

**DEPARTMENT OF DEFENSE AUTHORIZATION FOR
APPROPRIATIONS FOR FISCAL YEAR 2021 AND
THE FUTURE YEARS DEFENSE PROGRAM**

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES

UNITED STATES SENATE

ONE HUNDRED SIXTEENTH CONGRESS

SECOND SESSION

ON

S. 4049

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2021 FOR MILITARY
ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CON-
STRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF
ENERGY, TO PRESCRIBE MILITARY PERSONNEL STRENGTHS FOR
SUCH FISCAL YEAR, AND FOR OTHER PURPOSES

PART 2
SEAPOWER

MARCH 4 AND 11, 2020



DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2021 AND THE FUTURE YEARS DEFENSE PROGRAM—Part 2 SEAPOWER

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CONTENTS

MARCH 4, 2020

	Page
NAVY SHIPBUILDING PROGRAMS	1
MEMBERS STATEMENTS	
Statement of Senator David Perdue	1
Statement of Senator Mazie K. Hirono	5
WITNESS STATEMENTS	
Geurts, The Honorable James F., Assistant Secretary of the Navy for Research, Development, and Acquisition	6
Questions for the Record	41

MARCH 11, 2020

MARINE CORPS GROUND MODERNIZATION	43
MEMBERS STATEMENTS	
Statement of Senator David Perdue	43
Statement of Senator Mazie K. Hirono	44
WITNESS STATEMENTS	
Geurts, The Honorable James F., Assistant Secretary of the Navy for Research, Development, and Acquisition	46
Smith, Lieutenant General Eric M., USMC, Commanding General, Marine Corps Combat Development Command; Deputy Commandant for Combat Development and Integration	47
Questions for the Record	73

**DEPARTMENT OF DEFENSE AUTHORIZATION
OF APPROPRIATIONS FOR FISCAL YEAR
2021 AND THE FUTURE YEARS DEFENSE
PROGRAM**

WEDNESDAY, MARCH 4, 2020

UNITED STATES SENATE,
SUBCOMMITTEE ON SEAPOWER,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

NAVY SHIPBUILDING PROGRAMS

The Subcommittee met, pursuant to notice, at 10:04 a.m. in room SR-222, Russell Senate Office Building, Senator David Perdue (Chairman of the Subcommittee) presiding.

Subcommittee Members present: Senators Perdue, Wicker, Tillis, Hawley, Hirono, Shaheen, Kaine, and King.

OPENING STATEMENT OF SENATE DAVID PERDUE

Senator PERDUE. The Senate Armed Services Subcommittee on Seapower convenes this morning to examine the Navy shipbuilding programs in review of the defense authorization request for fiscal year 2021 and the future years defense program.

This is our Subcommittee's first meeting of the year, and I look forward to continuing our tradition of working in a bipartisan manner this year. Ranking Member Hirono, thank you for your continued leadership. She and I visited the Hawaii facilities last year, and she has been a stalwart with regard to the Navy and the Navy requirements.

We welcome our three distinguished witnesses: the Honorable James F. Geurts, Assistant Secretary of the Navy for Research, Development, and Acquisition; Vice Admiral James W. Kilby, Deputy Chief of Naval Operations for Warfighting Requirements and Capabilities; Lieutenant General Eric M. Smith, Deputy Commandant of the Marine Corps for Combat Development and Integration. Gentlemen, thank you so much for your service and for being here today.

Today the world is more dangerous than anytime in my lifetime. I agree with the National Defense Strategy that today we are facing five key threats across five domains, China, Russia, North Korea, Iran, and global terrorism has not abated.

The domains used to be land, air, and sea. Today we have to be prepared to compete in land, air, sea, cyber, and space. As we

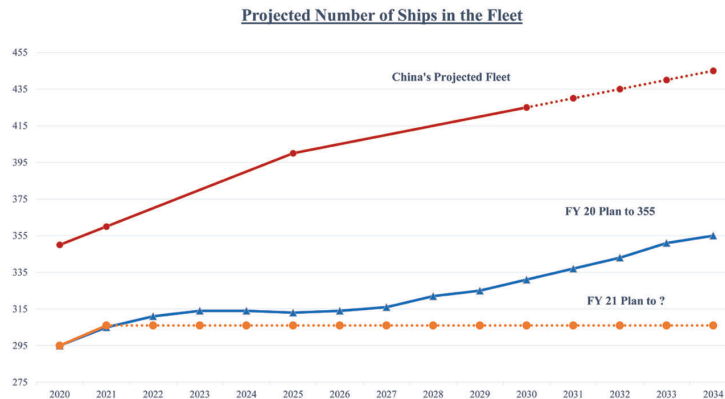
speak, our country's adversaries are plotting to undermine us, overtake us, and in some cases eliminate our very way of life.

Our military remains the envy of the world, but the competition is picking up and we cannot be complacent.

Thanks to President Trump's leadership, we reset defense spending in 2017, and we are beginning to rebuild the military after many years of delay. But the hole is deep. Work has just begun. I commend our witnesses for submitting a budget that continues the trend of better funding the readiness accounts that support today's Navy and Marine Corps.

In 2016, the Navy increased its minimum requirement to 355 battle force ships, a reflection of the strategic shift to great power competition. Today the Navy stands at 295 battle force ships, and we have a chart to illustrate where we are today.

[The chart follows:]



Senator PERDUE. The blue line is the fiscal year 2020 plan to 355 ships. If you look at where we are today, the year 2021—that gets us to 305, and after that, we do not have a plan today. We will talk about that in just a minute. So there is a dramatic shortfall if we take the status quo today. Now, I know nobody is suggesting that today, but we do have a situation where we really do not have the updated shipbuilding plan from the Department of Defense.

It appears to me the Department of the Navy's proposed budget is sufficient to support a fleet of about 300 ships today. The budget proposal for fiscal years 2021 through 2025 does not keep pace with inflation, which means that growing the Navy much at all, much less to the 355 ships we need to meet all the threats we face is financially unrealistic.

An example of the financial challenge is 10 fewer ships are planned for procurement in fiscal years 2021 through 2025 as compared to just last year, including one less *Virginia*-class submarine in fiscal year 2021. I find this situation personally unacceptable given the NDS [National Defense Strategy] requirements and what we know our adversaries are doing. I believe the need for a larger, more capable fleet is clear.

I think it is time we rethink how we fund our Navy and shipbuilding enterprise. Today, we spend roughly \$750 billion on our

military. Each department of the military gets roughly one-third of what is left after we put 14 percent away for overhead. So, that means that the three major services get a third, a third, a third. I am personally not confident that that is consistent with the NDS, particularly with the NDS's requirement to face up to the growing threat from what China is doing in the Indo-Pacific region.

Our current National Defense Strategy is a maritime strategy for sure. As former Secretary Mattis stated, I am skeptical that the current one-third funding level for the Department of the Navy is enough to meet that goal. If we are to remain the global leader above, on, and under the seas, we must get serious about building the fleet we need.

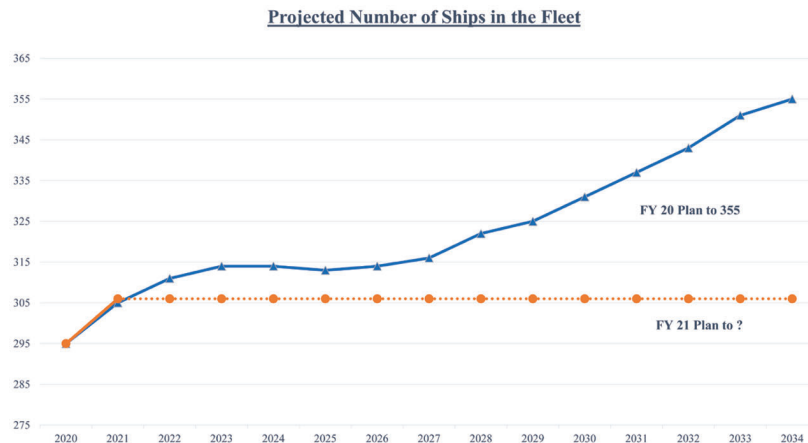
To this end, I believe many promising initiatives are contained in the SHIPS [Servicing the Homeland by Increasing our Power on the Seas] Implementation Act that Senator Wicker introduced last month. I look forward to working with Senator Wicker and Senator Hirono on the proposal for this year's NDAA [National Defense Authorization Act]. Options to improve industrial base stability and fund the *Columbia*-class submarine program, at least partly, outside of the Navy's budget deserve serious consideration.

However, it is difficult to have a discussion on the future fleet, including the associated costs and schedules without a 30-year shipbuilding plan, which by law was required to be submitted to Congress with a budget last month.

In addition, I understand the Department has been reassessing the fleet size requirement over the past 2 years. Based on earlier comments from Navy leaders, I expected this review to be completed by late 2019. Without it, this Subcommittee will struggle to understand just how new platforms are envisioned to integrate into the fleet.

Which brings me to China, and we have all had individual conversations about this. I am going to show one more chart, and I think this highlights the issue.

[The chart follows:]



Senator PERDUE. The problem is this is not a quality/quantity conversation. This is we are the 800 pound gorilla below the seas. We know that. Above the seas, we have got a great 230-year tradition, but we are not large enough. China right now—the fleet is on a very different trajectory from ours, as you can see. China is the red line above. This is public, declassified numbers. The blue line was our 2016 plan to get to 355 by 2034, 14 years from now. China will end up north of 450 roughly. So the old concept that our quality is better than theirs, we can fight our ships better they can—that may be well true, but at some point in time, quantity actually begins to win out.

The Chinese currently have 350 battle force ships and are projected to have 425 by 2030. In contrast, last year's shipbuilding plan showed our Navy on a path to reach 355 by 2034. There is no shipbuilding plan this year in the budget document yet, and the budget documents reflect the fleet size of only about 306 ships. So, we are sitting today at 350 for China and 306 for the United States Navy.

Gentlemen, I know you are in uniform and you are a responsible secretary, and I know you share this opinion. That is totally unacceptable. There is no way, given the fact that we not only have responsibilities in the Indo-Pacific region, but our Navy is required to be around the world today. We need allies' help and we need a serious rethink about what we are asking our Navy to do within the NDS, as it relates particularly to China and this one chart.

If we look at what Russia is doing with their submarines today, it adds even more complexity to this conversation.

I would observe shipbuilding and fleet size trends and therefore the Navy to some extent seem to be going in reverse in this budget request as compared to the Department's previous plans.

The Department of Defense needs to be clear with Congress and the American people—I am saying Department of Defense. It is not just a Navy problem. It is a Department of Defense issue—about the threats and their proposed plans. Article 1, section 8 of the Constitution gives Congress the power to provide—and I quote—“and maintain a Navy.” We have always done a good job of that. It is the Department's responsibility to give us the information we need to carry out this duty, and that is not currently happening yet.

We are also hearing about affordability and the best balance of resources in hearings this year. I applaud that effort to adequately fund personnel, maintenance, and other supporting functions. However, we cannot lose sight of the fact that the Navy must be bigger, we must get bigger, and we must find a way to pay for it because if we do not, make no mistake. The Chinese will only accelerate the expansion of their maritime influence around the globe, creating fait accompli dilemmas at every turn, which come at the expense of United States interests and those of our partners and allies. The stakes are real. Combine that with BRI [Belt and Road Initiative] and made in China 2025, the ports that they have these proprietary loans in in South America and all over Africa, we have to be able to identify that threat as real today.

The Subcommittee will continue to work with the Navy and Marine Corps to build a larger more capable and flexible fleet while at the same time demanding the best use of every taxpayer dollar.

I look forward to our witnesses' testimony today and the answers to our questions.

I now recognize Senator Hirono, our ranking member.

STATEMENT OF SENATOR MAZIE K. HIRONO

Senator HIRONO. Thank you very much, Mr. Chairman, for your very comprehensive opening statement.

Yes, the global threats today are pervasive and complex, and yes, from the standpoint of our Subcommittee, we do question how we are going to get to a 355-ship Navy.

So I would like to also welcome our witnesses to the hearing this morning. Thank you for your service to the nation.

I particularly want to acknowledge the professional service of the men and women under your commands.

We are also grateful for our military families for the vital role they play in the success of the men and women of our armed forces.

Mr. Chairman, of course, it has been a pleasure so far working with you as we confront the issues facing our sailors and marines and their families. The Navy and Marine Corps face difficult decisions as they seek to balance modernizing the fleet, maintaining a technological advantage over our adversaries, supporting ongoing operations, and sustaining today's readiness.

The threats we face around the world require us to consider the best ways to get the Navy and Marine Corps the resources they need. However, we must make sure that any increase in resources does not come at the expense of important domestic programs that families, including our military families, rely on every day. This year we have the benefit of an early budget deal, and I hope that we can move quickly to pass an NDAA for fiscal year 2021.

At today's hearing, we will explore various aspects of the Navy's shipbuilding program. These programs play a critical role in supporting and advancing our country's strategic interests in the Indo-Asia-Pacific region, including of course the bases in Hawaii.

With that in mind, this Subcommittee plays a crucial oversight role as we work to improve our acquisition stewardship to ensure we are getting good value for every shipbuilding dollar that we spend.

The Chief of Naval Operations (CNO) last published an updated force structure assessment in 2016. These assessments are important planning documents that inform procurement decisions for the Navy. Although the Navy had promised a new force structure assessment this year, we now understand that the Secretary of Defense has taken an interest in this document and that it is unclear when we will get the updated version.

It is also unclear when we will get the 30-year shipbuilding plan that is required annually by title 10 of the U.S. Code.

Even without the guidance from these two documents, this Subcommittee is well aware of the Navy's ongoing challenges facing our surface, subsurface, and maintenance programs. The Navy is using multi-year procurement authority to modernize the fleet more efficiently. Congress has approved the use of this authority

to procure attack submarines and *Aegis* destroyers, two platforms that still comprise the largest inventory shortfall compared to the goals outlined in the 2016 Force Structure Assessment. Currently, the Navy is 15 boats short of the attack submarine goal and 14 destroyers below the goal for large surface combatants.

As far as submarine programs, the Navy recently signed a multi-year procurement contract for block 5 of the *Virginia*-class attack submarine. This contract provides authority to purchase nine boats by fiscal year 2023 with the option to buy a 10th boat, if the Navy has the resources and if contractors improve performance on the program. The fiscal year 2021 budget request only includes funding to purchase a single *Virginia*-class submarine. This decision has the potential to put stress on the defense industrial base and jeopardize the Navy's ability to exercise the option for a 10th boat.

In response, the CNO has made funding for the second *Virginia*-class submarine in fiscal year 2021 his number one item on the Navy's unfunded priority list. I hope we can hear more from our witnesses on this issue today.

I am also interested in hearing from Secretary Geurts about the vital role our public Navy shipyards play in maintaining a ready and capable fleet. I want to, once again, thank the chair for coming to see for himself, visiting the Pearl Harbor Naval Shipyard.

I am encouraged that the Navy has finally gotten serious about investing in this critical infrastructure, our shipyards, that has been neglected for far too long. I look forward to hearing from you this morning about how the fiscal year 2021 budget supports this plan.

I also look forward to working with the Navy to ensure that the shipyard modernization program stays on track.

Thank you, Mr. Chairman.

Senator PERDUE. Thank you, Senator Hirono.

Secretary Geurts?

STATEMENT OF THE HONORABLE JAMES F. GEURTS, ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION

Secretary GEURTS. Chairman Perdue, Ranking Member Hirono, distinguished Members of the Subcommittee, thank you for the opportunity to appear before you today to address the Department of the Navy's fiscal year 2021 budget request.

Joining me here today are Vice Admiral Jim Kilby, Deputy Chief of Naval Operations for Warfare Requirements and Capabilities, and Lieutenant General Eric Smith, Deputy Commandant for Combat Development and Integration.

With your permission, sir, I intend to just provide a few brief remarks for three of us.

Senator PERDUE. Yes, sir.

Secretary GEURTS. We thank the Subcommittee and all of the Congress for your leadership and steadfast support of the Department of the Navy. Your efforts to fully fund the fiscal year 2020 budget of 12 ships helps provide the stability, predictability in funding that enable us to build and sustain the naval force the nation needs and, in doing so, execute the maritime component of the National Defense Strategy.

Since the start of fiscal year 2019, we delivered 11 new battle force ships to the fleet, including most recently the USS *Tripoli*, our newest large attack amphibious ship or large deck amphibious ship. Today with the USS *Tripoli* delivered, we have 78 ships under contract and 46 in construction. We expect to take delivery of 12 more ships this fiscal year and award contracts for an additional eight ships this year.

As we continue to modernize the fleet, we have also focused on ship and aviation maintenance, delivering higher aviation mission capable rates, improved on-time deliveries of surface ships for maintenance, and reduced maintenance backlogs in our nuclear-powered fleet.

We achieved key milestones in the USS *Gerald R. Ford*, returning her to sea after a post-shakedown availability and qualifying all the aircraft on her air wing, readying her for deployment, while launching the future USS *John F. Kennedy* ahead of schedule and at a 16 percent reduction in labor hours from CVN 78.

We are on track to begin full construction of *Columbia* in October 2020 with an 83 percent detailed design complete at construction start. That is the highest level of completion in detailed design we have had in any modern shipbuilding program.

Our use of agile and innovative contracting approaches, which have leveraged the many authorities Congress had given us, have enabled us to deliver these ships, aircraft, and weapons at over a \$25 billion savings to the taxpayer. We thank you for the great support and working with us to achieve those outcomes.

Although our budget reflects hard choices we had to make, given the flat top line, our 2021 request builds on these prior investments in improved acquisition outcomes in order to provide the best balanced force in the support of our National Defense Strategy for the resources available. It continues key investments in advanced technologies in modernization and prioritizes the recapitalization of the ballistic missile submarine force. It supports the sustained readiness recovery to deliver credible forces now, as well as increased spending on lethality and modernization to ensure the readiness for the future fight. It includes the procurement of 44 new battle force ships within the future years defense program. As we all know, a healthy industrial base is critical to meeting this demand, and we greatly appreciate the support Congress has given us to stabilize and enhance that industrial base in our shipbuilding programs.

