programs, we're going to achieve over 25 years of total program acceleration just in those eight programs alone by using the authorities you've given us.

To do that, it takes more discipline, it takes better oversight by the Air Force of those programs. But as a result of those programs, the way they're structured, Congress will actually get more reporting, not less, as we use prototyping and experimentation, and accountability is clearer.

We're just at the beginning of this. I would ask you to let us implement and report back and learn, but I'd particularly caution against anything that reverses the course that separates back authority and responsibility again or multiplies it out among offices or erodes the service autonomy that's allowing us to tailor acquisition and perform faster. Let us try this because I think we're going to see some great results.

Senator HOEVEN. After all, time is money, right?

Secretary WILSON. Yes, sir.

Senator HOEVEN. And we appreciate what you're doing with it.

General Goldfein has been to Grand Forks Air Force Base, and to the Northern Plains Test Site, and to the Grand Sky Technology Park, and he was an all-star. He not only did a great job with the men and women of the Grand Forks Air Force Base, who are fantastic, but we went over to the Tech Park and so forth. He stayed longer and participated and was incredibly well appreciated by everybody.

PILOT SHORTAGES

You and I talked about you coming as well. We look forward to that very much. I appreciate your willingness to do that, not only for the UAS (Unmanned Aircraft Systems), whether it's Global Hawk, Predator, Reaper all the other types of unmanned aircraft aviation. The tech companies are coming in there, they interface with training Customs and Border Protection. But the other thing I'm going to wrap up on this—is the pilot shortage. Innovative ways to reach out and get after this critical, critical pilot shortage, which isn't just the military, it's across the board.

So I would just like to wrap up with each of you touching that issue and how you are working to address the very acute pilot shortage.

General GOLDFEIN. Yes, sir. And I can't thank you enough for helping us with the initiative, because you correctly stated, this is a national challenge. And while we have initiatives that we are working on strongly within the military for those things we can control, it's the shortage of pilots to be able to do commercial business and military aviation that we face as a Nation. So incentive programs like you built that allow us to build more pilots to get more young people excited about getting airborne, that's exactly the right direction, and I know we look forward to working with you and this committee in the future to put more incentives in place.

Senator HOEVEN. Thank you, General.

Secretary, anything else?

Secretary WILSON. Senator, just to echo what General Goldfein said, I think that anything that helps relieve the pressure on the shortage of pilots, whether it's military, Customs and Border Patrol, or civilian, helps all of us.

Senator HOEVEN. General, you used exactly the right word, you will see real excitement there coming from all these different areas. It really is exciting.

Thanks so much again to both of you.

Secretary WILSON. Thank you, sir.

General GOLDFEIN. Thank you.

Senator SHELBY. Senator Schatz.

Senator SCHATZ. Thank you, Mr. Chairman.

ENERGY RELIABILITY

Thank you, Secretary and General, for being here.

Let me start with a conversation, Secretary Wilson, you and I have been conducting ongoing, and that's about energy assurance and how the Air Force's requirements are different from other—than the service branches. I know that reliable access to air—power at Air Force installations is particularly important for your missions because you operate from bases in the United States to support our warfighters around the world, it affects your energy needs. If the civilian grid goes down, for example, the Airmen on our bases in Creech or Beale flying drones in Afghanistan can't support our counterterrorism operations. Can you talk about how energy reliability at our installations both forward and especially at home drives the Air Force's energy needs and what we're doing about it?

Secretary WILSON. Senator, for the Air Force particularly, we have to expect—and we fight from our bases—and so we have to expect that someone would seek to deny us power in order to be able to fight the fight. And so energy resilience, whether that is backup power, independence of our grid, the turning waste into energy, those kinds of things are important for the Air Force.

It's also important to reduce the demand for supplying forward bases. You mentioned Afghanistan. If you can turn waste to energy onsite, you spend a lot less time bringing fuel into those areas and a lot less risk for our Airmen and their families.

Senator SCHATZ. There are a couple of interesting programs happening in each service branch. My concern is whether or not the information gathered through those initiatives are being shared across service branches. Now, I understand the requirements are somewhat different, but really they're not totally different. There are electrons flowing, and then there are fuel. And so I just want to be reassured that whatever you're doing in the Air Force is shared across the whole Department of Defense, and likewise, I think the Navy is doing some pretty interesting things.