Thank you for the strong support this Subcommittee has always provided our sailors and marines and their families, and thank you for the opportunity appear before you today. We look forward to answering your questions.

[The prepared statement of Secretary Geurts, Vice Admiral Kilby, and Lieutenant General Smith follows:]

PREPARED STATEMENT BY THE HONORABLE JAMES F. GEURTS, VICE ADMIRAL JAMES W. KILBY, AND LIEUTENANT GENERAL ERIC SMITH

Chairman Perdue, Ranking Member Hirono and distinguished members of the Subcommittee, thank you for the opportunity to appear before you today to address the Department of Navy's fiscal year 2021 budget request. First, we would like to thank Congress and this Committee for your leadership and steadfast support of the Department of the Navy acquisition and research programs. Your efforts to fully

fund the fiscal year 2020 request for 12 ships helps to provide the stability and predictability in funding that will enable us to build the Navy the Nation Needs, the maritime component of the National Defense Strategy.

Dominant naval force and a strong maritime strategy are the primary engines of our National Defense Strategy. As we continue to face rapid change in the global security environment, including greater global trade and greater unpredictability, our national security posture must likewise change to adapt to the emerging security environment with a sense of urgency and innovation. This requires the right balance of readiness, capability and capacity as well as budget stability and predictability. It requires us to deliver relevant, effective, capability to our Sailors and Marines, and requires a constant focus on and partnership with the industrial base. They are a key element to our national security.



The character of war has changed, and so must our approach to developing the world's most lethal military force. We are no longer fighting against the great powers of the 19th and 20th Centuries, and conflict is no longer limited to the domains of land, sea and air. The rapid pace of technological innovation means our adversaries have unprecedented access to new tools and technologies. To maintain overmatch means our Navy must maintain warfighting readiness to enable the operational reach, resilience and sustainment that will enable the best Naval forces in the world to operate forward where and when we choose. We are currently on year three of a transformational journey to increase readiness recovery, improve acquisition outcomes and deliver greater lethality, which has seen marked improvement in speed and scale of acquisition, maintenance avails, and recapitalization efforts. These improvements are enabling the Department to better achieve our objectives of building a more lethal force with greater performance and affordability. We will continue to focus our efforts on four key priorities: deliver and sustain lethal capacity, increase agility, drive affordability, and develop the workforce.

DELIVER AND SUSTAIN LETHAL CAPACITY

Since the start of fiscal year 2019 we have delivered 10 relevant and capable ships to the Fleet including an *Arleigh Burke*-class destroyer, a *Virginia*-class submarine, five Littoral Combat Ships, two Expeditionary Fast Transport ships and one Expeditionary Sea Base. Today, the Navy has 79 ships under contract with 47 ships in construction. We expect to take delivery of 12 more ships in fiscal year 2020, and plan to award an additional eight ships this year.



Ship maintenance continues to be a priority focus area for the Department. We are grateful for the strong support we received from Congress as we work to leverage data analytics to provide better predictability and maintenance of our ships, and identify and close performance gaps. In particular, we appreciate your support for a pilot program for private contractor shipyard maintenance in the Pacific. This approach will improve our ability to contract well in advance of an availability start, absorb ship schedule changes from operational demands, and address changes in availability scope. We began executing this authority in February, and our 2021 budget request continues to capitalize on this opportunity by extending the pilot. Predictable stable funding in this area is crucial to incentivize private yard growth.

To support our focus on sustainment, we established a Deputy Assistant Secretary (DASN) for Sustainment to develop, monitor and implement policy and guidance that will enable the Department to better plan, program, budget and execute our sustainment mission. DASN Sustainment will oversee and manage Navy and Marine Corps sustainment and life-cycle management policies, allowing the Department to improve and align the complex drivers of maintenance and modernization completion—that in turn will increase our output to the Fleet.

Navy-wide focus continues on making the USS *Gerald R. Ford* ready for operational use. Going into 2020, CVN 78 will be deployed for 50 percent of the time certifying and testing systems and training the crew, while also being used for pilot generation, which is a critical need for carrier airwing readiness. We established a civilian and government team of experts to work with the shipbuilder to get *Ford's* seven remaining Advanced Weapons Elevators (AWEs) completed prior to the end of the post deployment test and training phase. All 11 elevators will be completed by April 2021, which is the end of the current phase. The *Ford* will be the most capable aircraft carrier ever deployed and our Navy and Industry partners are focused on delivering this capability to the Fleet.

INCREASE AGILITY

Delivering the right capabilities at the right time and sustaining our competitive advantage as a naval force requires an integrated, enterprise approach to business process improvement and modernization. We are moving beyond transactional ways of doing business and towards a fully integrated enterprise, linking our requirements and acquisition processes and integrating these processes with industry to become more agile, accountable and efficient. An example of a fully integrated effort is the Frigate program, where an interactive Conceptual Design process included a

robust dialog with industry, which fed into the requirements documents and development of the RFP. We will be better able to compete and win by expanding that integration and continuing those efforts at scale and at speed.

We conducted our first Wartime Acquisition Support Plan (WASP) industry engagement with the leaders of traditional and non-traditional companies onboard the USS *Gerald R. Ford*. This collaborative engagement allowed our acquisition workforce and program managers to gain valuable insights and recommendations on industry surge capabilities to support the Navy's growing requirements. We will continue these regular industry engagements to build our response capability and ensure we are ready as a Navy to anticipate surge capacity in our industrial base and respond to any contingency.

In addition, we continue to take deliberate actions to challenge bureaucracy. In 2019, the Department cancelled 28 percent of our acquisition-related instructions and streamlined the remaining 72 percent. A thorough review of SECNAV 5000.2F—the primary instruction implementing the defense acquisition system—eliminated duplicative processes and resulted in a 65 percent reduction in page count. By removing the bureaucratic obstacles that slow innovation, we are becoming a more agile organization, better-focused on delivering mission requirements to the Fleet.



DRIVE AFFORDABILITY

Building and sustaining our Navy requires creative and aggressive contracting methods to achieve the right capability. The Department has achieved over \$25 billion in savings through the use of agile procurement and more advantageous contracting approaches. For example, we executed the two-carrier buy (CVN 80/81) contract with Huntington Ingalls Industries—which accounted for over \$4 billion in savings. We achieved additional savings through Contractor Support Services reductions, process improvements, and Multi-Year Procurements for programs such as the DDG 51, *Virginia*-class Submarines, and SM-6. Innovative contracting methods including block buys and smart negotiations supported a seven-fold increase in the number of Other Transaction Authority (OTA) contract awards, two times the number of active Cooperative R&D agreements, numerous prize challenges, and multiple cases of using fiscal year 2018 pricing to accelerate fiscal year 2019 awards.

Last year the Department executed over \$121 billion in contracts, a 12 percent increase over obligations in the previous fiscal year, to approximately 20,000 industry partners. This work was awarded using 18,000 fewer contract actions—all while

reducing the contract modification workload by more than 15 percent. Over 40 percent of the work was awarded through competition, while exceeding small business goals (18 percent actual vs. 14 percent goal) and awarding \$16 billion direct to small businesses.

BUILD A WORKFORCE TO COMPETE AND WIN

A key aspect to increased lethality and readiness is the development of the workforce needed to compete and win. By focusing on our public shipyard and acquisition workforce, we were able to drive efficiencies in the system and better enable the execution of Department priorities. Navy shipyards increased their workforce by 40 percent in the last 10 years, transforming how they train new employees through the use of virtual and hands-on learning centers. The shipyards standardized and reduced regional variability in processes across the public shipyards, and developed “safe-to-fail” areas where artisans can experiment with new and innovative techniques to improve throughput. Through continued transformation efforts, the naval shipyards have successfully reduced the duration of training for an inexperienced worker, in some cases by as much as 50 percent.

For our acquisition professionals, the Department has issued a new Acquisition Workforce Strategic Plan establishing the vision for shaping the future acquisition workforce. We provided commercial online training to expand training opportunities, increased experiential learning through industry rotations, and conducted understanding industry courses at public universities for over 300 members of the acquisition workforce. The Navy is embarking on the development of a Talent Management System to capture and leverage a data-driven solution leveraging commercial best practices for the Acquisition Workforce to develop, retain, and reward people to meet current and future organizational needs. These efforts help ensure we have the right people, with the right skill set to deliver critical capabilities to the Fleet. We focused our Acquisition Workforce Funding to attract talent that will infuse the civilian workforce targeting critical skill gaps such as STEM and Information Technology. The Navy also leveraged section 1111 hiring authorities to hire high quality acquisition and technology experts with a focus on Supply Chain and Sustainment challenges.

THE FISCAL YEAR 2021 PRESIDENT’S BUDGET REQUEST

The President’s fiscal year 2021 budget builds on these initiatives in order to provide the best-balanced force in support of the National Defense Strategy, enabling us to deliver the people, the platforms, and the capabilities necessary to protect American interests around the world. The budget builds on prior investments while making the adjustments necessary to deliver greater efficiency and effectiveness.

The fiscal year 2021 request continues key investments in advanced technologies and modernization of our current Seapower and Projection forces, prioritizing the recapitalization of the strategic ballistic missile submarine, the *Columbia*-class, which remains the Navy’s highest acquisition priority. A healthy industrial base critical to meeting this demand, and the Department greatly appreciates strong congressional support for our nation’s vital shipbuilding program and industrial base expansion. The fiscal year 2021 budget supports the sustainment of our readiness recovery to deliver credible ready forces now, and the aggressive pursuit of increased lethality and modernization with the greatest potential to deliver non-linear warfighting advantages. This includes the prioritization of force design and the delivery of Naval Expeditionary forces capable of imposing cost with distributed, lethal power, and the delivery of capable capacity within the constraints of our available resources.

Given the budget topline constraints, the fiscal year 2021 budget prioritizes a more capable and lethal force over a larger force that would be less capable, less ready and less lethal. It includes procurement of 44 battle force ships within the Future Years Defense Program (FYDP), and shows a realistic approach to planning the future force within projected budgets. The plan remains mindful of the need to keep the shipbuilding industrial base loaded at an effective level that encourages industry investment in capital improvements, capital expansion, and a properly sized world-class workforce.

Sustaining that force structure through the maintenance and modernization will be the key to ensuring those assets can meet operational demands over their design service lives. The Navy continues to execute a number of initiatives that will facilitate a more adaptable and reliable industrial base for ship repair, while providing a foundation to support the workload forecasts of our industry partners. These include improvement in processes to plan and schedule the right work; more realistic assessments of the cost and duration of work; awarding contracts earlier; making

more efficient use of existing industrial facilities and drydocks, and preparing for the future by investing in industrial equipment and personnel training to promote a healthy industrial base. Continued implementation of these essential steps will reduce the maintenance backlog affecting our ships today, and to enable sustainment of the Naval Fleet of the future.

SUMMARY

Thank you for the strong support this Subcommittee has always provided to our Sailors and Marines. The Department of the Navy continues to instill affordability, stability, and capacity into our programs in order to deliver capability to our warfighters faster and be as effective as possible within our resources. With Congress' support, we can ensure the Department's strategic deterrence, readiness, lethality and capacity will continue to deliver superior naval power around the world both today and tomorrow.

Programmatic details regarding Navy and Marine Corps capabilities are summarized in the following section.

DEPARTMENT OF THE NAVY SHIPBUILDING PROGRAMS

SUBMARINES

Ballistic Missile Submarines, coupled with the Trident II D-5 Strategic Weapons System, represent the most survivable leg of the Nation's strategic arsenal and provide the Nation's most assured nuclear response capability. As such, the *Columbia*-class program remains the Navy's number one acquisition priority program and is on track to start construction in October 2020 and deliver to pace the retirement of our current ballistic missile submarines, deploying for its first patrol in fiscal year 2031.

The Fiscal Year 2021 President's Budget (PB) supports the funding required to begin lead ship construction and continue lead ship design and advance construction activities with a plan to achieve a target of 83 percent design completion at construction start, as compared to the 43 percent at start of *Virginia*-class. General Dynamics Electric Boat and Huntington Ingalls Industries-Newport News will procure component and commodity material based upon construction start and supplier lead times in order to support lead ship construction start in October 2020. The Fiscal Year 2021 President's Budget request also funds Continuous Production of Missile Tubes to support procurement of Common Missile Compartment material for the U.K. *Dreadnought*-class submarines being executed under the Polaris Sales Agreement. The award was coordinated with the *Virginia*-class program to maximize efficiencies across the procurement of all large diameter tubes. Also included in the fiscal year 2021 budget are many development efforts to make submarines more capable.

The Navy will build on past success with the fiscal year 2020 award of the Block V multi-year procurement (MYP) contract for the construction of nine ships, with options for additional ships. Starting with the second ship, these submarines will introduce the *Virginia* Payload Module and all Block V ships will have Acoustic Superiority.

The Navy, the shipbuilders and related suppliers recognize that vigilance in the execution and oversight of the *Virginia* and *Columbia* programs is critical. In fiscal year 2020 the Navy will use the \$123 million provided for industrial base support to align shipbuilder-procured material procurements with *Columbia*-class funding with funds budgeted for *Virginia*-class and CVN for common components and vendors. Additionally, the Navy is implementing Continuous Production on selected shipyard-manufactured items to reduce cost and schedule risk, and help strengthen the industrial base with a focus on critical vendors. Advance Construction activities began June 2019 at General Dynamics Electric Boat and Huntington Ingalls Industries-Newport News to proactively manage schedule margin and reduce controlling path risks for *Columbia*.

AIRCRAFT CARRIERS

CVN 78 completed Post Shakedown Availability (PSA)/Selected Restricted Availability in October 2019, culminating with a highly successful sea trial. During the PSA, the Navy and our industrial partners completed production and certified four AWEs, repaired the ship's propulsion system, completed upgrades to the Advanced Arresting Gear (AAG) and corrected over 96 percent of the sea trial discrepancies. The ship is now in an 18-month Post Delivery Test and Trials (PDT&T) phase where the crew certifies the fuel systems, conducts aircraft compatibility testing, exercises the flight deck, and tests the combat systems. We will also complete produc-

tion and certification of the remaining seven AWEs during PDT&T. The Navy continues to see progress in the testing of new systems aboard USS *Gerald R. Ford* (CVN 78). AWEs have been cycled over 5,400 times, including 1,500 at sea, and are performing as designed. CVN 78 successfully completed Aircraft Compatibility Testing (ACT), with over 200 launches and recoveries of different type/model/series aircraft during its at-sea period in January. Successful completion of ACT is an important milestone towards achieving Flight Deck Certification expected in March 2020. The ship is expected to conduct several thousand launches and recoveries between now and completion of PDT&T. Readyng USS *Gerald R. Ford* for deployment is a Navy priority and the Department is working collectively with the Navy shipbuilding industry to transition CVN 78 into Fleet operations. The *John F. Kennedy* (CVN 79) was christened on December 7, 2019, launched 2-months early on December 16, 2019, and is 68 percent construction complete. When compared to CVN 78, CVN 79 is performing at a 16 percent man-hour stepdown. CVN 80 construction is three percent complete by construction man-hours and CVN 81 has commenced material procurement. Additionally, CVN 80 is on schedule to meet its first major construction milestone, keel laying, in the second quarter of fiscal year 2022.

The *Nimitz*-class Refueling Complex Overhaul (RCOH) is key to both the maintenance and modernization of each carrier in support of the second half of its service life. The RCOH is refueling the ship's reactors, modernizing its capabilities, and repairing ship systems and infrastructure. CVN 73 successfully undocked in September 2019 and the RCOH is 68 percent complete with re-delivery planned for December 2021. CVN 74 RCOH advance planning efforts remain on track to commence RCOH in January 2021. CVN 75 will begin RCOH in fiscal year 2025.

LARGE SURFACE COMBATANTS

The *Arleigh Burke*-class (DDG 51) program remains one of the Navy's most successful shipbuilding programs with 67 ships delivered to the Fleet. The fiscal year 2018 to 2022 MYP maximizes affordability and stabilizes the industrial base. These Flight III ships will provide enhanced Integrated Air and Missile Defense with the AN/SPY 6(V)1 Air and Missile Defense Radar (AMDR) and AEGIS Baseline 10. AMDR meets the growing ballistic missile threat by improving radar sensitivity and enabling longer range detection of increasingly complex threats. The program demonstrated design maturity through its successful completion of all developmental testing. AMDR is in production and on schedule for delivery with the first Flight III ships. The 2021 President's Budget requests funding for the procurement of two ships of the MYP contract. The \$520 million increase in fiscal year 2020 Advanced Procurement funding will be used to procure Long Lead Time Material for fiscal year 2021 Flight III ships and to bolster the surface combatant supplier base.

Complementing the DDG 51, the DDG 1000 *Zumwalt*-class guided missile destroyers provide multi-mission surface combatants designed to provide long-range, offensive surface strike capabilities. The DDG 1000 ship is on track for final delivery at the end of March followed by continued testing and a PSA in support of achieving Initial Operational Capability (IOC) by September of 2021. DDG 1001 commissioned on January 26, 2019, is currently undergoing combat system installation and is expected to complete in July of 2020 following further combat system activation and test. Construction on DDG 1002 is over 87 percent complete at General Dynamics Bath Iron Works with HM&E delivery planned for December 2020.

In the fiscal year 2021 budget request, the Navy has budgeted \$46 million of R&D funding for the Large Surface Combatant (LSC). As part of the Future Surface Combatant Force, LSC will fill all the roles and missions of a DDG-51 with additional capability and capacity critical to the future fight. LSC will enable the ability to launch large missiles with extended ranges, and provide a new hull form and electrical/propulsion plant for increased efficiency and survivability, while reestablishing service life allowances for future growth to pace the threat. The LSC will reduce combat system development risk by utilizing mature technologies that leverage the DDG 51 FLT III Navy standard program of record combat system elements and reduce engineering system development risk by land based testing of the propulsion and electrical system integration prior to detail design. Fiscal year 2021 funds will be used for the maturation of requirements analysis to draft a Capabilities Development Document, develop a new LSC land-based technology development plan, and initiate a collaborative government and industry effort necessary to develop the LSC preliminary design.

The Navy partnership with industry will include both design and shipbuilding contributors driving to a stable requirements baseline, and a ship that will have been designed for producibility as well as flexibility.

SMALL SURFACE COMBATANTS

Reemergence of a Great Power Competition and the pivot to the Indo-Pacific requires a more capable Small Surface Combatant for operations in contested environments. FFG(X) is the evolution of a ship design with increased lethality, survivability, and improved capability to support the National Defense Strategy across the full range of military operations as part of a more lethal Joint Force. FFG(X) Capability Requirements are mature and reflect the needs to support the National Defense Strategy's "Blunt" and "Contact" layers to deny adversary aggression and manage conflict escalation in our global operating model. Existing Fleet requirements and detailed analysis have been refined through early engagement with industry in a collaborative Conceptual Design process that completed in June 2019. The FFG(X) program is managing development risk by combining proven ship designs with mature, best-of-breed Government Furnished Equipment designated combat system elements. The Navy is confident in the capability FFG(X) will deliver to the Fleet. FFG(X) is in a full and open competition source selection for the Detail Design and Construction Contract, which ensures competitive pricing and drives best value capability. Contract award is expected by the end of fiscal year 2020. The fiscal year 2021 budget procures the second ship of the class and continues RDT&E efforts to deliver critical warfighting capability to the Fleet on time. This supports the steady profile growth of the program, which will see increased annual procurement starting in fiscal year 2023.

The Littoral Combat Ship (LCS) program has delivered 21 of the 35 total planned ships. The program plan for these ships is: four dedicated test ships; eight Surface Warfare (SUW) ships; eight Anti-Submarine Warfare (ASW) ships; and 15 Mine Countermeasure ships. The initial four ships designated as test assets will complete testing and decommission by the end of fiscal year 2021. The Navy is beginning to backfit an Over the Horizon Weapon System (OTH WS) on all LCSs for increased lethality. The award in May 2018 of the Naval Strike Missile contract for OTH WS brings a technologically mature weapons system and extends the offensive capability of the ship. Starting with the deployment of USS *Montgomery* (LCS 8) in June 2019, a total of nine LCS will have completed their inaugural deployments to 7th, 5th or 4th Fleet by the end of fiscal year 2021, providing a significant increase in contact layer assets for Fleet Commanders which will continue to grow as the remaining ships are delivered to the Fleet.

AMPHIBIOUS SHIPS

Amphibious warfare ships are a cornerstone of the Nation's global forward presence. They continue to play a pivotal role in responding to world crisis and supporting a broad range of missions across the spectrum of conflict. Today, these ships are persistently forward deployed, competing below the level of armed conflict while living within the range of enemy fires, building partner capacity, and deterring enemy aggression. Partnered with industry we are committed to delivering the most capable multi-mission amphibious warfare ship on the planet.

America-class (LHA 6) will replace the decommissioning LHA 1 Tarawa and aging LHD 1 *Wasp*-class ships. USS *America* (LHA 6) recently deployed as the centerpiece of the America Amphibious Readiness Group/Marine Expeditionary Unit with the F 35B operating from the flight deck. USS *Tripoli* (LHA 7) delivered on February 28, 2020. The ship will focus on moving the crew aboard and prepare for commissioning and sail away later this year. Fabrication has begun on LHA 8, with 26 units erected that will support a fiscal year 2024 delivery. LHA 8 will include a well deck to increase operational flexibility and includes a reduced island structure that increases flight deck space to enhance aviation capability. All LHAs will be F-35B capable.

San Antonio-class (LPD 17) provides the ability to embark, transport, and land elements of a landing force by helicopters, tilt rotor aircraft, landing craft, and amphibious vehicles. The LPD 28 is 65 percent complete and planned for delivery in September 2021, while the LPD 29 is 25 percent complete and planned for delivery in the fourth quarter of fiscal year 2023. LPD 28 and LPD 29 leveraged many design innovations and cost reduction initiatives, including the first install of the Enterprise Air Surveillance Radar (EASR) on LPD 29, as the class transitions to Flight II, integrating more high-level capabilities. The Navy awarded the first Flight II ship, LPD 30, in March of 2019 with a planned delivery in the second quarter of fiscal year 2025. Additionally, the Navy intends to place LPD 31 on contract by fall of 2020. The future amphibious force structure and composition are being evaluated as part of the larger ongoing Integrated Naval Force Structure Assessment.

LIGHT AMPHIBIOUS WARSHIPS

In support of tasks within the range of military operations, which includes Littoral Operations in a Contested Environment (LOCE) and Expeditionary Advanced Base Operations (EABO), the Navy will commence with Concept Studies to evaluate the next generation medium lift intra-theater amphibious platforms and logistics ships. These studies will primarily focus on commercial designs tailored for military application to enable maneuver, mobility and naval sustainment (Refuel, Resupply, and Rearming) for our integrated naval forces conducting distributed maritime operations.

CONNECTORS

The Ship to Shore Connector (SSC) program provides the capability to rapidly project assault forces within the littoral operational environment to accomplish Unified Campaign Plan missions and ensures the Joint Force Commander's ability to conduct amphibious operations maneuvering over-the-beach, over ice, mud, rivers, swamps and marshes. The Landing Craft, Air Cushion (LCAC) 100 class craft are the functional replacement for the legacy LCAC craft, which began reaching end of their service life extensions 2015. The Department remains committed to maintaining this critical non-displacement craft capability with the LCAC extended SLEP (E-SLEP) initiative and the SSC program despite its recent developmental setbacks and commensurate reductions in procurement quantities in fiscal year 2020 and fiscal year 2021. The Navy continues to work with our industry partners on a joint technical assessment to remediate issues discovered in the September 2019 Builders Trials. The fiscal year 2021 budget request reallocates funding from the SSC program to E-SLEP to improve and upgrade these versatile platforms, and ensure the connection between the combat power and logistics sustainment of the sea bases to the expeditionary forces. The Navy is also replacing its aging Landing Craft Utility fleet in the LCU 1700 program which will restore LCU's complementary heavy lift payload in a more rugged, reliable, and affordable independent operations capable non-displacement platform.

AUXILIARY SHIPS, EXPEDITIONARY, AND OTHER VESSELS

Expeditionary support vessels are highly flexible platforms that are used across a broad range of military operations supporting multiple operational phases. The Expeditionary Sea Base (ESB) is part of the critical access infrastructure that supports the deployment of forces and supplies to provide prepositioned equipment and sustainment with flexible distribution. The Navy took delivery of the USNS Miguel Keith (ESB 5) in November 2019. The ESB 6 and ESB 7 Fixed Price Incentive contract was awarded in August 2019 with planned deliveries in fiscal year 2022 and fiscal year 2023. The Expeditionary Fast Transport (EPF) program provides high speed, shallow draft transportation capability to support the intra-theater maneuver of personnel, supplies and equipment for the Navy, Marine Corps, and Army. EPF 11 delivered in December 2019. EPF 12 and EPF 13 are under construction with deliveries planned in fiscal year 2020 and fiscal year 2021, and EPF 13 and EPF 14 awarded in March 2019. An enhanced medical capability in support of Distributed Maritime Operations is planned for EPF 14.

The Combat Logistics Force (CLF) consists of T-AOE fast combat support ships, T-AKE dry cargo and ammunition ships, and T-AO fleet replenishment oilers. CLF ships fulfill the vital role of providing underway replenishment of fuel, food, repair parts, ammunition and equipment to forward-deployed ships and embarked aircraft, to enable them to operate for extended periods at sea. The *Kaiser*-class (T-AO 187) fleet replenishment oilers will be replaced with the *John Lewis*-class fleet replenishment oilers, designated T-AO 205 class. T-AO 205 is 76 percent complete and planned for delivery in June of 2021. The two follow-on ships of the class, are 32 and 19 percent complete, respectively.

The Department began construction this fall on the Navajo, a combined towing, salvage, and rescue (T-ATS) ship. T-ATS is based on existing commercial towing offshore support vessel design, and will provide ocean-going tug, salvage, and rescue capabilities to support Fleet operations. The Navy will exercise contract options for the 2 fiscal year 2020 ships later this year, and the fiscal year 2021 budget request increases T-ATS procurement for a total of two ships.

STRATEGIC SEALIFT

The Navy has begun the first steps in executing its sealift recapitalization plan called Sealift that the Nation Needs. This three-phased approach includes the Service Life Extensions of select Surge Sealift vessels, acquiring used vessels, and a new

construction shipbuilding program. The Navy's long-term strategy recommends assigning new construction common hull vessels to the Maritime Prepositioning Force (MPF) as delivered, ensuring the Fleet has the latest capabilities to support employment across the full range of military operations. Existing MPF ships would rotate to surge, preserving capability and maintaining the requisite square footage to meet USTRANSCOM sealift capacity requirements. The fiscal year 2021 budget request increases resources for operations and sustainment to improve current readiness, maintains service life extensions, increases used vessel acquisition for a total of two in fiscal year 2021, and maintains investments for new construction sealift industry studies and preliminary design of the flagship T-AKR(X) Strategic Sealift vessel.

SUSTAINMENT, MODERNIZATION AND SERVICE LIFE EXTENSIONS

The Navy has undertaken a multipronged approach focused on increasing accountability and improving productivity in both public and private shipyards. In our public yards, the Navy is growing the capacity of the shipyards to meet the workload demand, improving the training and productivity of the workforce, and making the needed investments in our shipyards to ensure they can support our growing needs. In the private shipyards, the Navy has focused on improving the completeness, accuracy, and timeliness of planning; working with the Fleet to adjust maintenance schedules to level load the ports, revising acquisition strategies to improve stability and predictability, and streamlining Navy inspection points to improve efficiencies.

The fiscal realities facing the Navy make it imperative to maintain our in-service ships to achieve their expected service lives and maintain their relevant combat systems through modernization efforts. The Fiscal Year 2021 President's Budget includes funding for the modernization of three destroyers to sustain combat effectiveness, ensure mission relevancy, and achieve the full expected service lives of the AEGIS Fleet. Service life extensions can be targeted, physical changes to specific hulls to gain a few more years, or a class-wide extension based on engineering analysis. The Navy has evaluated the most effective balance between costs and capability to be removing the service life extension on the DDG 51 class; extending the services life of the most capable ships in the cruiser fleet while removing the four cruisers that have the least effective ballistic missile capability; and delaying the accelerated retirement plan for the mine countermeasure ships by one year.

SHIPYARD INFRASTRUCTURE OPTIMIZATION PLAN (SIOP)

Maintaining and improving public and private ship repair infrastructure capacity is essential to conducting required maintenance of a growing Navy. Planned Naval Shipyard investments and completion of Naval Shipyard optimization analysis are a necessary step to improve public shipyard productivity and performance. The Navy is outlining a strategy for the optimal placement of facilities and major equipment at each public shipyard, including a 20-year investment plan for infrastructure to ensure we can continue to support the world's finest naval force now and into the future. The plan focuses on three major areas for each of the Navy's four public shipyards: dry dock recapitalization; facility layout and optimization; and capital equipment modernization.

Phase II of the SIOP is well underway with the development of the shipyard digital twins, the commencement of requisite facility engineering studies and the environmental planning activities at Pearl Harbor Naval Shipyard. The Area Development Plans (ADP) for the four public shipyards are scheduled to be completed in fiscal year 2022, with the program moving into the execution of the SIOP upon completion. Concurrent with the ADP effort, SIOP is moving forward with fact-of-life dry dock projects and other facility and capital equipment investments required in meeting the demands of the Navy's Fleet Commanders. The SIOP is also rapidly developing a first-of-its-kind Dry Dock Production Facility for Pearl Harbor to demonstrate the efficiencies that will be gained by moving the work closer to the ship in a state-of-the-art industrial facility. These efforts represent a substantial capital investment to ensure that America's shipyards will continue to keep our Navy in peak fighting condition for decades to come.

UNMANNED SURFACE AND UNDERSEA VEHICLES

Unmanned systems continue to advance in development and will be key enablers through all phases of warfare and in all warfare domains. The Navy is using a Family of Systems strategy to develop and employ unmanned surface and undersea capabilities that augment and relieve stress on the manned force, and increase the cost imposed on our competitors.

This year in the surface domain the Navy will commence low-rate production of a modular Mine Countermeasures Unmanned Surface Vehicle; award a contract for the first prototype medium unmanned surface vehicle (MUSV) to provide distributed sensing capacity to the surface force; continue evaluation of the Marine Corps' long range unmanned surface vessel (LRUSV); and award large unmanned surface vessel (LUSV) conceptual design contracts while continuing to mature and demonstrate the necessary technologies leading to a unmanned capability to provide distributed lethality as a part of the Future Surface Combatant Force. Additionally, the Navy will award a Multi Award Contract Indefinite Delivery/Indefinite Quantity to provide the key enabling technologies for the unmanned surface Family of Systems.

In the undersea domain, the Navy has commenced fabrication of Orca Extra Large Unmanned Undersea Vehicle (XLUUV). Competitive RFPs will be issued in fiscal year 2020 for initial production of Snakehead, the Large Displacement UUV, and for production of a Medium UUV that supports both the submarine launched Razorback environmental sensing mission, as well as the Maritime Expeditionary Mine Countermeasures UUVs mission.

In support of these new capabilities, the Navy is also investing in enabling technologies, such as autonomy, command and control, energy, and payloads, as well as establishing the interoperable standards and open architectures for ease of technology transition. These technologies and standards are the foundation necessary to ensure integration and transition to the fleet using a disciplined approach.

The Navy has undertaken an aggressive approach through competitive prototyping in collaboration with industry to accelerate these new technologies utilizing the new authorities granted by Congress over the past few years, such as middle-tier acquisitions and acquisition agility legislation. This affords the Navy the ability to prudently prototype, experiment, and demonstrate new capabilities prior to commencing with Programs of Record. Unmanned vessels are key elements in the future naval force and the Navy fully intends to leverage the progress to inform new concepts of operation, new means of integrating unmanned and manned vessels, and new capabilities afforded by these advances.

COMBAT SYSTEMS

The Department continues to field the most capable and lethal surface and submarine combat systems in the world. AEGIS combat system capability continually evolves to deliver additional warfighter improvements to the AEGIS Fleet. AEGIS Combat System Baseline 9 delivers unprecedented offensive and defensive capabilities, including offensive strike and ASW, and simultaneous air and ballistic missile defense on destroyers and Air Defense Commander capability on cruisers. AEGIS Baseline 10 will incorporate the AN/SPY 6(V)1 Air and Missile Defense Radar (AMDR) for DDG 51 FLT III ships providing significant performance improvements over the AN/SPY 1D(V) radar and expanding the sensor coverage and enhancing the Navy's ability to perform the Integrated Air and Missile Defense mission.

Utilizing open architecture that takes full advantage of evolving technology to rapidly deliver real-time, reliable, and actionable information to the warfighter, the Department continues working towards breaking the paradigm of hardware-software dependent deliveries. Using virtualization technology, the AEGIS virtual twin system, a prototype of the AEGIS Virtual Combat Management System, is able to run AEGIS Weapon System code in a fraction of the original hardware space. The AEGIS virtual twin successfully executed its first live-fire engagement this past year. Additionally, the Navy successfully tested the Virtual Laboratory on Ship (VLOS), a virtualized Undersea Warfare Combat System (AN/SQQ-89 A(V)15), during a weeklong underway period. VLOS represents another important step forward in the Navy's efforts to speed combat system element development and software upgrades.

The Department continues to aggressively pursue affordable systems that are employable from multiple platforms. Leveraging the investment in AMDR, scaled variants of the AN/SPY-6(V) are planned to replace the AN/SPY-1 radar on select existing DDG 51 FLT IIA ships to become the primary Air Search Radar for carriers, amphibious ships and the guided missile frigate (i.e. EASR). The use of a common core technology and support strategy enables significant life cycle efficiencies in maintenance support, training, and overall cost for the Navy's primary surface ship radars.

The Navy continued to equip its submarines with the ever-evolving undersea combat system utilizing bi-annual hardware Technology Insertions on even years and software Advanced Processing Builds on odd years. This process leverages commercial off-the-shelf (COTS) technologies via the Acoustic Rapid COTS Insertion pro-

gram mitigating COTS obsolescence while providing more capability improvement at lower costs.

MISSILE PROGRAMS

SM-6 missiles provide theater and high value target area defense for the Fleet, and with Integrated Fire Control, has more than doubled its range in the counter-air mission. SM-6 Block I declared Full Operational Capability in December 2017 and SM-6 Block IA successfully achieved IOC in October 2019. The Navy awarded a five-year MYP contract for up to 625 SM-6 missiles in December 2019. The fiscal year 2021 President's budget continues funding for the upgraded SM-2 Block IIIC and the SM-6 Block IB missiles as rapid prototyping pathway middle tier acquisition projects. SM-2 Block IIIC leverages investments made in SM-6 Block I and Evolved Sea Sparrow Missile (ESSM) Block II to enhance performance against numerous threats and to increase depth of fire. The SM-6 Block IB seeks to provide an extended range capability in response to Joint, Fleet and Navy Urgent Operational Needs by integrating a new government developed rocket motor onto an existing SM-6 Block 1A seeker.

ESSM provides another layer to the Navy's defensive battle-space. ESSM Block 2 is on track to achieve IOC for AEGIS platforms in fiscal year 2020 and Ship Self-Defense System platforms in the 2022-2023 timeframe.

The inner layer of the Fleet's layered defense is the Rolling Airframe Missile (RAM) designed to pace the evolving anti-ship cruise missile threat and improve performance against complex engagement scenarios.

DIRECTED ENERGY

In fiscal year 2020, the Navy provided Congress its path forward for shipboard integration of High Energy Laser (HEL) systems and the risk reduction plan to continue to improve technology while growing the industrial base for these systems. Initial capabilities, such as Solid State Laser—Technology Maturation (SSL-TM) on USS *Portland* (LPD-27), have been fielded for shipboard experimentation and integration. This type of operational experimentation is valuable for the Navy's long term consideration of other ship classes as host platforms for laser weapons. In the fiscal year 2021 budget request, the Department will continue advancing capabilities of laser weapons to meet ship defense missions. The Department is also collaborating and partnering with OSD and other Services to mature these advance technologies to defeat more challenging threats and shape future acquisition of these systems.