So can you assure me that you are sharing information or that it's—you know, I know that you're talking, but I'd like to see something a little more formal so that there's an integration of what is learned because this is the science fair stuff. These lines in the appropriations bill allow you to do what you need to do, and if you learn something, particularly in waste energy or in energy assur-

ance on the civilian grid side, whatever it may be, I want to make sure that that's applicable across the Department of Defense.

Secretary WILSON. Senator, absolutely. And one of the things that the Air Force and the Army did recently is we now collocated our offices for energy resilience. So the Army and Air Force offices are collocated. Technology transfers, ideas on technology transfer best on two feet, and by putting them together, we think that that's probably a good way to do it.

Senator SCHATZ. Great. Thank you.

THREATS IN THE PACIFIC

General Goldfein, I know the Air Force is working hard to stay ahead of the A2AD threat in the Pacific, and this budget request is focused on developing the tech to ensure the Air Force can continue to deliver information to our warfighters in the field regardless of the threat. Can you talk more about the threats in the Pacific and how they're evolving and how the investments the Air Force are making will address them?

General GOLDFEIN. Yes, sir. And I'd be happy to also come in at a time of your choosing to walk you through a classified assessment of that as well. What I can say in the open here is that no country on the planet can take a block of wood and put it over its country and protect it. The best they can accomplish is to put a block of Swiss cheese, and there are holes there. And it's our job, as an Air Force, to be able to understand where the holes are, exploit them with our capability, our technology, and our folks, and be able to go and do what we need to do to hold targets at risk.

And the way I look at air superiority, it's about penetrating, persisting, protecting, and punishing. And we've got to be able to do that and hold targets at risk for the President across the globe, and today's Air Force can do that, and our investment ensures that tomorrow's Air Force can as well.

Senator SCHATZ. Thank you.

MAUI SPACE SURVEILLANCE SITE

Secretary Wilson, I know the Air Force has among its top priorities to move forward with defensible space posture, especially as our adversaries build weapons to deny the use of space. And a key part of this is the space situational awareness mission to ensure that we're tracking objects and protecting our satellites from debris and potential threats from our adversaries. Now, can you talk about how the Maui Space Surveillance site plays a role in the Air Force's move towards a defensible space posture?

Secretary WILSON. Senator, one of the—when we talk about moving to defensible space, the first thing you need to do is to have a good idea of what's going on around you. So space situational awareness is what we call that. In the past, when it was an uncontested domain, we kind of just kept a catalog of what was up there, and we'd check, "Yeah, it's still in the same place it was last week." That's not good enough in a contested domain, so you have to have near real-time understanding of what's out there and what's moving. So some of those will be space-based, some of those capabilities will be ground-based, like Maui, and all of them need

to be integrated together for that near real-time picture of everything that's happening in space.

The Air Force tracks about 20,000 or so objects in space that are larger than a softball. There are some we're more concerned about than others. But this global network, of which Maui is one part, is important for the security of our space assets.

MAUI HIGH PERFORMANCE COMPUTING CENTER

Senator SCHATZ. So as I understand it, sort of for a layman to understand, you're collecting all these datasets, but something has to do the sort of real-time computation to sort it all out and make sense of it because you can get too much data, and then it's not actionable. So can you talk a little bit about the Maui High Performance Computing Center and its counterparts across the country and the sort of importance of investing in computational power to make sense of all of this?

Secretary WILSON. Let me give you an example. Over Easter weekend, we were tracking the Chinese space station that was deorbiting. We were doing that out of Vandenberg, California, but we were using these high-performance models to get data off of what that satellite, that degrading satellite, was doing, and then be able to predict where it was going to hit the Earth. So that's why those high-performance computing capabilities are important, so we not only track where something is, where it's changed on a last revolution around the Earth, and then as it degrades, where it's likely to hit. And it ended up hitting in the Pacific.

Senator SCHATZ. Thank you.

Senator SHELBY. Senator Daines.

Senator DAINES. Chairman Shelby, thank you.

Secretary Wilson, General Goldfein, thanks for appearing here today.

Secretary Wilson and General Fletcher, thanks for the thoughtful discussion yesterday in my office, stepping back and looking at global threats.