GROUND-BASED LONG-RANGE PRECISION FIRES

The Marine Corps' highest ground modernization priority, a Ground-Based Anti-Surface Missile (GBASM) capability, will provide anti-ship fires from land as part of an integrated Naval Anti-Surface Warfare campaign. This forward-deployed and survivable capability will enhance the lethality of our naval forces and will help to deny our adversaries the use of key maritime terrain.

The Marine Corps' GBASM solution is the Navy Marine Expeditionary Ship Interdiction System (NMESIS), consisting of an unmanned Joint Light Tactical Vehicle-based mobile launch platform, called the Remotely Operated Ground Unit for Expeditionary Fires (ROGUE-Fires), and Naval Strike Missiles (NSM). The NSM is identical to the Navy's Over the Horizon Weapon System deployed on the Littoral Combat Ship and will provide the Marine Corps with a missile capable of sea-skimming, high-g maneuverability, and the ability to engage targets from the side, rather than top-down. This maximizes lethality and missile survivability. Enhancements made to the High Mobility Artillery Rocket System and the development of the Ground Launched Cruise Missile will further strengthen the capabilities of the entire naval fires enterprise.

Senator PERDUE. Thank you, Secretary Geurts.

Again, I am going to remind the people that just walked in we have a call vote at 10:30, and the ranking member and I have agreed with the witnesses to take a 10-minute recess at 10:30, run and vote, come back. That way everybody can choose their schedule accordingly.

I am just going to ask a couple questions to start with. Thank you for that brief and very comprehensive summary.

As I mentioned in my opening statement, Section 231 of Title 10, U.S. Code requires the Secretary of Defense to submit a 30-year shipbuilding plan with the annual budget materials submitted to Congress.

You know, let me put a little perspective on this. I recognize the challenge that DOD is in. You are in a period of time where you are focused on readiness, recapitalization, and also rationalization. You have the first audit in the history of the DOD. We are finding money that has been going into obsolete programs now getting reprogrammed. I respect that and I thank you guys because I know all of you have been involved in that.

Secretary Geurts, what is the status of the shipbuilding plan and that perspective and when should we expect to receive it?

Secretary GEURTS. Yes, sir. So as the Secretary of Defense has talked about in testimony and follow-up communications with Congress, he is committed to a battle force of at least 355 ships.

Senator PERDUE. Which for the record, if I remember the numbers, is about \$28 billion a year to get there. Right per year?

Secretary GEURTS. Yes, sir. It depends on the kind of makeup of the fleet.

I think in a positive, we are seeing great interest by the Secretary of Defense and the Deputy Secretary of Defense in recognizing the importance of the maritime strategy and making sure that we have got a strategy that he is comfortable with that enables us to achieve, as best we can within resources, the outcomes to the challenges you outlined. There is no doubt there are plenty of challenges.

We are working with his staff. He, as he has indicated to Congress, will release it when he is comfortable with that level of analysis. I cannot communicate exactly when that will be. I can just tell you we are having healthy dialogue. Again, in a positive, he wants to make sure he has put his own eyes on it and that we have leveraged all the thinking within the Department given the criticality of that shipbuilding plan.

What I would also say is in any shipbuilding efforts we have done, in all our studies, and our sense of the different courses you could take in the shipbuilding plan, all of that rests solely on the foundation of our 2021 budget. We are committed—again, we had to make some hard choices. But our 2021 program is not at risk of any of those. It is really how are we going to address the gaps you have put on it—

Senator PERDUE. Let me address that. First of all, I am not going to shoot the messenger, but the Secretary of Defense is here this afternoon and that response that he will get it to us when he is ready is unacceptable. We have a due date. You do not allow your soldiers and marines and sailors to do that. We cannot allow that here. It is a law, and so we are going to have that conversation later. We understand where that plan is, but it should be here.

I want you to comment on this graph and talk about the delta and how we get there. To get to 355—and we are now backing up from that it sounds like—is \$28 billion a year. Now we are back into like a \$20 billion plan for shipbuilding, and 25 percent of that, as I understand it, is for the nuclear capability triad, the commit-

ment that has been put up as the top priority. So that really begins to handcuff what you are able to do.

Are these numbers accurate? I mean, I know the numbers are accurate, but do you support directionally that China has this sort of building advantage? They already have an advantage today. They are at 350 versus our 295, as we sit here today.

Secretary GEURTS. Yes, sir. I would certainly say our pacing threat from China is their ability to scale and produce, leveraging their very strong commercial marketplace. A number of the efforts that we, I think, have worked and need to continue to work is: how do we bolster the industrial base for shipbuilding across the country? I would—

Senator PERDUE. Sorry to interrupt, but I would argue that—I have got just a second or 2 left. I would submit that the Chinese have already recognized this delta here, and they do not see us doing anything about it. That is why they put out their Made in China 2025. They never tell you what they are going to do unless they have decided that you do not have the wherewithal or the will to stop them. They are looking at this. By the way, you have to divide our numbers by two roughly because we are committed to resources in the other half of the world besides the Indo-Pacific. So our combatant commanders in the Pacific are very aware of this.

My question to the Navy is what is the answer. Tell us what you need. Let us figure it out, but we have got to get to an answer. It cannot just be, well, we will submit a plan when we are comfortable with it because there is no plan here that anybody is going to be comfortable with until we figure out how to close this delta.

Secretary GEURTS. Yes, sir. We will continue, I would suspect, in the dialogue here at the Subcommittee, and we will bring in how are we creating competitive strategies, betting integrating the Marine Corps and the Navy, and then better acquisition outcomes for the dollars we have, how do we deliver the right ships at the right time with high levels of confidence. We are in that pivot period now. Congress has given lots of good tools. The SHIPS Implementation Act provides some additional tools, which will be extremely beneficial. We look forward to working with you on—it is going to take us working together to close that gap.

Senator PERDUE. Well, we are committed to do that. What I am asking is tell us what you need. Let us wrestle with what the realities are. But we cannot just bury our heads about this chart.

Secretary GEURTS. Yes, sir. Business as usual will not get us to close that gap.

Senator PERDUE. We recognize what you are up against.

Senator HIRONO?

Senator HIRONO. Thank you.

Well, Secretary Geurts, whenever you come and testify, you continue to reassure us, and as the chair said, we do not want to shoot the messenger. But it is very clear that Congress has an intention to move us to a 355-ship Navy, and that is not where we are heading. We get all of these I do not know what, you know, explanations, you are making things a lot more efficient, your acquisition program, et cetera. But we are still not told how we are going to get to 355 ships. So that is the thing. You see it is very frustrating for us to sit here and go through this year after year.

Okay. So I want to focus again on modernizing the public shipyards because even as we get to a 355-ship Navy, most of us have talked about how important it is to maintain what we already have. If our shipyards do not have the kind of modernized situations, including for Hawaii, you know, we need a new dry dock, we need a production facility because our workers there have to travel—they have to go all over the place to get the parts that they need to repair the submarines and everything else. We need a production facility. That was taken out of the—the one that was the planned was taken out of the budget, and the hope is that the new one is going to be built at the same time frame as the previous one was going to be built.

So I want to know if the fiscal year 2021 budget fully funds the shipyard modernization plan. That goes for all four shipyards. All of the shipyards are in this together. I am not just talking about the Pearl Harbor Shipyard. I am talking about all the other three shipyards. We all need to be going together. So is there money in the fiscal year 2021 budget to fully fund the modernization plan?

Secretary GEURTS. Yes, Senator Hirono. In fiscal year 2021, we have got roughly half a billion dollars, \$448 million specifically, towards that shipyard optimization plan. That is a combination of military construction, recapitalizing equipment, and then working on our planning for the future. The Navy is committed to recapitalizing the shipyards.

We started first by bringing on the workforce we needed, and that workforce is doing a tremendous job. We are at about 36,000, north of that, workers. We brought them on earlier than—

Senator HIRONO. Oh, Mr. Secretary. So the question is, if the modernization plan is being fully funded. The amount that you are telling me—does that fully fund the modernization program going forward from fiscal year 2021—for fiscal year 2021?

Secretary GEURTS. Yes, Senator Hirono. For the requirements we have right now, it fully funds us. We have a large program to come, but for 2021 that is fully funded.

Senator HIRONO. All right.

Are you considering any changes to the plan to accelerate specific capability expansion or specific productivity enhancements in view of the ship maintenance problems you are facing?

Secretary GEURTS. So as we build—as you know, we are building digital models of all the shipyards to identify where the biggest bang for the buck is in terms of how do we get more efficient with the workforce we have in place. As those studies and area plans come together, we will look to accelerate where we get the biggest return on those investments while understanding we have some large capital projects, dry dock replacements we are going to have to do as well.

Senator HIRONO. So it might be instructive for us to know specifically what kind of things that you are doing to expand your capability, the capability at our shipyards. I mean, it is one thing to be told verbally, but I would like to know specifically. So what have you done? To me having a production facility, that is a very concrete way to effect efficiencies.

Secretary GEURTS. Yes, ma'am. If I can just kind of walk around the world—

Senator HIRONO. Not today.

Secretary GEURTS. Yes, ma'am. We are happy to go in whatever level of detail you like.

Senator HIRONO. Okay. For a number of years now, the Navy's long-term goal for fleet size was a 308-ship fleet, and after publication of the CNO's last Force Structure Assessment, the goal was reset to 355 ships. Of course, we are very much on it because we have to put that number into the law, and I can thank the former chair of this Committee for making sure that that is in the law.

The chair has already mentioned that we do not have the information we need. The plan that was supposed to be submitted to us is not before us, and we would like to know what you all have in mind. So I just want to add my concern to that expressed by the chair, that we need the reports that should be coming to us.

So I indicated in my opening statement the Navy recently signed a multi-year procurement contract for block 5 of the *Virginia*-class attack submarine, and there is an option to buy a 10th boat if the Navy has the resources and if the contractors improve performance on the program. I think you get that we are very concerned about only one submarine being produced. So I am concerned that the window of opportunity for exercising the option to buy a 10th boat may pass, but I am also concerned about what criteria the Navy would use to award the 10th boat if additional funds were provided.

So my question to you is, Secretary Geurts, if Congress were to authorize a second *Virginia*-class boat in fiscal year 2021, what criteria would you use to decide whether the contractor team that is currently in place has earned an award for the 10th boat?

Secretary GEURTS. Yes, ma'am. When we talked previously, I was concerned about execution, and I was concerned about putting *Columbia* at risk, which is our highest priority. Since that time, the company and the program has showed much improved performance. At this point, it is not an execution issue for me. It is a pure affordability issue. If the funds were there, I would have no reservation with putting those funds on contract and adding that 10th ship to the multi-year. So at this point, it is not a criteria to add it other than a pure affordability issue, which is why we had it number one on our unfunded priority list.

Senator HIRONO. Thank you.

Thank you, Mr. Chairman.

Senator PERDUE. With the witnesses' forbearance, we are going to declare a 10-minute recess, go vote. Before we do that, I want to thank Senator Kaine and Senator Shaheen for their steadfast support of this Subcommittee. They are always here. They are always interested and always involved. Thank you guys for being here.

[Recess.]

Senator PERDUE. We will call the Subcommittee hearing back into session.

Senator Kaine and Senator Shaheen are on the way back. While we are waiting on them, I will ask Senator Hirono if she wants to ask her next question, and then we will go to one of the other Senators when they come back just to keep our momentum going here. Senator Hirono?

Senator HIRONO. Mr. Secretary, there have been some problems with production of the ship-to-shore connector, or SSC, program. This is a program that will replace our landing craft air cushion, or LCAC, that transport equipment and supplies ashore. I see that you have chosen not to request any production for the SSC program in fiscal year 2021. Can you give us a status report on this program?

Secretary GEURTS. Yes, ma'am. We have been working with the contractor there. We had had some delays in developmental testing. We worked our way through most of those and feel pretty comfortable now with the vehicle itself. Then we had a number of vehicles that we had not gotten into production in a timely fashion. So we are committed to the program. The fiscal year 2021 quantity just reflects the fact that we were a little further behind in production than we had anticipated, and now that we have negotiated that contract, which we will put on contract here in the next month or so, that will allow us to continue to get into production and then set us up well for increasing production as we get into 2022.

Senator HIRONO. So you will request some money for 2022.

Based on what you are having to do often, it is clear that you have to work directly with the contractors not just in this case but with a *Virginia*-class submarine contractor. So you have people on your team that can do this, to be able to perceive problems before they occur with the pace or anything else with the quality so that they can get in there and work with the contractor so that we are not adding time and money to the production?

Secretary GEURTS. Absolutely, ma'am. So I am very proud of the Department of the Navy team. We have a high level of technical competence. We work closely with the contractor. It is a shared risk-shared reward. In some cases, we will bring government equipment on there if we can do that more effectively. But both in the case of the ship-to-shore connector, *Virginia*, all the others, we work very closely with the contractor and we make reality-based decisions.

So I am not going to continue producing something that is not ready to produce. We made some hard decisions in this budget in Triton and a couple other programs where we were not where we needed to be. What I do not want to do is double down on the risk and create more concurrency. I would rather, as we did in 53-K, stop, get the program on the right footing, and then execute smartly on that program.

Senator HIRONO. As you are dealing directly with the contractors, do a number of them talk about how hard it is for the suppliers? Because we have a decreasing number of suppliers for all the parts that they need. Is that an aspect of what you are addressing somewhere along the line?

Secretary GEURTS. Absolutely, and in many cases because a prime contractor cannot see all the rates at a subcontractor, we will actually negotiate some of those facets with the subcontractors to try and drive costs down.

I would say one of my largest concerns—we talk industrial base at final assembly, which is an important issue such as shipyards or an aircraft production. Industrial base at the supplier is even more critical. I have hired a full-time supply chain expert, and we

have created a whole supply chain set of expertise across all of our programs. To Senator Perdue's observation, on China, they are also competing with us and against us in many of the supply chain areas. Supply chain integrity—really understanding that supply chain, what it costs, where we have fragility, where we have opportunity is a critical thing we have been focused on for the last 2 years or so. We are starting to see that really add benefit to us.

Senator HIRONO. I am glad you are doing that and I commend you for it because, as we talk about our contractors, we sometimes forget that there are thousands of people in the supply chain that need to be supported also.

Secretary GEURTS. I can just follow up just briefly to that point. For an aircraft carrier, we have about 10,000 folks, great folks down at Newport News on aircraft carrier construction, RCOH. For that program alone, we have 2,000 suppliers of over 50,000 people in 46 States. We need both to be balanced. What Congress has done to bolster supply base last year on DDG-51—there was money for that and on the submarine programs and on the carrier programs—has been critical so that we are not caught in single-point failures or areas where we cannot scale supply base at the same rate we are trying to scale the larger program.

Senator HIRONO. Thank you.

I do have one short question for Admiral Kilby. The *Aegis* destroyers and attack submarines represented the largest inventory shortfall compared to the goals in the 2016 Force Structure Assessment, with the actual Navy fleet 15 boats below the attack submarine goal and 14 destroyers below the goal for large surface combatants. Admiral Kilby, is there any chance that the demand for these two types of ships will go down in the new force structure assessment?

Vice Admiral KILBY. Ma'am, I see a need for both those classes of ships. As we work through this with the Department of Defense (DOD), I think quantities could change on the margins, but by and large, it will be consistent with past force structure assessments in my belief.

Senator HIRONO. Thank you.

Thank you, Mr. Chair.

Senator PERDUE. Senator Kaine?

Senator KAINE. Thank you, Mr. Chair, and to the Chair and Ranking, we participate in this Committee, as Senator Shaheen said, because we are assigned because we have vested interests, but you guys run a good committee and these are important witnesses to have.

I want to thank Senator Hirono. She hosted me at the Pearl Harbor Shipyard 2 weeks ago. It is really good to see the shipyards other than those in Virginia because you get a sense of the extent of the need and the challenge you have.

Secretary Geurts, I have a lot of questions, but in 5 minutes, I will do a couple of things.

You at DOD were ordered to do reprogramming to put money in the counter-drug account that would then be used for wall construction, and I want to focus on that a little bit. I think all of us would highly prefer that the money we give to the DOD stays in the DOD account, is not used for a non-military emergency, and

then we battle it out and reach an accord on what the wall and money should be. I do not like using the DOD's budget as the piggy bank.

My understanding is in that reprogramming what the Navy did in the shipbuilding seapower space was basically took \$911 million out of one LHA amphibious ship and an expeditionary fast transport. Explain the decision-making behind, if we have to reprogram, why I am going to take out the LHA and why I am going to take out the expeditionary fast transport.

Secretary GEURTS. Yes, sir. Obviously, those were decisions made at the SECDEF level. He has got a site picture larger than just the Navy site picture on priorities in importance.

In the case of the LHA, we value that ship greatly. We actually in the 2021 budget accelerated that from an fiscal year 2024 construction to fiscal year 2023. Congress had appropriated money and given us incremental funding authority relatively early to that need. Our challenge in the future budgets will be to place that money back in the program so we can deliver that LHA.

Senator KAINE. Just before we get to the expeditionary fast transport, the LHA is a platform that has high utility for marines. Right? I am often in a hearing like this saying on shipbuilding and ship repair, the Navy and Marines are like in the same place. Are they not? We are not leaning too far one way or too far the other. But that is a platform that has very high utility for marine use.

Secretary GEURTS. Yes, sir. Maybe I will ask General Smith to give his perspective.

Lieutenant General SMITH. Thanks, Senator. Your first comment about are we tied leaning one way or another, I would say that the cooperation and collaboration on the naval team is as good as it has ever been. Jim Kilby and I literally do not walk down the hall without checking with what each other is doing.

LHA-9—any LHA—the ability to project power forward, the ability to carry the F-35B has been extremely importantly demonstrated a couple of times here in the last few years with the 13th Marine Expeditionary Unit, Colonel Chad Nelms, and the 31st Marine Expeditionary Unit, Colonel Bob Brody. We put multiple F-35B's on those platforms. That does get the attention of the pacing threat.

We are committed to the LHA-9, and the Navy has been, as part of the naval team, very, very clear that that is a priority because that supports the fleet commander. The Marines do not operate independently. We operate in support of fleet commanders.

I have every confidence that that funding gets restored and that we move forward on LHA-9. As the Secretary said, the Navy has accelerated from 2024 to 2023, and we will have to fund that in the out-years to get it on track to deliver that capability to the fleet commanders and the joint force commanders.

Senator KAINE. How about the expeditionary fast transport? Talk about that one a little.

Secretary GEURTS. Yes, sir. That was an additional ship to our requirement, and so I think when the Secretary of Defense—I am not going to speak for him. He had to make some hard decisions.

Senator KAINE. My assumption is he has got to make hard decisions, but he is not making them with no menu of recommenda-

tions. I mean, you would rather not have to reprogram any of those dollars, but you have to say, well, okay, if we are going to have to give up \$900 million or whatever it is, you make some recommendations.

Secretary GEURTS. Yes, sir. Our job is to identify the options that are out there and then put the context in there. The thing we will have to work through that we watch very closely is the industrial base. That one is going to be particularly challenging on the industrial base side, but we will work our way through that.

Senator KAINE. Mr. Chair, could I ask one more question. Actually I have about 30 seconds left.

Senator PERDUE. Yes.

Senator KAINE. I will try to make it quick.

I have heard some differing accounts, including today, of not including the second *Virginia* sub in this President's Budget. I have heard just straight out financial challenge, you know, resource constraints. I have heard we are more focused now, as we need to be on a long-term—and you have talked about this. We have had a long-term shipbuilding plan. We need to have a long-term ship maintenance plan, and we have enough maintenance needs for the ships that we have that maybe that starts to carve into some of the new contracts. I have also heard that maybe industry could not do two ships in a year. I am a little confused about what is the reason, and it could be more than one of those things. But could you enlighten me?

Secretary GEURTS. Yes, sir. As I have spoken about previously, I was concerned about the submarine industrial base to keep on a two *Virginia* cadence as we brought *Columbia* on.

Senator KAINE. Without *Columbia*, the two *Virginia* thing is fine. But you are adding payload modules—

Secretary GEURTS. Yes, sir. We are adding more complexity to each *Virginia*, and when we were struggling to get two *Virginias* out a year before we added the payload module on *Columbia*, I was concerned that we had the enterprise where it needed to be. What I did not want to do is get to the point where we could not, we had no outs, and we overloaded the yard and put *Columbia* at risk.

The company and the submarine team have worked very closely together. We restructured that multi-year program to get at those execution issues, and I would say confidently they have stemmed the tide from what I would say is eroding performance to being able to deliver now.

So from my perspective, it is not an execution issue, it is a pure affordability issue given all the other trades we have.

Senator KAINE. Thank you.

Thanks, Mr. Chair.

Senator PERDUE. Senator Wicker?

Senator WICKER. Well, thank you very much. I am delighted to be back in the Subcommittee room with a bunch of talented legislators who understand the need and also with these witnesses today.

As a matter of fact, I will tell Senator Kaine I toured the *Tripoli*, an LHA that is about to be underway, at Ingalls Shipbuilding in Pascagoula on Friday with the Chief of Naval Operations and his team. It is a thing of beauty down there, the things they are doing to increase productivity, to listen to the shipyard workers about

their ideas about efficiency, and rely on just centuries and centuries of collective experience there.

I do have to get these questions in, and so I want to be precise with them.

The budget request includes four amphibious ships in the future years defense program, three *San Antonio*-class LPDs, 31, 32, and 33, and the large deck ship, LHA-9, which Senator Kaine was talking about. I was pleased to see procurement of LHA-9 accelerated.

Last year, this Subcommittee asked the Navy to review alternative acquisition strategies for amphibious ships to leverage multiple ship contracts, which have saved billions of dollars and provided much needed industrial base stability, including for destroyers, submarines, and aircraft carriers. In this review, the Navy reported significant savings could be achieved by procuring various combinations of amphibious ships.

How important to the Marine Corps is it to maintain a stable industrial base for amphibious ship construction? This is for General Smith. Can you describe the importance of these four amphibious ships?

Then for Secretary Geurts, can you elaborate on the review that I just mentioned, as well as the Navy's findings particularly related to these three LPDs and the one LHA-9? If you can, speak to the timeline for awarding the funding of the ships. Would there be benefits of procuring these four ships together? Would the Navy support permissive legislative authorities that would enable such an approach?

Lieutenant General SMITH. Senator, so I will defer to the Secretary on the shipyards and the shipbuilding capacity although I am on my way to HII here in the next month or so. I had to cancel a trip there due to some scheduling conflicts, but I am on my way down there.

The import of those ships—the importance of those ships is vital to what we provide to the fleet. So when the Commandant talks about expeditionary advanced base operations, people will often confuse and forget that the best expeditionary advanced base is an amphibious warship that moves because while it may move 17 or 20 or 25 knots an hour, that is real capability and that is a real defensive capability. The importance of those four ships or of those amphibious warships, the traditional amphibious warships, is vital to what we are able to provide to the joint force commander as part of the joint force maritime component command that Admiral Kilby and I will do and fight together with. Highly important, sir.

Senator WICKER. Up to 3,000 troops at full capacity.

Lieutenant General SMITH. That is correct, sir. It is the melding of the kit, the equipment, and those fantastic marines that are on board, along with their sailors that are able to really project power and cause a dilemma for the adversary.

Senator WICKER. The F-35 lands right on it.

Lieutenant General SMITH. Absolutely, sir.

Senator WICKER. All right. Secretary?

Secretary GEURTS. Yes, sir. I think there is a tremendous potential, as we did in a report to Congress and as we have looked at it even further, to doing a block buy of the three LPDs and the LHA. We see that savings, you know, depending on exactly how we

do it, to be in the 8 to 12 percent range, which would be a billion dollars back of taxpayer savings, and so we are looking at that closely. We are also executing the advance procurement long lead funding that has been appropriated with the incremental authority. The things that I have seen in the draft of the SHIPS Implementation Act in terms of giving us more authorities to do smart procurement will be tremendously beneficial to us, and we will look forward to those authorities, should they come in the act.

Senator WICKER. Good.

Admiral Kilby, you have 8 seconds, but maybe you could take a little longer, to speak to the current inventory of destroyers. I believe we have roughly 67 DDG-51's. We need an extra two at Rota, Spain. Do we not?

Vice Admiral KILBY. Yes, sir. The combatant commander has asked for two destroyers to be moved to Rota, Spain. The Navy has acknowledged that and is considering that. We have a strategic lay-down process which vets where our ships go based on requirements from the combatant commanders.

But to your point, the DDG flight 3 is a ship we must have in the Navy because of its attendant radar, the air, the advanced missile defense radar is key to pace our adversaries, as Senator Perdue laid out earlier. That is a key combination for us in the future.

Senator WICKER. Thank you.

Thank you, Mr. Chair.

Senator PERDUE. Senator Shaheen?

Senator SHAHEEN. Thank you, Mr. Chairman.

Thank you all for being here and for your service.

I want to first go to the issue—and I apologize. I have missed some of the questions, but the issue that Senator Hirono raised in her opening statement about the importance of the shipyard optimization plan. With the Portsmouth Naval Shipyard of interest to both Senator King and me, we have seen very directly what those investments mean for the shipyard. Our workers there have what they call a declaration of excellence. I do not think there are any workers anywhere in the country that are any better than they are, but they have been held back by some of the investments. Now that those are being made, they are even more efficient than they have been in the past. There is a new paint blast and rubber facility that is going in that they are very pleased about because it is going to make them so much more efficient. The additional dry dock capacity is going to give us the capacity to get the subs back out into the ocean where we want them to be. I just want to underscore what Senator Hirono said about the importance of that plan and ensuring that we continue to make progress in making those investments.

Along those lines, I am not going to ask you to comment because I am going to raise this for Secretary Esper this afternoon. But the President's emergency declaration is taking \$3.8 billion from 2020 funds that are going for projects that the military and Congress have said we need and we want to—we have already signed off. I think there is some legal question about whether what the President has done is constitutional, and many of those systems that funding is being taken from are for the Air Force and the Army,

but certainly the P-8A Poseidon is one of those that is going to affect the Navy.

I just want to register the fact that I think this is a real problem. We have seen it last year and this year, and we have billions of dollars that are already sitting on the sidelines to build this wall that the President is committed to. So why he is taking this additional funding this year is beyond me. But I will leave that at that and ask if you could address the decision to reduce the procurement of the two *Virginia*-class subs. I know that several people have raised this. But as we think about our capability gap with Russia and China, that is the number one capability that we are looking for, and yet the Navy is only asking for one of those.

Secretary GEURTS. Yes, ma'am. To your first point, I do not know if you know, my dad went to sea on a submarine built at Portsmouth, on the John Adams. So he spent many years underwater thanks to the workers out there, and so it is near and dear to my personal heart, as well as with all the shipyards. Again, I did a groundbreaking at Norfolk. We did a groundbreaking last year there. I was just out at Pearl 3 weeks ago. It is a national treasure that we have got to preserve.

We have done a lot for the workforce. Now we have got to get the infrastructure where it needs to be, and we have a lot of funds laid in there at Portsmouth to go do that.

I am also—just a little bit of a side note—amazed at the innovation as we enable the workforce to have the resources to innovate on their own in the efficiency. Folks ask me if I am worried about our ability to keep up with the workload when we get back to 66 submarines. Not at all because we have got a very good junior in terms of how long they have been in the workforce—that means they are going to be there for a while. We just have to give them the right infrastructure and tools to go off and do amazing things.

The second *Virginia* to me is a pure affordability issue when we have had to balance everything we have got in there. As I had mentioned previously, it is no longer an execution issue in my mind. We have the capacity to do it. The changes that have been made, the partnerships, the new way of doing business we are seeing out of Electric Boat and Newport—they have proved they can do it and they are capable of doing it. Now to us it was just a pure affordability, which is why it was our number one unfunded priority. I would not have recommended to the CNO putting that on the list if I could not have executed it.

Senator SHAHEEN. Great. Well, hopefully we will get it funded.

I want to switch to another issue. But can you speak to what steps are being taken to ensure that the procurement for all future waterside security barriers complies with congressional language? As you know, we are looking at additional new innovation to address the security barriers for our ships when they are in port, and I wonder if you could speak to where we are in that process.

Secretary GEURTS. Let me get back to you with some exact details. I do not have those all here. I will assure you it is in our interest, one, to have the capability and, two, ensure that there is confidence we are doing it in compliance with all the regulations and best practices.

Senator SHAHEEN. Thank you.

Thank you, Mr. Chairman.

Senator PERDUE. Senator King?

Senator KING. Thank you, Mr. Chairman.

Secretary GEURTS. I want to quote the admiral sitting to your right. He said the flight 3 DDGs are a ship we must have. My concern, which will not be surprising to you, is that you have knocked out I think four ships in the future procurement, row K through 2022 on multi-year. My concern is a gap, and you take those ships out. We are talking about a new large surface combatant. We all know they take longer than we expect. Help me understand this decision because China is vastly expanding their fleet. The DDG is the workhorse of the Navy. The Pacific is a big ocean. Explain to me the decision to cut back on those DDGs.

Secretary GEURTS. Yes, sir. I will kind of give you mine from an overall perspective and invite Admiral Kilby to jump in.

I would agree with Admiral Kilby. If we are going to compete and win at a global scale, it is going to be on flight 3. DDGs are going to be a firm backbone for that.

With the multi-year engine 2022, two or three budget cycles ago, we kind of were moving quickly into a large surface combatant. If you notice in the budget, we have taken a little bit more strategic, I would say, pause on that in terms of making sure we have got all the things we need to do in prototyping and understanding of the detailed requirements before we transition into that.

I have not decided yet on what our contracting strategy would be for those destroyers after 2022, but my strong sense is that will be another multi-year procurement.

Senator KING. Multiyear will save the taxpayers—

Secretary GEURTS. While I have not formally declared that, I can see a scenario where we would not for the remaining destroyers, as we understand when the large surface combatant comes in play, we would not do a multi-year or some similar kind of arrangement. We do not want to get that transition point wrong. I think we need both capabilities, but we are not going to put the flight 3 destroyers at risk for the large surface combatants.

Senator KING. But you are proposing those cuts in flight 3. How come?

Secretary GEURTS. Right now it is, given the flat line budget and all the other pressures, we had to balance that risk.

Senator KING. But this does not affect this year's budget. Does it?

Secretary GEURTS. No, sir.

Senator KING. So we are talking about cutting ships in the future, and that is a future year budget.

Secretary GEURTS. Yes, sir. So in 2021, we have got two ships in 2021. We are executing the destroyer that was added. So I think we are good industrial base in 2021. The reductions were in the FYDP as we continue to look at how to balance all that with the resources available.

Senator KING. At that time.

Secretary GEURTS. At that time.

Senator KING. Well, those are decisions that will be made in the future.

Secretary GEURTS. Yes, sir.

Senator KING. Admiral, do you still want those flight 3's?

Vice Admiral KILBY. Yes, sir, I do. But I want to echo what Secretary Geurts said. When we put the budget together, we followed four priorities: *Columbia* first, readiness recovery, lethality, and then capabilities we could afford. So, we tried to balance those out and create the best program we could to meet those demand signals.

Senator KING. But I am sure you are aware there are industrial base issues. Continuity is critical here. I know both of the yards are gearing up, hiring people to meet the demands of the Navy. This is not something you can just turn off and on like a switch.

Secretary GEURTS. Absolutely, sir. Again, we are trying to be very thoughtful on the industrial base. We are going to have to work very closely. You know, as we get in a little bit later in the budget, *Columbia* will be, of the existing SCN, about 33 percent of it. If we fund all of *Columbia* within that SCN account—and so that is going to mean some hard choices and we're going to have to balance capability, industrial base, all of those different things. Some of the things that Senator Wicker has proposed in the Implementation Act, in terms of giving us faster use of those tools, I think can help us because if we do a multi-year contract, that can provide some stability from the year by year, which I think could help stabilize the industrial base.

Senator KING. Let me turn for a moment to the large surface combatant. When do you expect to start engaging with the industry?

Vice Admiral KILBY. So I think we have started to engage with industry on that. Again, there was a pause to push that slightly to the right. So we have set that up—and this is really Secretary Geurts' lane—a detailed design contract and then a follow-on contract in 2028. So I think we are poised to try to apply the same lessons we learned from frigate with that.

But I also agree with Secretary Geurts that there is a very real need to get after that and to continue to produce flight 3 just because of the pacing threat of what, Senator, you talked about earlier.

Senator KING. What concerns me is if we have a gap in flight 3's and a large surface combatant takes longer, you end up with a capacity shortfall that in a crisis could be a disaster.

Vice Admiral KILBY. So from a requirements perspective, I think, sir, what we are trying to say is the flight 3, I think, will be a consistent platform for us well into the future until we are sure we have the large surface combatant in hand.

Senator KING. Thank you.

Mr. Chairman, can I ask one more quick question?

Senator PERDUE. Absolutely.

Senator KING. I think I am scheduled to go down and see the *Ford* in a couple weeks. How are we coming?

Secretary GEURTS. Yes, sir. I will be with you.

Senator KING. When are we ready to go?

Secretary GEURTS. So the *Ford* has been out since we finished the PSA. It has been out to sea roughly 50 percent of the time. We have qualified all the different aircraft types in the air wing on *Ford*. It is performing magnificently out there. It is a first in class.

A first in class is hard. What I look forward to is you and anybody else that we can get out there, which I am confident we will continue to make opportunities, talk to sailors and get their perspective. I mean, you can hear from me. You can hear from generals and admirals here, but it is really in the sailors' eyes. They are really excited. It is really reassuring to see how excited they are. We did 211 launches and catapults.

Senator KING. They know best.

Secretary GEURTS. Yes, sir, absolutely. I look forward to getting you and anyone else out there to hear from them. Again, we are growing. We put a lot on their backs. They have got to learn how to train. They have got to build some of the standard operating procedures. But the capability that ship brings now in enabling us to do lots of things in the future is also fairly eye-watering.

Senator KING. Thank you. Thank you, gentlemen. I appreciate it. Thank you, Mr. Chairman.

Senator PERDUE. Admiral Kilby, I want to go back to the long-term plan. I respect all these short-term constraints and the problems you have. But you guys are charged to do both. I want to relate to the conversation we had yesterday briefly. In the 2016 Force Structure Assessment, the Navy stated to fully resource these platforms specific—and I quoting—demands with very little risk in any theater while supporting enduring missions, ongoing operations, and setting a theater for prompt warfighting response, the Navy would require a 653-ship force. Now, that 653 relates to the current shipbuilding plan of 355.

Secretary Modly said that—he gave us sort of a hint in this Force Structure Assessment that is coming. He said publicly that a requirement of somewhere around 390 is probably going to be a number that could be an, in his words, achievable force level which the Navy could aspire.

I have a couple questions around this. It gets complicated. But from the 390—and I am postulating here—if that is the new number, what is the 653 comparable number to the 390. If 653 relates to 355, what is the new aspirational number at the top?

The reason I am bringing that up, it goes back to we keep looking at this as a monolithic debate between China. This chart makes it look like there are only two near-peer competitors. That is not true. We are responsible today, given the operational requirements we put on our Defense Department, to have our Navy in places all over the world, the Indo-Pacific, as well as the Atlantic, Mediterranean, everywhere, and we see what China is doing there. We have to almost think about this in two theaters. Do we not?

The question I have is this. What is the number that corresponds to the 390? Could you also, as you answer that question—you almost have to look at in equivalent units. We do not know how many DDGs versus carriers versus submarines versus the *Columbia*-class. I mean, it is almost an equivalent unit conversation. But it is even more. But you said something yesterday that really resonated with me, Admiral. It is the lethality per boat.

We know the INF has restricted us in terms of our ranges. That now is no longer the restriction. You mentioned munitions and you talked about lethality being one of the top four priorities. Could you bring that in as part of the dimension around how we answer

this question? I am not beating you up again on being the messenger about we do not have a shipbuilding plan. I am trying to get at give us some idea of what we are working towards so we can start working with the administration and other members to help you.