Montana is very proud to support some of the Air Force's most critical missions. Its location provides an ideal home for the 341st Missile Wing with its strategic nuclear assets and truly world-class missileers, not to mention the vast Powder River Training Complex provides an unparalleled training opportunity for the joint force. It's also the proud home of nearly 1,000 citizen Airmen of the 120th Airlift Wing, who stand ready to transport personnel and equipment anywhere in the world whenever needed. These Airmen represent the best America has to offer, and we are grateful for their service.

Last September, in a speech before the NGAUS Annual Convention, General Goldfein highlighted the strategic advantages and budgetary efficiencies of having our ICBM (Intercontinental Ballistic Missiles) assets and long-range bombers collocated at Minot Air Force Base in North Dakota. I find that argument very compelling and believe these same advantages could be attained at Malmstrom Air Force Base in Great Falls, Montana.

B-21 BOMBER

Secretary Wilson, much of the B-21 bomber development has been shrouded in secrecy, and for good reason, but when can Congress expect, as well as the American people, to see a strategic basing plan?

Secretary WILSON. Senator, we have announced publicly that bases that have bombers now will have bombers in the future, and we are doing an initial look at the three bases where there are B-1s and B-2s for the bed-down of the initial B-21s. The plan currently is that we have no less than 100 B-21s, and the rest of the fleet, up to 175, will be B-52s. So we will divest of the B-1s and B-2 aircraft.

We are currently going through a review to look at the National Defense Strategy and the Nuclear Posture Review to tell the Air Force, “All right, to implement this strategy, how many aircraft and squadrons do we actually need, including bombers, fighters, space assets, across the board?” When I say—I want to be very careful to say it is no less than 100 B-21s. And this review, which the Chief and I expect to see the initial draft of in August, but which we owe to the Hill by next March, should tell us whether we will need more Force structure than 100 B-21s.

B-21 CONSTRUCTION REQUIREMENTS

Senator DAINES. Thank you. We’ve been looking at the fiscal year 2019 budget request. It doesn’t yet identify military construction requirements for the B-21. And respecting the need to safeguard our technologies and our capabilities, isn’t it about time for the Department to begin planning the practical and the logistical aspects with the States that will be affected?

Secretary WILSON. Senator, we announced about 2 weeks ago that we’re doing the initial survey on Dyess, Whiteman, and Ellsworth, which are the current B-2 and B-1 bases. If we were to include—if we go beyond that, it costs more to shift from a base that is not currently equipped for bombers, and our estimate is probably about 450 million per base if they don’t currently have a bomber mission. This is in addition to the investments that need to be made to prepare existing bomber bases to receive the B-21, which is why we’re starting out with the bases that do have bomber missions.

Senator DAINES. I’ll pivot over and talk about our UH-1N issue, the replacement. I’m greatly concerned about the aging Huey fleet. It’s like watching “Good Morning, Vietnam” when you spend time watching those aircraft. They provide security to our nuclear missile fields in Montana, and although if the replacement program for the aircraft is currently undergoing source selection, I understand that it may have stalled to a GAO (Government Accountability Office) protest.

UH-1 REPLACEMENT

Secretary Wilson, is the Air Force still on track for a 2021 delivery of the UH-1 replacement? And what efforts has the Department taken to move forward during this protest?

Secretary WILSON. Senator, there is a protest on the UH-1 replacement. It was a protest that was lodged before the proposals are even in. GAO's review is supposed to be done on the 23rd of May. The Air Force is providing all—rapidly providing information that GAO is asking for, so it's not delayed any further than the 23rd of May. But I would say that for some companies, there's a tendency to fund your proposal at the same time you're funding your protest development, and we need to, in some way, get beyond that so that we're not delaying acquisition because we have to build for 6 months of protests into every one. We've—97 percent of the time the Air Force is found to have conducted these procurements properly, but we still have to add time into our schedules because of these kinds of protests.

UPDATE ON GROUND-BASED STRATEGIC DETERRENCE MODERNIZATION

Senator DAINES. Thanks for the thoughtful answer.

Shifting gears, I want to talk about the modernization of the nuclear triad. I was very pleased to see the updated Nuclear Posture Review earlier this year, which recognizes the strategic importance of a nuclear triad and prioritizes its modernization.

Secretary Wilson, can you provide an update on the modernization efforts for the Ground-Based Strategic Deterrence program?