Vice Admiral KILBY. Yes, sir. So let us just take that in a couple of different pieces. The 650 number or so is based on the combatant command demand signal for ships, which is high. All our combatant commanders want ships to satisfy their OPLANs.

Senator PERDUE. By the way, sir, just to be clear—I should have said this. The 355 and the 653 were pre-NDS. I think it is a major point. A follow-on question is, is that consistent with the NDS? I have a suspicion it is not, and I think we are seeing early indications from Secretary Modly that that might not be the case. Sorry to interrupt.

Vice Admiral KILBY. So just breaking that down, 653 was the combatant commander operational plan requirement. If we just aggregated all of those together in a number, that is what it would be. When we produce a Force Structure Assessment, we look at the likelihood of having all those things happen at once. We accept risk when we propose a force structure size—that will not happen all at once, and so 355 was a result of the 2016 Force Structure Assessment. A lot of other analysis from other groups that looked at that and came up with a force mix that aligned to be able to counter the world and the most vexing problems we saw at that time.

So what has changed? We have a new National Defense Strategy. The Navy has a new operating concept of distributed maritime operations. The Marine Corps has a new operating concept of littoral operations in a contested environment. So we have worked very hard over the last several years, particularly I would say in the last 15 months, to come together as a naval force to say how would we attack this very difficult problem that you have outlined on your graph.

So some trends that we have seen are we need to address the logistics part of this problem, not just unmanned, which we have talked about in previous force structure assessments. We are not ready to count those ships yet. We have not proven that technology. We owe you that test and certification plan. But we know we must go there.

This intermediary number of ships, these logistics ships, smaller amphibious ships, smaller logistics ships to support these two operating concepts could be, trending that we have looked at, places we need to go in the future. That does not necessarily reverse engineer all the other classes of ships we have had for the very consistent and still current reasons that we see in the future that we need to have attack submarines, large surface combatants, frigates that are very capable, and aircraft carriers.

So all that together creates a force mix based on what we think we need to do to satisfy the National Defense Strategy. So all that study is what we are presenting to the Secretary of Defense and what we hope we come back with you shortly.

Senator PERDUE. When will that be presented to him? When will we see that?

Vice Admiral KILBY. I think it is an ongoing effort. I do not have a date for you on when—

Senator PERDUE. That is when you marry the naval requirements to really support the NDS. That is something we have not seen.

Vice Admiral KILBY. Yes, sir.

Senator PERDUE. So that is the first time. I look forward to that. I would love to work with you guys on that.

Can you also add—and I am over my time, but can you briefly add the lethality question to that? A single boat, if you increase its range and number of munitions, if that is possible—does that not come into the calculus of how many total combatants you have to have?

Vice Admiral KILBY. It does. General Berger is very consistent with us when we get together and talk as a naval force. He said you have to consider the adversary's position, what they have achieved, what we think they are going to achieve. So that lethality piece is a key mix, and sometimes we get caught on numbers of ships, which is very important, but the capability they bring is equally important. The Navy has gone over the last several budget cycles, with the support of Congress, to increase the lethality of our ships.

Senator PERDUE. So I am sorry. But that will be incorporated in this new force assessment.

Vice Admiral KILBY. Yes, sir.

Senator PERDUE. Thank you.

Senator HIRONO?

Senator HIRONO. So when you talk about increasing the lethality of the ship, does that also include the resilience of the ship, the survivability of the ship? Because the more stuff we put on the ship, the more expensive. So survivability. Is that also a concern of course?

Vice Admiral KILBY. So I will start, ma'am. Lethality is a fundamental shift that the Navy and the Marine Corps have taken over the last couple of years based on the threat that, Senator, you talked about. So we went from a Navy that for the last 28 years, we have been focused on power projection to support the war that we fought. Right? So shifting that to be a sea control force—a sea control force means you have the offensive capability to push back the adversary's navies and other force joint elements. So that is a different mix of capabilities and platforms. So the survivability piece that we build in our ships I am very confident in, that those standards that are, one, characterized by our technical community but then built by our shipyards are key to our success in the future.

Secretary GEURTS. Yes, ma'am. If I could just add to that.

So another way to think about survivability, you have got to be able to take a punch. It is also are there new technologies—and we talked directed energy, we talked lasers—to allow you to not have to use up your missile inventories to defend your ship. You can use other technologies that preserve your offensive capability and more cost effectively avoid your enemy's ability to attack you. So if they are spending \$10 million or \$100 million missiles to get after us and I can knock those down very cheaply and I can save my weap-

ons, punch back, or make a move, that is how the two kind of play. So if you are survivable, you are more lethal. If you can survive and preserve your weapons, then you create new dilemmas for your enemy.

Senator HIRONO. Admiral, I am glad that you acknowledged that the unmanned ships that you are really exploring, that you are not ready to count those as part of the 355 ship inventory. Good. There is a lot more testing and proving we have to do.

I just have one short question for Secretary Geurts. Last year, your prepared testimony indicated that operations in a contested environment meant that the Navy's logistics fleet will need to include smaller, faster, multi-mission transports. This year, your prepared testimony on page 13 says—and I quote—the Navy will commence with concept studies to evaluate the next generation medium-lift intra-theater amphibious platforms and logistics ships. End quote.

So does this mean that no progress has been made in implementing these concepts or sorting through alternatives, as you mentioned them last year?

Secretary GEURTS. Ma'am, the way I would characterize is last year, since our 2016 FSA, we have not put the study that we needed to put into the logistics side of the fleet. How do we support this distributed operations? So as the Marine Corps and the Navy work together on the operational side to define better the requirement, we are now putting in place, working with industry, given that broad requirement—I will say need. We do not have it down to specifications. What can we bring to the table from a material solutions standpoint? Our 2021 budget has money in there so we can start delivering material ideas to consider.

So we have been working it from a study phase. We had no money in the 2020 budget. I just knew we were moving at it. We moved in the 2021 budget to put funding to get after it.

Senator HIRONO. All right. Thank you.

Senator PERDUE. Senator King?

Senator KING. Admiral, you are the commander of the fort. You are in the GIUK gap. A hypersonic missile is launched from Murmansk. It will be to your ship in about 14 minutes. Can you defend yourself?

Vice Admiral KILBY. If I have a carrier strike group with me, I can. It is not just the *Ford*. It is the elements of the carrier strike group that make that up. So those are the flight 3 destroyers we are talking about and the capabilities to—

Senator KING. Without getting into classified material, do we have a defensive system to confront a hypersonic missile traveling at 6,000 miles an hour?

Vice Admiral KILBY. I believe we do, and I look forward to briefing you later on this month and both committees on those technologies, sir, at a higher classification level.

Senator KING. Thank you. I think that is a very important question in terms of the viability. To follow up on Senator Hirono's question, a ship is not lethal if it is on its way down.

Secretary Geurts, you mentioned directed energy, a much more economical rather than \$50,000 or \$100,000 or \$200,000 a shot for a bullet. Where are we in terms of research on directed energy? Are

we at any place where it might be deployed on some of our larger ships that have large electronic capacity?

Secretary GEURTS. Yes, sir. We talked large surface combatant. Some of the reasons DDG flight 3's are quite capable—we may need more capacity to generate energy. That is one of the things we are looking at.

I could also tell you—and I had an old saying, you know, laser engineers all lie because I have been putting lasers on airplanes and stuff for a long time, and we have always been 2 years away from it for the last 30 years.

We are now putting them on ships. I was out on the USS *Dewey*. We got laser dazzler. They are going on fleet ships that will be forward deployed.

Senator KING. These are destructive lasers. These are not little green spots.

Secretary GEURTS. So we start with dazzlers. Right? So we are going to do that. So that is one element. So we will get that out there. That actually is a very useful warfighting capability. On the *Portland*, we are putting a laser on there so we can go test it at high power. Then we have got on our destroyers now another laser coming forward that we can integrate with a combat system.

So we are beyond now proving that the technology exists. We are putting it on ships now. The trick is how do you integrate that into the combat system and how do the sailors on that ship fight that system in the right way. That is the learning we are doing by putting it on fleet ships and getting it out there on the water.

Senator KING. A similar question about a technology that always seems to be 2 years away. Where are we on railguns?

Secretary GEURTS. That one is still out there. We are testing kind of trying to get to our goal of how fast can we shoot over a period of time. We are testing out at White Sands right now. We have got a test set up there. Seeing some promising results. That integration of that system is a little more evasive that we are going to have to continue to work through there.

Senator KING. But the work, the R&D, is being done.

Secretary GEURTS. The R&D is being done.

Then there is kind of a third area what I will call hypervelocity projectiles. So can I use 5-inch guns with new projectiles that allow me to create very effective low-cost ways to take down an enemy's higher-cost hypersonic type weapons. I think there is promise in there. We are doing a lot of testing in that realm as well.

Senator KING. We always think of our competition and great power competition as ships and bullets and guns and troops, but I think a lot of the competition is in R&D and innovation. We have got to be the most innovative and agile because we are in an entirely different competitive situation than we were even 10 years ago.

Secretary GEURTS. Absolutely. If you look at our 2021 budget, I mean, it is a lot of pressures. Our R&D is up. That came at a price in some of our procurement, and that is the trade we made so we can get ourselves modernized and pivoted towards kind of the new technology.

Then separately—and I am happy to come brief you in a lot more detail—rebuilding, restructuring our S&T enterprise and creating

much faster, cleaner pathways to get new ideas whether they are from the fleet or from a small business or a non-traditional academic, creating a pathway to bring those into programs much more quickly than long, laborious, valley of death journeys that many have had to go so far.

Senator KING. I thank you and compliment you for that because that is essential. Time is the other factor in this competition. Thank you very much.

Thank you, Mr. Chairman.

Secretary GEURTS. Yes, sir.

Senator PERDUE. Admiral Kilby, it is easy from the outside to look at statistics. I do not mean to do that but I have a question about the *Columbia*-class because I am afraid of the gap between the extended life that we are putting on the *Ohio*-class and the time frame of bringing the *Columbia*-class on. That potential gap is what I am going for.

In light of recent lead ship presentations, the performance is not very good. I know that was before the three of you were in your jobs. But a total of \$8 billion more than the initial budget was required to construct these ships. Each lead ship experienced cost growth of at least 10 percent, and three of them had 80 percent of more cost revisions up. It is funny. None of them went down. That does not happen in the real world either, by the way.

Each lead ship was delivered to the fleet at least 6 months late. This is what I am concerned about, is time, and of the eight lead ships delayed, more than eight were delayed more than 2 years.

So what comfort should we have in the *Columbia*-class? I think it is the third largest program—the second or third, anyway—in DOD. They are going to carry 70 percent of the nuclear payload of the triumvirate well into this—for most of this century.

So the question is, what confidence should we take away from the new direction in terms of our supply chain, our vendors? We went to 17,000 15 years ago, vendors for submarines, down to 3,000. Whether it is you or the Secretary, either one.

Vice Admiral KILBY. Yes, sir. I will start and just assure you that I have happened to be back in the Pentagon for a couple budget cycles in a row. *Columbia* remains our number one priority. It is me when I put together the budget. It is me when we consider issues. It has got our single focus to ensure that ship deploys in 2031.

Senator PERDUE. Now that you have been in and looked at it, are you pretty confident it is on target to do that?

Vice Admiral KILBY. Yes, sir. But I think we need to watch it, and we need to keep the structure we have and the focus and prioritization to meet that commitment for our nation. So that will continue.

I just wanted to give you our assurance this is not a recent change in our behavior. That consistency helps us look at issues and work with Secretary Geurts and the staff. We have been up to visit Groton and all the facilities down in Newport News. I have been there, and the CNO has been there. So it has got our attention.

Senator PERDUE. So the consistency of funding I know has been there. Two things. One is tell me how CRs affect that consistency

of funding each year because I am concerned about the supply chain base, the productive base that is actually going to help you do the 2031. Then as a carry-on to that, how confident are we that the maintenance facilities are going to be able to handle the new *Columbia*-class?

Vice Admiral KILBY. So I will ask Secretary Geurts to help me here. But what I wanted to tee up for him before that is the single focus and consistency on this program and our acknowledgement that we have to meet that commitment.

Senator PERDUE. Good. Thank you. So he passed you the CR question.

Secretary GEURTS. Yes. So we will need to start construction at full speed—

Senator PERDUE. This year.

Mr. GEURTS.—this year, and so you already have a legislative proposal for us to get incremental funding authority for the first two ships. We are negotiating those right now with Electric Boat. I feel very confident where we are sitting right now. So we will be ready to roll. If we are in a CR, then—

Senator PERDUE. Even if we do that, if we are in a CR in the fourth quarter of this year—it looks very likely at this point—will that not delay that?

Secretary GEURTS. I am confident the Department will bring this on as an anomaly, given its importance. I ask the Committee's support in working that through and approving that as an anomaly, should we get in that case.

In terms of what allows me to feel more comfortable about *Columbia* than other lead ships, a couple different things. One, the design maturity of this. One, I would say Jim has not changed the requirements on the ship for a long time. We have steady requirements. We have steady funding, two really good ingredients.

The third is we are not going to start construction with a design we have not completed. So we are on path to have 83 percent of the detailed design complete before we start construction. To put that in perspective, in *Virginia*, it was 43 percent; in *Ford*, it was 27 percent. So we will have the highest—in my opening remarks, when I say the highest degree of design completion before construction start.

Now, what did concern me when we talked *Virginia* was were we going to overload the industrial base by trying to do too much too fast. That was how we restructured that multi-year because the one thing that could still cause us issues is if we overload the waterfront. We have put in detailed reviews before start construction of any of the *Virginias* in the multi-year, and we have negotiated terms in the contract that we can move those construction starts and deliveries around to make sure that we do not have a hard conflict because, again, *Columbia* will be the priority.

Having said that, *Virginia* is the thing that gives us the best chance of success because we have stood up the workforce. It is an experienced workforce, and we are taking all of that into *Columbia*.

Senator PERDUE. Thank you.

The maintenance of those two boats, *Virginia* and *Columbia*, going forward?

Secretary GEURTS. Yes, sir. So, again, we have a lot of common equipment between *Virginia* and *Columbia*. So in that shape, we will be in pretty good shape. A lot of commonality on the missile side. But we have got to, again, continue to focus on it so that we have—a lot of the SIOP we are doing is putting in place the structure at the shipyards so that they can both take the *Virginia* payload module. So we have had to extend facilities and dry docks for the longer *Virginia* payload module, as well as *Columbia*. We are on track for that right now.

Senator PERDUE. Senator Hirono?

Senator HIRONO. No. Thank you.

Senator PERDUE. Senator King, do you have another?

Senator KING. I do not think I am an advocate one way or another on this, but I have always been a little nervous about the winner-take-all structure of the frigates. What is your thinking? I know there has been some discussion about it, but it just strikes me that if one yard gets all 20 and in terms of timing, in terms of risk, in terms of competition, it might make some sense to divide that contract. Where are you guys on that now?

Secretary GEURTS. Yes, sir. So as part of the competition, without getting into great levels of details, prior to that RFP are provisions for a technical data package. As part of the NDAA, we have got to be in a position to recompetete that contract after the 10th ship. In my thinking, the first priority is run a good, fair, credible, defensible competition to pick the right ship for the fleet. We are on or ahead of our schedule with that. I am feeling comfortable with that.

As we then choose that, we will look to see what a follow-on strategy may be.

Senator KING. Dividing the contract is still an option is what you are saying.

Secretary GEURTS. What is that, sir?

Senator KING. Dividing the contract is still an option?

Secretary GEURTS. Potentially. My preference and where I think the Navy is really sitting, though, is it will not be kind of like LCS and pick two different designs.

Senator KING. Oh, yes.

Secretary GEURTS. So there are certainly advantages like in DDG-51, having two yards being capable of producing it and creating competition like that. We are just in the *Columbia* years where we are trying to keep the DDG-51 line running. We are trying to bring up the frigate line. We are trying to produce *Columbia*. We are trying to attack the *Virginia*. It may be an affordability issue of how soon we could bring on a second yard because unless you get significant quantity, it will not be cost effective.

Senator KING. Are all the frigate competitors different designs currently?

Secretary GEURTS. They are all based on parent designs, but they all have unique designs.

Senator KING. Thank you.

Admiral, do you have any thoughts on that?

Vice Admiral KILBY. My only thought, sir, is the frigate from a requirements perspective is a key component of the future for us. You know, that ship—the way we have worked with the acquisition

community and industry is we are introducing a lot of common equipment that already exists like a smaller version of the advanced missile defense radar I think is an exemplar of that. So key for us in the future to this greater force that works together, and I think because of the size of it, we will be able to build more of them potentially and help this operating concept called distributed maritime operations.

Secretary GEURTS. Sir, if I might. You know, the Ph.D. level on this for all together is—whereas I see all the studies we have done since 2016, it talks to having a broader variety of capabilities and potentially platforms, and so you are not sending a high end platform to do a low end job or a low end platform to do a higher end job. The Ph.D. level acquisition approach we are working our way through is how can I provide these two and the fleets they represent a wider variety of capabilities but do that at an affordable cost that can maintain a supplier base.

I think there are elements to it. That is going to be what we are going to have to really work hard together over the next couple years. So we cannot just have one-trick ponies, but we can have 57 different ponies all completely unique. What we have done to kind of separate the combat systems and put common systems across our platforms helps. It helps from a maintenance standpoint. It helps from a training—

Senator KING. It is interchangeable and modular.

Secretary GEURTS. Yes, sir. I would say the theme for Admiral Kilby and I and General Smith and I is better integrating requirements and acquisition planning so they are not done in hand-off, you know, kind of in vacuums where it is transactional because we can create better acquisition outcomes by—creating much more integrated teams looking at that frigate is a good example. I think as we add these new types of ships, we have got to be very thoughtful as we approach that.

Senator KING. You will be happy to know that Plato would agree who said that justice consists of doing what you are best fitted for.

Secretary GEURTS. Yes, sir.

Senator KING. We are talking about that for the Navy. Thank you.

Thank you, Mr. Chairman.

Senator PERDUE. I love being around Ph.D.'s like you all the time.

Gentlemen, thank you for your testimony today. Unless we have any other questions, we have a few for the record that I would like you to respond to. But I want to close with this.

We are sitting with the United States Navy right now that is 55 ships by my math short of our number one peer competitor, and that does not count what Russia is doing beneath the seas with the Sev technology and putting as many boats as there are in the water.

Admiral, I know you are going to be with us later this month talking about aircraft carrier efficacy in a classified environment. I look forward to that. In that conversation, I would really hope that we could get to the offensive strategy of the Navy as well. I have heard a lot of conversation today about how we defend. I hear this a lot from the Navy, and it is centered around the aircraft car-

rier capability. I get that. I am not challenging that at all. But I am concerned about that we are so out-sticked today in terms of range, in terms of quantity of munitions, and so forth that it adds a dimension to this quantitative review that we are throwing up on the chart here that we are headed toward a world in a very short period of time in the planning period that we have to build these big ships of 15 years of being 80 ships in deficit just to China. So this is a big equation. I appreciate you guys being on the wall. We look forward to working with you and use us as a resource.

Yes, sir. Senator King?

Senator KING. Mr. Chairman, I would add there are disturbing indications in various parts of the world that China and Russia are starting to cooperate.

Senator PERDUE. Well, they are already members of the Shanghai Cooperative Organization, as are two other nuclear powers. There are four nuclear powers.

Senator KING. That takes that chart and makes it look a lot worse.

Senator PERDUE. Yes, sir. Two of those we consider allies. So this is a very dangerous world out there.

Thank you guys. This is a—I hate to use it. It is a sea change, but this is a real change in attitude. We see it here. We want to make the continuity of funding and the continuity of this relationship work. This Subcommittee is charged to do that. So tell us what we need to do. We will provide the oversight. I am not happy that we do not have the shipbuilding plan. I understand the circumstances, but we will have that conversation later this afternoon. Thank you all for being here. I appreciate it.

[Whereupon, at 11:47 a.m., the Subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEANNE SHAHEEN

WATERBORNE SECURITY BARRIERS

1. Senator SHAHEEN. Secretary Geurts, in both the fiscal year 2019 (Public Law 115–232, Section 130) and fiscal year 2020 (Public Law 116–92, Section 126) National Defense Authorization Acts, language was included that set requirements for the performance, certification and the awarding of future contracts for waterborne security barriers at Navy ports. What has the navy done to comply with these requirements?

Secretary GEURTS. The Navy is fully complying with the National Defense Authorization Acts (NDAA) for fiscal years 2019 and 2020, which prohibit Navy from obligating or expending funds to procure legacy waterborne security barriers for Navy ports, with exceptions for exigent circumstances and existing barrier refurbishment. The Navy is researching and testing maritime security systems with improved functionality, capability and/or efficiency. We are in the process of analyzing this research and test data to inform how Navy will update the operational and functional requirements for future barrier systems and develop an acquisition strategy for the next generation. In the meantime, if the Navy determines there is a need to procure barriers beyond the exceptions noted in the NDAA, the Secretary of Navy will submit a waiver as required by the NDAA, to include a requirements document, a certification of capability level, an acquisition strategy and certification that any contract will be awarded in accordance with full and open competition requirements of 10 USC 2304.

**DEPARTMENT OF DEFENSE AUTHORIZATION
REQUEST FOR FISCAL YEAR 2021 AND THE
FUTURE YEARS DEFENSE PROGRAM**

WEDNESDAY, MARCH 11, 2020,

UNITED STATES SENATE,
SUBCOMMITTEE ON SEAPOWER,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

MARINE CORPS GROUND MODERNIZATION

The Subcommittee met, pursuant to notice, at 10:00 a.m., in Room SR-222, Russell Senate Office Building, Senator David Perdue (Chairman of the Subcommittee) presiding.

Members present: Senators Perdue, Ernst, Hawley, Hirono, Blumenthal, Kaine, and King.

OPENING STATEMENT OF SENATOR DAVID PERDUE

Senator PERDUE. Call the hearing to order.

The Senate Armed Services Subcommittee on Seapower convenes this morning to examine Marine Corps Ground Programs in Review of the Defense Authorization Request for Fiscal Year 2021 and the Future Years Defense Program.

We welcome our two distinguished witnesses this morning, The Honorable James F. Geurts, Assistant Secretary of the Navy for Research, Development, and Acquisition. Good morning, sir.

Secretary GEURTS. Good morning.

Senator PERDUE.—Lieutenant General Eric Smith, Commanding General, Marine Corps Combat Development Command, Deputy Commander for Combat Development and Integration. Good morning, sir.

Lieutenant General SMITH. Good morning.

Senator PERDUE. The purpose of this hearing is to review the budget request in the context of how the Marine Corps is adjusting its ground modernization strategy to support the National Defense Strategy. Today, the world is more dangerous than any time in my lifetime. I agree with the National Defense Strategy that today we're facing five key threats in our national security: China, Russia, North Korea, Iran, and global terrorism. We face these threats across five domains: land, air, sea, cyber, and space. As we speak, our country's adversaries are plotting to undermine us, overtake us, and, in some cases, eliminate our very way of life.

Our military remains the envy of the world, but the competition is picking up, and we cannot be complacent. There is no doubt the

threats posed in our potential adversaries—by our potential adversaries apply to Marine Corps ground units, particularly the roughly 21,000 marines stationed or deployed west of the International Date Line. I am particularly interested in the extent to which the Commandant's planning guidance has driven a reallocation of resources in this budget request, including in the key areas of ground-based long-range precision fires, command-and-control systems for degraded environment, air and missile defense, unmanned systems, ground mobility modernization, and emerging capabilities. I also look forward to hearing how the Marine Corps intends to modernize and field new equipment to meet the challenges faced on future battlefields.

This subcommittee will continue to work with the Marine Corps to build ground capabilities ready to defend U.S. national interests, and will continue to demand the best use of every taxpayer dollar. I look forward to our witnesses' testimony and the question-and-answer period that we have before us.

I now recognize Ranking Member Senator Hirono.

STATEMENT OF SENATOR MAZIE K. HIRONO

Senator HIRONO. Thank you, Mr. Chairman, for holding this hearing.

I welcome our witnesses, Secretary Geurts—was it only 2 days ago?

[Laughter.]

Senator HIRONO.—we're back—and General Smith, to this hearing. This is to focus on the request for Marine Corps ground modernization programs, and we think that your testimony—well, I thank you for your testimony and for your service to our country.

As the National Defense Strategy states, the primary challenge facing our Nation is the reemergence of long-term strategic competition with Russia and China, and this shift in strategic direction has important implications for our marines. The men and women who serve in the U.S. Marine Corps are vital to global operations critical to our national defense, and we must ensure they remain ready and capable of addressing contingency—contingencies at a moment's notice.

Last year, General Berger released his Commandant's Planning Guidance offering his strategic vision for the Marine Corps. This guidance supports the National Defense Strategy and makes clear that the highest priority of the Commandant is the future-force design of the Marine Corps. To support this effort, the Marine Corps will closely scrutinize and eventually divest legacy defense platforms and capabilities that do not support the Commandant's Planning Guidance. This new force-design effort ultimately impacts many of the Marine Corps ground modernization priorities that we will discuss today. I hope our witnesses can provide this committee with an update on these efforts.

Of course, once the Integrated Naval Force Structure Assessment, FSA, is released, it will provide insight into how the Marine Corps will operate as it faces the challenges of the future. Like many of my colleagues, I hope we will have that planning document from the Defense Secretary's office in the near future.

The readiness of the Marine Corps remains a priority for this committee, which includes making sure our marines field combat-effective equipment that is in proper working order. To that end, the fiscal year 2021 budget request makes targeted investments in the ground combat portfolio of the Marine Corps.

The budget includes a total of 2.9 billion for Marine Corps procurement, and nearly 1.3 billion for research, development, test, and evaluation ground systems funding. Secretary Geurts, as you testified last week before the House Armed Services Committee, you said, quote, “The Marine Corps ground portfolio has shown significant progress over the last 5 years and is a top performing portfolio in the Department of the Navy. Programs are consistently meeting or delivering ahead of schedule, putting capabilities into the hands of the marines in the field today,” end quote. That is good-news story, and I encourage our witnesses today to share with this committee the lessons that you all have learned.

One of the most important Marine Corps ground modernization programs is the amphibious combat vehicle, ACV. The ACV is an 8-wheeled armored personnel carrier that will provide improved lethality and survivability to marines, and it will replace the assault amphibious vehicle, AAV, which has been in operation for over 40 years. Guess we got our money’s worth.

[Laughter.]

Senator HIRONO. The Marine Corps had originally planned to procure two increments of the ACV; however, the initial vehicle demonstrated increased capability, and the Marine Corps made the decision to combine all variants into one family-of-vehicles program. I think that’s probably a—that was probably a very wise money-saving as well as very efficient way to make the decision. Thank you. The fiscal year 2021 budget request includes 479 million to procure 72 full-rate production ACVs. I would welcome an update from our witnesses on the status of the ACV program.

The Marine Corps is also pursuing the joint light tactical vehicle, JLTV. This is a joint Army and Marine Corps program designed to replace the high mobility multi-wheeled vehicle, better known as Humvees. The JLTV provides increased protection while ensuring vehicles are within the weight constraints to enable expeditionary missions. The fiscal year 2021 budget includes 382 million to procure 752 vehicles. I assume you’re on track for that.

In addition to the major ground vehicle modernization programs, the Marine Corps has prioritized funding in the fiscal year 2021 budget request for the expeditionary ground/air task-oriented radar, G/ATOR, as a replacement for legacy radar systems. The Marine Corps plans to procure eight of these systems this coming fiscal year. The budget request also supports improvements to the high mobility artillery rocket system and funding for research efforts to address the long-range precision-fire capability gaps that exist between U.S. Forces and our adversaries.

What I have highlighted—while I have highlighted some of the efforts that the Marine Corps is pursuing to field the capabilities the future force requires, the Marine Corps must also maintain legacy platforms that remain critical to addressing current threats. I hope that you will inform this committee how you are managing risk by reducing and divesting of legacy platforms while

prioritizing funding for new capabilities that will be fielded to the force.

I look forward to your testimony.

Thank you.

Senator PERDUE. We now have time for statements from our two witnesses today.

Secretary Geurts.

STATEMENT OF THE HONORABLE JAMES F. GEURTS, ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION

Secretary GEURTS. Thanks, Mr. Chairman.

Chairman Perdue, Ranking Member Hirono, distinguished members of the subcommittee, thanks again for the opportunity to appear before you to address the Department of the Navy's fiscal 2020—or 2021 budget request as it applies to the marine ground systems.

Joining me today, again, is Lieutenant General Eric Smith. He is the Deputy Commandant of the Marine Corps for Combat Development and Integration, and we look forward to testifying in front of you today.

With your permission, I have a few brief opening remarks that I'd like to put in the record for the two of us.

Senator PERDUE. Yes, sir.

Secretary GEURTS. We thank the subcommittee and all of Congress for your leadership and steady support of the Department of the Navy. Our 2021 budget submission delivers ground vehicle and weapons readiness while modernizing to deliver a more lethal force in support of the National Defense Strategy. It demonstrates our continued commitment to ensuring our sailors and marines have the equipment they need to execute our national security.

As mentioned by Senator Hirono, the Marine Corps ground portfolio is a top-performing portfolio in the Department of the Navy. It's showing consistent delivery of equipment on or ahead of schedule, on or below budget, with performance above what we have as our threshold requirements. I'm very proud of the hard work both from the requirements side, from the acquisition side, and from our operating forces, as we've all worked together to get this portfolio where it needs to be so our marines always have the best equipment to do the job we're putting on their shoulders.

To highlight a few programs: last fiscal year, the Marine Corps leaned forward in fielding the JLTV, in partnership with the Army. We reached our initial operating capability 10 months early. We have over 500 vehicles fielded. That partnership with the Army has been particularly strong and particularly beneficial for the Marine Corps and, I think, also for the Army. That program is in really, really good shape.

The amphibious combat vehicle continues to execute on its baseline schedule and is going to enter initial operational test this fiscal year, with a full-rate production decision scheduled this fall. Recently, we completed all the live-fire testing for threshold performance on that vehicle, and we have met those threshold requirements already. So, that program is in good shape.

The G/ATOR radar, we've fielded 10 of those systems. We're continuing to field those. We've made it through full-rate production decision. We're also working closely with the joint forces to ensure that it's fully integrated, and, to the degree that that radar can help other services in some of their requirements, we're partnering closely with those other services.

Our highest ground modernization priority is our ground-based antiship missile. That couples this JLTV, in an unmanned form, with a Navy strike missile. Again, leveraging things that are already developed so we don't have to spend money redeveloping things that already exist. This capability, when employed—or deployed with our marines forward, gives them the opportunity to both protect our forces as well as extract a cost on our enemy, should they decide to do so.

These and the many other programs reflect a lot of hard work across the community and show the value of increased integration between the Navy and the Marine Corps—the Navy, Marine Corps, and the rest of the joint team, and the acquisition and requirements teams, who, together, have been delivering these transformative capabilities into the hands of our warfighters.

Continued budget predictability and stability will be necessary to maintain this positive momentum. Thank you for the strong support this subcommittee has always provided our sailors and marines and their families. Thank you for the opportunity to appear before you today. We look forward to answering your questions.

Senator PERDUE. Thank you, Secretary.

General Smith.

**STATEMENT OF LIEUTENANT GENERAL ERIC M. SMITH, USMC,
COMMANDING GENERAL, MARINE CORPS COMBAT DEVELOPMENT
COMMAND; DEPUTY COMMANDANT FOR COMBAT
DEVELOPMENT AND INTEGRATION**

Lieutenant General SMITH. Sir, I think Secretary Geurts will—has spoken for both of us, in all candor, sir. I'm just excited about taking your questions and give you some—

Senator PERDUE. Well, that—

Lieutenant General SMITH.—answers, because we have some truly good-news stories to tell you on how we're best utilizing the dollars that you're gracious enough to support us with.

Senator PERDUE. Well, it sounds like it, but I never give—I never want to do one of these hearings without giving the three-star in the room and opportunity to talk.

[Laughter.]

Senator PERDUE. So, thank you, sir.

Lieutenant General SMITH. Thank you, Senator.

Senator PERDUE. We'll start with that, General Smith. I'd like to talk about China. I know last week you brought it up in a couple of answers to several questions. It looks like the NDS is requiring, as Secretary Mattis called before he left, a maritime focus because of the way China has developed and because of the geography involved. You talked a little bit about their aggressive behavior, particularly in the first island chain. I was—I had the great opportunity—I was very blessed to participate in a flyover, part of a FONOP in the South China Sea late last year, and I was so im-

pressed with what was going on there, both Marine personnel as well as Navy personnel. It was just a first-class operation. These young people are the best we have. It's amazing. I want to congratulate both of you on that.

I have a question, though, about how the Marine Corps ground programs support the NDS and the Navy in this reposturing toward the mission with China, and particularly in the first island chain.

Lieutenant General SMITH. So, sir, thank you for that.

As you noted in your statement, sir, we've got about 21,000 marines west of the International Date Line now, and that number fluctuates on any given day, based on exercise schedules, et cetera. So, we are currently present in the first island chain throughout the Pacific, the South China Sea in particular. Those marines are there now. They're there conducting exercises, such as Balikatan, Cobra Gold, et cetera, and so, the Commandant's vision and focus is that you have to be inside that first island chain, which we already are, in order to impose a cost on any adversary. Any, and what we are trying to do, sir, is ensure that those marines, as they are forward deployed inside the weapons engagement zone of any adversary—in this case, you're talking about the first island chain—that they're organized, trained, and equipped to actually impose a cost on any adversary. So, when we talk about, sir, things like the amphibious combat vehicle or the ground-based antiship missile, paired with a stripped-down, lightened, joint light tactical vehicle that is robotic, that fires a antiship missile, those types of capabilities are redundant command-and-control architecture that can be independent from the overarching architecture. When we have those capabilities resident with us at all times within either the first island chain or anywhere within the Pacific, that is a threat that has to be reckoned with by a threat, as opposed to—we would have to return to, for example, a base, pick up heavier, bulkier equipment, which is the legacy equipment that Senator Hirono discussed, and return to a potential fight. We can't do that. We have to take it with us, have it with us at all times. That's the concept, sir. I think the programs that have been listed by yourself and Senator Hirono are exactly the kind of programs that are robust, resilient, and lethal, that the Marines have and are beginning to field within that first island chain. This budget will allow us to fulfill that obligation to those young marines and sailors that are out there right now. They're just not as well-trained, equipped, and organized as they might be with this continued steady funding.

Thank you, sir.

[The joint prepared statement of Secretary Geurts and Lieutenant General Smith follows:]

JOINT PREPARED STATEMENT BY SECRETARY JAMES F. GEURTS AND LIEUTENANT
GENERAL ERIC M. SMITH

INTRODUCTION

Great power competition has fundamentally altered the manner in which the U.S. Military must operate in the maritime domain. Our competitors have carefully studied U.S. Forces for the past two decades and built a force specifically designed to counter American maritime power and influence. Consequently, they have rapidly expanded their capabilities to deny U.S. Forces freedom of access within critical

maritime terrain and are increasingly motivated by pursuits of political, economic, and military hegemony in key regions.

The National Defense Strategy acknowledges this increasingly complex global security environment, and the Department of Defense has focused on strategic competition. Joint Doctrine Note 1–19, Competition Continuum, posits that, rather than a world either at peace or at war, there is “a world of enduring competition conducted through a mixture of cooperation, competition below armed conflict, and armed conflict.” The Navy and Marine Corps, therefore, are revising our organizations, training, and equipment to best support long-term strategic competition across the competition continuum. Integrated American Naval Power remains focused on deterring and, if necessary, defeating peer adversaries in a contested environment through persistent forward presence and action in an all-domain battlespace.