Secretary WILSON. Senator, the Ground-Based Strategic Deterrence is moving along, actually in this year it's moving along faster than scheduled, which is why we may have a reprogramming to continue—to continue the schedule, and try to get a little bit ahead of the game, but it's going well.

NUCLEAR INFRASTRUCTURE UPGRADES

Senator DAINES. The fiscal year 2019 budget only calls for infrastructure upgrades at one of the ICBM wings, while contractors at all three stand ready to break ground. Provided additional resources, is the Air Force prepared to move forward in updating our nuclear infrastructure?

Secretary WILSON. Senator, we have infrastructure needs across the board in the Air Force, and we're quite far behind. It's one of the areas where, in the wake of sequester, the Air Force reduced its budget significantly. The priorities for military construction, the top priority for military construction, each year is new missions. And so we try to prioritize those each year.

Chief, do you have anything else on that one?

General GOLDFEIN. Well, just that also the other areas that we prioritize very highly is combatant commander needs, and it's primarily in accordance with the National Defense Strategy in support of the China, Russia campaigns, the global campaign plans. So we look at combatant command requirements, and as the Secretary rightfully stated, we look very closely at new mission MILCON (Military Construction) as our priorities.

Senator DAINES. Thank you. I'm out of time. Thanks for the thoughtful answers.

Senator SHELBY. Senator Tester.

Senator TESTER. Thank you, Mr. Chairman. And I want to thank both of you for being here. And I want to thank the people that you represent that aren't here today. So thank you very much for your

commitment to this country. And I want to invite you both to Montana to come see Malmstrom and the 120th at your convenience. We'll show you some of the best people, some of the most committed people that we have. And I'm a little biased on that, so it's okay.

PILOT BREAKDOWN

I want to go back to a question that the chairman and the ranking member asked, and Senator Hoeven touched on it, it has to do with the pilots. Can you give me any sort of breakdown as to how many of those 2,000 pilots that are needed are in the active military versus Reserve versus Guard?

General GOLDFEIN. Sir, it's actually a moving target relative to total numbers. Right now, if you take a look at what we are short, it's approximately 2,000. Most of those are in the active.

Senator TESTER. Okay.

General GOLDFEIN. If I could take that for the record on giving you exact numbers on what their breakdown is, because it tends to move, but the vast majority are active duty.

Senator TESTER. And if you could give me also the breakdown on fixed-wing versus rotary.

General GOLDFEIN. Absolutely. Absolutely.

Senator TESTER. That would be really good. Thank you.

And then the other question I had that I think could be helpful is that—you know, I just met with some airlines yesterday, as a matter of fact, and they talked to me about the pilot shortages, as you've talked. And you're right, they're going to be looking to the military to fill their needs.

ENERGY TRANSFER

If you guys have recommendations on what further Congress can do to help you recruit, boy, that would just be very, very important. I know you've got the incentives, but if there are other things we can do, it could be helpful, maybe on the training side of things, I don't know, but it would be good.

I want to talk to you, Secretary Wilson, a little bit about R&D, it's what Senator Schatz talked about, particularly as it comes to energy because I think it could be run across all three: Navy, Army, and Air Force. And you talked about tech transfer. Is that transfer actually happening at this time? And I'm talking about in the areas of energy. You talked about forward bases, waste to energy onsite can be a tremendous advantage for your operations. I agree. And is—there's no need building the ship—building the airplane twice, so to speak. So is that transfer actually happening?

Secretary WILSON. Senator, just to make sure I understand, you mean the transfer from Air Force research projects to other services or just getting it—

Senator TESTER. Yes, and back to you from those services.

Secretary WILSON. Senator, I'm going to take that one for the record as well. We've got our people working together. Some of it has to do with, all right, once you develop a technology, do you put it into all bases, or what are the plans base by base? So let me take that one and get back to you.

Senator TESTER. That would be good. I mean, the concern, and the concern in government generally is that we do things in silos and we don't communicate very well. And I'm not saying that's the case here, but we should try to break those silos down as much as possible.

I do want to talk about another thing that Senator Daines talked about really quick with you, Secretary Wilson, and that's the Huey replacement. Do you see that—and General Goldfein, you can talk, too, if you'd like—it's on track for 2020? Do you see any delays further, or do you see that we can pretty much count on that?

Secretary WILSON. Our intention is to move forward very quickly after the protest is over to be able to get an aircraft and replace the Hueys.

MOVING UP HUEY REPLACEMENT

Senator TESTER. So, right. And you know, I think time is important here. Is there any possibility it could be moved up to 2019? Secretary WILSON. Sir, I think that would be very difficult.

RAMPING UP C-130 FUNDING

Senator TESTER. Okay. Then I want to talk about the apron at the Air Guard for the C-130s. And we appreciate those aircraft very, very much in Montana. If this can't be funded in fiscal year 2019, General, can you assure me that the project will be a priority for the fiscal year 2020 MILCON process?

Secretary WILSON. Senator, I think that ramp is in our fiscal year 2023 plan, so we're talking about—

Senator TESTER. 2023?

Secretary WILSON. 2023. It's the number five priority for the Air National Guard in the Unfunded Priorities List, and it is in our fiscal year 2023 MILCON plan to replace that ramp, it's a cost of about \$9 million.

Senator TESTER. So that means it's not going to be done until 2023?

Secretary WILSON. Senator, it is in the fiscal year 2023 plan, as is.

Senator TESTER. So that's what you said.

Secretary WILSON. Yes, sir.

Senator TESTER. So is there any way we can make that a priority for 2020? Because it is pretty important. We changed from a fighter to a cargo wing. I think it fits Montana very, very well. It's something that we worked hard with previous administrations on, and if there is any way to move that up, and if you need my help in doing that, I think it's important.

INFRASTRUCTURE FUNDING

Secretary WILSON. Senator, I understand. I would say that the underfunding of infrastructure and maintenance is an issue in the Air Force as a whole, and it's one of the ways in the wake of sequester and a budget that was much lower, there wasn't as much money put into maintaining facilities, and it does show.

Senator TESTER. Okay. And so you're trying to catch up now. So—and when I heard your testimony earlier, you like this budget.

I think, General Goldfein, you said this is a budget that's—how did you put that—it drives the other way around. Are you comfortable with the infrastructure component of this budget?

Secretary WILSON. Senator, we're very far behind in our infrastructure, and I think that's a long-term problem. We're not going to be able to fix it in a single year. We're going to have to dig ourselves out of this hole over a number of years.

Senator TESTER. And do you have a—and I know you do because you just said that the apron was for 2023—do you have a 5-year plan or a 10-year plan on infrastructure?

Secretary WILSON. Sir, it's a 5-year plan.

Senator TESTER. 5-year plan? Okay. Good.

Thank you very much.

Senator SHELBY. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

And Secretary and General, welcome, thank you.

I want to raise a couple matters that you and I discussed yesterday, Secretary Wilson, and again thank you for giving us the time that you did. As you know, the folks in the interior are anxious to receive the servicemen and women and their families that will be coming to Eielson with the bed-down of the F-35s. With that is a little bit of stress to the community as they prepare and ensure that we do right by these families in ensuring that they have appropriate housing and schools and everything that comes with making a good, strong community.

FAIRBANKS NORTH STAR BOROUGH HOUSING CONCERNS

There has been concern within the Fairbanks North Star Borough that while they have identified the need for additional housing in close proximity to the base, that there is some concern that the Air Force might move forward and ask an on-base privatized housing partner to build additional units on base that would compete for occupants with the units that are being looked to, to be constructed for Eielson families.

I had an opportunity to raise this issue with General Green when he came before the MILCON Subcommittee, and his words were comforting. But I would ask if you could share with those who have been following this very keenly, share any confidence that you can provide that the Air Force will not undermine the private investment by authorizing the construction of additional privatized housing units on the base.

Secretary WILSON. Senator, we have no plan for doing privatized housing at Eielson other than what's already there.

Senator MURKOWSKI. That will make people move, and I think move in an appropriate way, that I think that surety, that certainty, will allow for that investment to come, and again, the timing line up in a way that we will all be ready.

F-35 SUSTAINMENT

I wanted to ask about the sustainment issues related to the F-35s and the recognition that the sustainment costs are presently an issue, spare part shortage are listed as one of the main issues. Can you give me an update on this matter, where whether or not the sustainment issues are in the process of being resolved? Are you

concerned that it may delay or affect in any way the deliveries of the new F-35s? And do you anticipate that we might be facing funding shortfalls as a result of this, particularly as it might relate to like the spare parts supply?

Secretary WILSON. Senator, let me just echo one of the things that General Goldfein said earlier in the hearing, that the F-35 is a game-changer for us, and he described the exercise—

Senator MURKOWSKI. I love the description.

Secretary WILSON. It's the exercise at Nellis, the Red Flag exercise. The kill ratio for the F-35 is 20:1, 20:1. It is an amazing aircraft because it's not just the aircraft, it's how it connects to everything else.

With respect to cost, the purchase price for the F-35A is now, by fiscal year 2019, will be less than \$80 million a copy, which makes it comparable to a fourth-generation fighter. So you get a fifth-generation fighter at a fourth-generation fighter price.

Our budget proposes to buy 48 of them in fiscal year 2019, and our focus now is on driving down the costs of maintenance and the flying hour costs. There are a number of ways we're going after that, and of course, this is a program that's done with a joint program office that covers the partner countries as well as the Army, Navy, and—rather, the Navy, Marine Corps, and the Air Force.

But the focus on sustainment costs is where we are spending a lot of time now as the Air Force because we're the largest customer for the aircraft. And as we drive down those costs, our objective is to get the cost per flying hour of an F-35 equal to or better than a fourth-generation fighter. And then there's really—there's just really no comparison in the way it fights and then in the way we will support it.

Senator MURKOWSKI. So you sound pretty confident that things will stay on track, on schedule.

Secretary WILSON. On schedule, yes, ma'am, with respect to the—we have no concerns about the schedule of the delivery of the aircraft as they're coming off the line. We are now focusing on the long term and driving down the costs of maintaining the aircraft.

AIR FORCE RECRUITMENT

Senator MURKOWSKI. Good. Let me raise the issue of recruitment. Senator Tester has addressed this, and others have as well. Your statement, the Air Force recruits Airmen, but we retain families. I think that that is—it's so appropriate and so fitting that we recognize that the investments that we make in whether it is child care facilities or expanding the child care hours, off-base support, all of these are things that I think we look to. And it really does act as a force multiplier, if you will, when it comes to maintaining morale on bases. Certainly, within the Alaska communities, we've got a great deal of pride in how we embrace and support our military families.

You raised an issue with me yesterday that I thought was very interesting. So many of our military spouses are needing to work or are wanting to work, particularly in Alaska, where it's high cost, having that second income is really helping our military families, but we don't make it easy for transferability of licensure and certifications. And you raised that as an issue with me that I

thought—when we think about, well, what can we do to help you recruit, retain? So can you speak to this issue just a moment, please?

Secretary WILSON. Senator, when we are out listening to Airmen as to what matters to them, there are two things that kept coming up. And I have breakfast with my colleagues, the three service Secretaries get together every 2 weeks for breakfast, and we talk about different things, and the same issues are coming up with the other services. And so we chose to send a joint letter to all of the Governors that highlighted two things that we will take into account in future basing decisions in addition to mission and environment and personnel and all of those things.

There are two factors that matter a lot. One is the quality of the schools. An Airman is four times as likely to have a college degree as the community in which the Airman lives. And so schools for their children matter a lot, and their children move around a lot, so it matters.

The second is reciprocity of licensure for spouses or family members of military members. So if you're a teacher and you're assigned in Idaho, and you move up to Alaska, being able to go right into the classroom and not have to be recertified in Alaska, or a CPA, or a cosmetologist, or a family therapist.

And I've heard these stories around the Air Force where—in fact, I was talking to a Captain when I was at Hanscom Air Force Base. His wife was a licensed family therapist. It took her 18 months when they moved from Florida to Massachusetts to get her license certified in Massachusetts. So universal reciprocity of licensure, which is a State issue, would really help. And we've decided we're just going to take it into account when we do basing decisions because it matters to our Airmen.

Senator MURKOWSKI. Well, I thank you for raising that, and I think that each one of us, when we are back home in our States, can help assist with this. We should not be putting barriers in front of these workforce opportunities, and when it's simple licensure issues and reciprocity and the ability to transfer, it seems to me that we can do a better job. So I thank you for that, and I look forward to working with you.

Secretary WILSON. Thank you.

Senator MURKOWSKI. Thank you, Mr. Chairman.

Senator SHELBY. Thank you, Senator Murkowski.

Senator Udall.

Senator UDALL. Thank you so much, Chairman Shelby.

And Secretary Wilson, thank you for your service.

And General, thank you, and it's really good to have you here today.

You have made access to space a priority for the Air Force, Secretary Wilson, and this budget request reflects that priority. And I'm telling you some things about New Mexico. She knows New Mexico very well. But New Mexico continues to lead in this field. In the past, the New Mexico delegation fought to ensure that the Air Force does not cut the Operationally Responsive Space program, the ORS initiative, at Kirtland Air Force Base. This program is at the forefront of developing small satellite technology for national defense.

Today, ORS is in the process of becoming the Space Rapid Capabilities Office. There is now potential for Space RCO in Albuquerque to lead the Nation in space innovation. To do that, I believe we must tap into the creativity and risk-taking culture of the private sector. I think that the Air Force not only needs to change the name of ORS and increase the workforce, it needs to give Space RCO the budget and flexibility to make quick decisions to innovate and ensure access to space.

IMPROVING SPACE PROGRAM CAPABILITIES

Secretary Wilson, how do you aim to increase cooperation with the commercial space sector to improve our rapid launch capabilities? And you stated that Congress needs to accept risks in developing new space capabilities. What risks should Congress accept? And how will Space RCO and the Space and Missile Systems Center manage these risks?

Secretary WILSON. Senator, you're right, we don't—the authorization bill last year changed the name. We don't want to just change the name, we want to change the way in which the new Space Rapid Capabilities Office does its work, and here are a few things that we're doing. First of all, we're adding additional people into the Space Rapid Capabilities Office. There will be about 50 more people added into that mission. We are selecting a new Director, who has a background that we think will be a good fit for an organization that's very high performing and that connects with what's going on in commercial industry.

The rapid—it's modeled the "Rapid Capabilities Office" for the Air Force handles some of our most important—strategically important—programs, usually highly secure programs, that go very quickly. It's a small office, and it reports directly to the Secretary, to kind of a board that includes the Chief and me. So it moves very quickly and under very senior authorities. We are working through what that looks like for the Space Rapid Capabilities Office so that they can have the same kind of dynamic in order to take advantage of path-breaking capabilities and spin them on into the Air Force through what used to be the Operationally Responsive Space Office.

There's one other project that the Space RCO will be able to be part of. We've already set up a special innovation fund, the Space Enterprise Consortium (SpEC). It's part of the new authorities that the Congress has given us. It's a \$500 million fund for innovative companies to propose new capabilities for space and to be able to contract with them with very simple contracts. We call them "Other Transaction Authorities." We announced it in February. There are already 150 plus companies that have shown interest, joining as members of the SpEC. We just let the first two contracts, which are for microsatellites that will go directly to the geostationary orbit.

Senator UDALL. Yes. Thank you very much for that answer. And we really look forward to working with you on these issues.

I hope, Mr. Chairman that we can work with you and the rest of the committee on the private sector needs in terms of securing facilities to do business with the Air Force.

IMPORTANCE OF ROCKET LAUNCH LOCATIONS

Secondly, the Rocket Systems Launch Program has additional funds in this year's budget proposal to acquire small launch services for the Air Force. In addition, the Defense Advanced Research Projects Agency Challenge is offering a \$10 million prize to a launch provider that can launch twice into low-Earth orbit from two different sites with the ultimate goal of increasing launch flexibility and perhaps using alternative inland launch locations. Spaceport America in New Mexico is one location positioned to support national security and support national security requirements for rapid launch capabilities.

How important is it for the Air Force to have a diversity of launch locations, especially considering that existing coastal launch locations could be compromised or unable to be used due to weather?

Secretary WILSON. Senator, we use two launch locations, at the Cape and Vandenberg Air Force Base. We also just recently contracted with Virgin Galactic for a launch off of—their approach is to launch rockets off of a 747, modified 747, and take it up to a 30,000-foot altitude and launch the rocket from underneath the wing, which is both cost effective and also gives you a lot of flexibility with respect to access to space because any airport that can take a 747 can launch.

Inland launch has some disadvantages to it because your potential recovery zone or your safety zone is over land rather than water, and that's an issue even at the Cape with some trajectories. So that is the primary concern with an inland launch.

Senator UDALL. Yes. Well, we look forward to working with you on that. I think the issue of pilot shortage has been covered. I also have a question a little bit different there.

QUALITY OF LIFE FOR REMOTE AIRCRAFT PILOTS

But I wanted to ask as my final question, quality of life for remotely piloted aircraft pilots has been a topic that's come up repeatedly during my travels to Cannon and Holloman Air Force Bases. In addition, recognition of the important work they do to protect the homeland is greatly needed to improve their morale. How is the Air Force addressing the quality of life for the remotely piloted aircraft community? Has there been progress improving retention? And how can this committee work with you to improve retention and better recognize these pilots?

General GOLDFEIN. Sir, thanks for recognizing these great Airmen who are doing yeoman's work now today, as you know, across the globe.

We started on this journey a few years ago, and our path that we were set on was to, first of all, increase the ratio of crew because what we had built, because of the acceleration of the demand signal, what we had built was an enterprise that was only doing combat operations, and every time we tried to mature the organization, we got more demand signal. So by having the Secretary of Defense stop the growth of caps, if you will, or the number of orbits to 60 orbits, and allowing us to grow the crew, we are now achieving a 10:1 crew ratio. That probably has more impact on quality

of life. It also allows us to get these airmen into what we call a dwell, which is some period of time when they're in combat and some period of time they're in training, and we weren't able to do that before. And so by building up our numbers, we've done that. And then we've got a series of Force Improvement Programs that we're doing, not only managing them as a talent pool, but also looking at the broadening of this career field so that they can do the business of remotely piloted aircraft, but also get into some other exciting career fields that they're ideally suited for. So thanks for the question.

Senator UDALL. No, thank you very much. And that, outlining that, really helps me because when I and my staff travel out there, we'll be able to give them a good idea of what you're looking at.

So thank you very much. I have some additional questions for the record, but we look forward to timely answers on those.

Thank you very much.

ADDITIONAL COMMITTEE QUESTIONS

Senator SHELBY. Thank you, Senator Udall.

We appreciate, Secretary Wilson and General Goldfein, we appreciate your appearance before the committee. Senators will submit additional questions for the record, and we would hope you would respond to those questions within 30 days.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO HON. DR. HEATHER WILSON AND GENERAL DAVID L. GOLDFEIN

QUESTIONS SUBMITTED BY SENATOR MITCH MCCONNELL

C-130J RECAPITALIZATION FOR THE AIR NATIONAL GUARD

Question. In the fiscal year 2017 defense appropriations law, Congress procured and directed two C-130Js to the Air National Guard, and in the recently enacted fiscal year 2018 omnibus appropriations law, Congress directed an additional six C-130Js to the Air National Guard. Can you please provide an update on the basing plans for these aircraft and describe the stationing process? How will the basing decision be made, and who holds the final decision? When are these congressionally added aircraft scheduled to deliver?

Can you please provide an update on the basing plans for these aircraft and describe the stationing process?

Answer. The intent is to recapitalize an existing, single ANG C-130H unit with the new aircraft.

Question. How will the basing decision be made, and who holds the final decision?

Answer. In this case, the Air National Guard will be the lead agency in determining the beddown location for the eight C-130Js. AMC will provide oversight and input as the lead MAJCOM for C-130s. In this case, the ANG will use the Air Force Strategic Basing Process to achieve SecAF approval for the basing location of the eight C-130Js. The Commander, Air Mobility Command and Director of the Air National Guard will review and provide coordination on the basing decision package prior to SecAF approval.

Question. When are these congressionally added aircraft scheduled to deliver?

Answer:

—Fiscal Year 2017 Congressional Add—Delivers 2 aircraft in fiscal year 2021

—Fiscal Year 2018 Congressional Add—Delivers 2 aircraft in fiscal year 2022 and the remaining 4 in fiscal year 2023

If the expected delivery schedule stays on track, the basing process should start no later than fiscal year 2019 in order to be ready for recapitalization of the selected ANG C-130 unit by fiscal year 2021.

SUBCOMMITTEE RECESS

Senator SHELBY. And subject to all that, the Defense Subcommittee will reconvene on Wednesday, June 6th, at 10:00 a.m., to receive testimony from the Department of Defense related to innovation and research.

The subcommittee stands in recess.

[Whereupon, at 11:26 a.m., Thursday, May 17, the subcommittee was recessed, to reconvene at 10:00 a.m., Wednesday, June 6.]