Our first priority remains deterrence, as the cost of competition will always be less than the cost—in both blood and treasure—of armed conflict. When called upon, however, the Navy and Marine Corps will fight forward together for sea control and sea denial, forcing potential adversaries to react to our naval efforts.

Over the past 18 months, multiple wargames have concluded that the best way for the Marine Corps to support the naval and joint force is to persist as “stand-in forces” inside the range of adversary fires, to maintain contact with our allies and partners overseas, and to compete below the level of armed conflict. Combined, these actions complicate an adversary’s decision calculus. Should deterrence fail, these forces will be postured to blunt the enemy’s actions and impose costly and disruptive dilemmas on him. To do so, the Marine Corps seeks to arm its Fleet Marine Forces with long range precision weapons which can strike enemy ships at extended ranges to assist the Navy in sea denial. Additionally, the Marine Corps will pursue command and control systems that allow our weapons to fire based on information obtained from joint U.S. assets across the battlespace. These systems will also ensure that information obtained by the Marine Corps’ “stand-in forces” can be passed to any U.S. strike asset across the joint force. This capability is called “any sensor, any shooter” and supports the entire joint force.

In order to create this new warfighting construct, the Marine Corps must realign our efforts and resources to pursue capabilities that provide the best counter to peer adversaries. With the assistance of the United States Congress, the fiscal year 2021 budget request will invest in the modernization for a more lethal force in support of the National Defense Strategy and the Commandant’s Planning Guidance. Key investments include ground-based long-range precision fires; command and control systems for a degraded environment; air and missile defense; unmanned systems; ground mobility modernization; and emerging capabilities.

GROUND-BASED LONG-RANGE PRECISION FIRES

The National Defense Strategy, as well as emerging naval concepts, identifies the need for naval forces capable of conducting lethal strikes at range, in depth, and with precision in support of sea control and sea denial missions. To support this requirement, the Marine Corps is committed to fielding ground-based weapons with sufficient range and precision to provide operationally effective surface-to-surface fires in the land and maritime domains.

The Marine Corps’ highest ground modernization priority, a Ground-Based Anti-Ship Missile (GBASM) capability, will provide these anti-ship fires from land as part of an integrated Naval Anti-Surface Warfare campaign. This forward-deployed and survivable capability will enhance the lethality of our naval forces and will help to deny our adversaries the use of key maritime terrain.

The Marine Corps’ GBASM solution is the Navy Marine Expeditionary Ship Interdiction System (NMESIS), consisting of an unmanned Joint Light Tactical Vehicle-based mobile launch platform, called the Remotely Operated Ground Unit for Expeditionary Fires (ROGUE-Fires), and Naval Strike Missiles (NSM). The NSM is identical to the Navy’s Over the Horizon Weapon System deployed on the Littoral Combat Ship and will provide the Marine Corps with a missile capable of sea-skimming, high-g maneuverability, and the ability to engage targets from the side, rather than top-down. This maximizes lethality and missile survivability. The first live-fire test of NMESIS took place in December 2019 and a second live-fire demonstration with a guided NSM is planned for June 2020.

To increase lethality, the Marine Corps’ ground-based long-range precision fires will consist of a variety of capabilities that complicate the adversary’s decision-making processes and ability to defend themselves. In line with this concept, in fiscal year 2019, the DoD’s Strategic Capabilities Office (SCO) initiated development of a Ground-Launched Cruise Missile (GLCM) capability that will provide increased

range to complement NMESIS. The Marine Corps will work with SCO to continue design and development of a mobile launch platform in order to prototype and field a Marine Corps ground-based, long-range, land attack cruise missile capability for employment by its rocket artillery units. Prototype launchers will undergo firing and endurance testing through fiscal year 2022, with the aim of fielding a battery of launchers to an operational unit in fiscal year 2023. This capability will add additional firing capacity to the Integrated Naval Force in support of both maritime and land operations in any theater.

The Marine Corps is also expanding the operational capacity of the High Mobility Artillery Rocket System (HIMARS); a battalion will stand up within 2d Marine Division during fiscal years 2021 and 2022 which will bring HIMARS capacity to two Active battalions and one Reserve battalion. HIMARS provides the capability to employ the lethal Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), which was developed and is also employed by U.S. Army HIMARS and MLRS equipped units. The MFOM includes GPS-guided precision munitions and will include the Precision Strike Missile (PrSM) now in development. The PrSM will enable rocket artillery units to accurately engage land and maritime, stationary and mobile, targets at ranges significantly greater than currently fielded munitions.

The combination of the above weapons fielded to the Fleet Marine Forces will provide the naval force with precise, lethal, offensive, surface-to-surface fires that enable sea control, sea denial, and the prosecution of landward objectives.

COMMAND AND CONTROL FOR A DEGRADED ENVIRONMENT

Fleet Marine Forces require a sustainable, defendable, and resilient Command and Control (C2) network. This network is part of the Naval Tactical Grid and supports Joint All Domain Command and Control (JADC2), providing timely, secure, and persistent information exchange while enhancing battlespace awareness to dispersed tactical units. Critical to that effort is the ability to coordinate and synchronize distributed fires and sensor systems to inform decision makers so that they can take decisive and timely action at the speed of relevance. Assured C2 capabilities enable and enhance combat effectiveness as well as protect forces operating from remote, globally deployed locations.

Command and control in a degraded environment requires a layered approach with the ability to adapt to changing electromagnetic environments beyond the line of sight. This layered network approach, coupled with a command philosophy that allows commanders at all echelons the freedom to make decisions while operating within their higher commander's intent, provides a resilient, dynamic C2 structure that harnesses new and emerging technology to support decision superiority.

Tactical Communications Modernization (TCM) provides crypto-modernized radio systems to meet National Security Agency mandates. High Frequency (HF) radios have been prioritized for modernization in order to support naval concepts in a spectrum contested environment. These new radios, coupled with advanced waveforms in development, provide a more robust, resilient, and secure radio frequency networks that support dispersed forces operating inside the range of adversary fires.

Networking On the Move (NOTM) provides Fleet Marine Forces with a robust, over-the-horizon and beyond line-of-sight, digital C2 capability while on-the-move and at-the-halt. NOTM provides maneuvering forces with the ability to seamlessly conduct digital C2 through access, collaboration, and exchange of tactical voice, video, and data while using a full suite of Combat Operations Center tactical software applications and services to support decision-making, fires, and increased multi-domain situational awareness from anywhere in the battlespace. NOTM provides access to three external network enclaves (NIPR, SIPR, and Mission Specific) via wideband satellite (Ku, Ka-currently developing X-band) communications services, and it bridges aerial Link 16 networks to ground forces to increase lethality of dispersed forces. Mounted and dismounted users are connected to these network enclaves via Type 1 encrypted wireless local area networks. NOTM is purpose built to support our naval and joint concepts that require our forces to fight distributed while allowing commanders the ability to effectively command and control forces in a contested all-domain environment.

Terrestrial Wideband Transmission System (TWTS) provides high capacity, beyond the line of sight and line of sight communications via tropo-scatter capabilities in a space-denied, terrestrial-only environment. This family of systems provides more flexible, scalable, and maneuverable terrestrial capabilities that also allows landing forces terrestrial ship-to-shore communications, retransmissions, and relays. Furthermore, the line of sight system will be augmented by free space optics communications which has line of sight low probability of intercept, low probability of detection, and anti-jam characteristics.

Marine Corps Wideband Satellite Communications Family of Systems (MC-WSATCOM FoS) is a comprehensive, integrated, and sustainable solution designed to address current and future warfighting capability needs using military and commercial SATCOM systems in an electro-magnetic spectrum contested environment. The MC-WSATCOM systems will be fully interoperable with joint and naval wideband SATCOM systems, and will provide the capabilities enabling C2 in Expeditionary Amphibious Base Operations.

Combat Data Network (CDN) provides firewalls, servers, and data infrastructure components that allow tactical and deployed forces to connect to the Defense Information Systems Network, Theater, and Marine Corps Enterprise Networks. Critical applications and services, as well as artificial intelligence and machine learning algorithms, will be hosted on the CDN to operate in a disconnected and degraded environment until connectivity is restored to enable replication and high data rate information sharing.

G/ATOR is a state-of-the-art, ground-based, short-to-medium range, expeditionary radar system designed as a single materiel solution to satisfy air surveillance, air defense, ground counter-fire and counter-battery, and potentially air traffic control mission requirements. Block I achieved Initial Operational Capability in February 2018 and Block II did so in March 2019. Full Operational Capability will be achieved in fiscal year 2025. G/ATOR detects the most formidable air threats to our forces and will out-pace our adversaries for years to come.

CAC2S provides the tactical situational display, information management, sensor and data link interface, and operational facilities for planning and execution of Marine manned and unmanned aviation missions in support of the fleet. CAC2S eliminates the current dissimilar legacy systems and adds capability for aviation combat direction and air defense functions. It provides a single networked system that integrates Marine manned and unmanned aviation operations with joint aviation C2 agencies. The Marine Corps intends to fully field CAC2S by fiscal year 2021.

AIR AND MISSILE DEFENSE

In great power competition, forward bases and legacy infrastructure will likely be vulnerable to an enemy strike; therefore, the Marine Corps must ensure our forces possess the capabilities required to mitigate those threats for themselves, the fleet, and the joint force. Additionally, naval forces around the world face risks posed by adversaries with ready access to low-cost asymmetric capabilities—whether traditional rockets or unmanned systems—that can strike our forces. With the increasing lethality of these low-cost systems as well as long-range precision fires, air and missile defenses provide critical capabilities for the Marine Corps to protect personnel, equipment, and installations and to persist as the Nation’s “stand-in” naval expeditionary force.

The Marine Air Defense Integrated System (MADIS) family of systems is the Marine Corps’ primary program for providing short-range surface-to-air fires and electronic attack capability. The MADIS is being developed in three versions: a JLTV-integrated version, a light version, and an installation version. In July 2019, the light MADIS successfully defeated a hostile Iranian unmanned aerial vehicle in the Strait of Hormuz.

The Marine Corps also continues to pursue the Medium Range Intercept Capability to provide a defense against cruise missiles. A demonstration in August 2019 at White Sands Missile Range successfully evaluated the integration of the Israeli Tamir missile and Battle Management Control system with the Marine Corps’ CAC2S and G/ATOR.

UNMANNED SYSTEMS

Given our adversaries’ abilities to strike with increasing range, precision, and lethality, we must reduce exposure of our Marines wherever possible and correspondingly increase our reliance on unmanned systems. These platforms and payloads will be pivotal on the future battlefield. The ability to flood an adversary’s decision-making and targeting processes with an array of low signature, affordable, and risk-worthy platforms in the air, on the ground, and on the surface will greatly expand the survivability and capabilities of Marines operating within the adversary’s weapon engagement zones.

For two decades, the Marine Corps has relied on unmanned aerial systems to provide reconnaissance for our ground forces, and the Marine Corps will continue this investment in the future. On the ground, the aforementioned ROGUE-Fires system is an example of employing an unmanned system to increase Marine Corps ground forces’ lethality.

Another program that will support Marine Corps operations in the future is the Long Range Unmanned Surface Vessel. This surface vessel will provide an autonomous platform for precision fires against sea and land targets as well as the launch and recovery of smaller unmanned aircraft, unmanned surface craft, and unmanned underwater vehicles for reconnaissance, surveillance, hydrographic survey, and mine detection. In 2019, the Long Range Unmanned Surface Vessel completed the Advanced Naval Technology Exercise-East Super Swarm Exercise and demonstrated the ability to launch autonomous systems, keep station, and conduct autonomous navigation while avoiding hazards on a route from Norfolk, Virginia to Cherry Point, North Carolina. With our budget submission for 2021, the Marine Corps will seek to procure three vessels to conduct further evaluation and demonstration.

These unmanned systems will not replace manned platforms but will team with them to maximize and expand our ability to sense and shoot across the domains. The further integration of aerial, ground, and surface unmanned systems across Fleet Marine Forces will provide the warfighter enhanced capability to operate sensors, deliver fires, and shorten the naval and joint force kill-chains.

GROUND MOBILITY MODERNIZATION

The distribution and maneuver of Fleet Marine Forces ashore will be a key enabler of operations to sense, engage, and defeat adversary forces occupying the maritime domain on land, in the littorals, and in blue water. Capabilities for the warfighter must include vehicles that can operate in complex urban terrain as well as in austere environments. To this end, our ground mobility modernization programs remain healthy and critical to providing protected mobility, enhanced maneuver, and flexibility to support the full range of future operations capabilities.

In 2019, the Amphibious Combat Vehicle (ACV) program progressed into a Family of Vehicles approach. The fiscal year 2021 budget request will further the success of the program by continuing to fund the procurement of the personnel variant and the development of the mission role variants (MRV) for command and control and medium caliber cannon. Procurement of the MRVs is planned for subsequent years. As a power projection enabler and key source of dual domain protected mobility, the ACV aligns with the National Defense Strategy and the Commandant's Planning Guidance.

Paralleling our efforts with the ACV, the Marine Corps achieved initial operational capability with the Joint Light Tactical Vehicle (JLTV) program in August 2019 with the fielding of vehicles to 3d Battalion, 8th Marines and select elements in the training base. The program is currently planned to fully replace the High Mobility Multipurpose Wheeled Vehicle (HMMWV) by 2030. The fiscal year 2021 budget request prioritizes the fielding of vehicles to all Active infantry battalions and designated supporting units, which will occur by fiscal year 2022. The vehicle's design includes the capacity to power, host, and integrate current and future capabilities, such as GBASM and MADIS. Additionally, the Ultra-Light Tactical Vehicle (ULTV) will be fielded during this period. This vehicle lends tactical units a lower cost, flexible platform across a broad array of terrain sets and mission sets to include logistics, command and control and maneuver.

EMERGING CAPABILITIES

Key warfighting investments along with the increased readiness of our force lay the foundation for the Marine Corps' fulfillment of its requirements in the National Defense Strategy. Continued and critical investments in science, technology, research, and development will further enhance the ability of the Fleet Marine Forces and the naval team to impose costly and complex dilemmas on adversaries and will enable those forces to deploy in new and more lethal formations.

Capitalizing on the transformation which began in fiscal year 2020, the Marine Corps continues to reallocate resources from legacy capabilities that do not meet our future requirements to modernized capabilities aligned specifically with the National Defense Strategy and Defense Planning Guidance. In concert with the Office of Naval Research, the Defense Advanced Research Programs Agency, and the Strategic Capabilities Office, the Marine Corps is aggressively pursuing the development of disruptive capabilities in the areas of signature management, artificial intelligence, autonomy and robotics, expeditionary logistics, and long range precision fires in order to increase the survivability and sustainability of our expeditionary advanced bases within an adversary's weapon engagement zones.

CONCLUSION

Your United States Marine Corps remains a key component of the Nation's naval expeditionary force-in-readiness. As we undertake an era of new challenges, a new

force design coupled with emerging capabilities will be critical to creating the competitive overmatch desired by the National Defense Strategy and to supplying the joint force with an “any sensor, any shooter” capability that persists within an adversary’s threat rings. The Marine Corps is not embarking on this mission alone. Through the Integrated Naval Force Structure Assessment, collaboration on naval warfighting concepts and doctrine, and joint wargaming and experimentation, we will build a naval force design that integrates capabilities across the warfighting domains, defines how we operate, and results in solutions that are creative, relevant, and resilient.

Your Marines, alongside our Navy shipmates, remain ready to defend our Nation, and with advances in our training and education establishment, they will continue to evolve and to build the critical skills necessary to maximize our capabilities on the battlefield. Your continued support for the warfighter with full and on-time funding, your assistance in realigning our efforts and our resources for great power competition and peer conflict, and your thoughtful oversight will ensure your Integrated American Naval Power remains ready, relevant, and prepared to deter and defeat current and future threats.

Senator PERDUE. I’m sorry. We’re having a little bit of a problem with our timing. We’re going to limit this to 5-minute rounds, here. So, I’m going to assume—we have plenty of time. We don’t have a vote until noon, so these guys are going to have a full boat, here.

With that, though, I’ll move to Ranking Member Hirono and her questions.

Thank you.

Senator HIRONO. Thank you.

Over the past few years—this is a question for General Smith—this committee has heard testimony detailing the increase in lethality gaps between the U.S. Military and our near-peer competitors. So, we actually are supposed to be decreasing the gap, but the gap is increasing. The National Defense Strategy also highlights this disparity and makes addressing the lethality of our forces a priority. Can you identify the investments the Marine Corps made in the fiscal year 2021 budget request that will allow the Corps to address gaps in lethality and effectively compete with a near-peer competitor?

Lieutenant General SMITH. Yes, ma’am. Our number-one current unfunded priority-list item is the ground-based antiship missile. And—

Senator HIRONO. Is that what? I’m sorry. The ground-based—

Lieutenant General SMITH. Ground-based antiship missile—

Senator HIRONO. Okay.

Lieutenant General SMITH.—which is the naval strike missile. We’re often asked, ma’am, What are marines doing with an antiship missile? The response for us is actually fairly simple. We are the littoral combat force present within the Pacific, and in—and specifically in the first island chain. As that force, we already can fire, in our coordination with the Army off of our high-mobility artillery rocket system, HIMARS—we can fire an Army ATACMS missile that goes out couple of hundred miles. It makes sense to us that any force that is the littoral combat force should have a weapon system that can place a threat on an enemy ship. So, that ground-based antiship missile, which is highly mobile, small, fits on the back of a joint light tactical vehicle, which we’ll test fire this June after a successful test in December of a—we would call it a slug, but it’s an inert round. We actually tested that successfully in December. We’ll do the live missile in California in January—I’m sorry—in June. That capability causes any threat to have to

take a step back and consider that there are potentially dozens of these forces scattered throughout the Pacific—means that the sea lanes, in support of distributed maritime operations, are no longer free and open for them.

Senator HIRONO. So, if this missile is so important, why was it not included in your fiscal 2021 request?

Lieutenant General SMITH. Yes, ma'am. So, some of it, ma'am, was ARC'd, and some of it is—we now have the capability, after a successful demonstration in December, to actually go forward. What we're trying to do—we did fund it, parts of it. What we've asked for with the unfunded priority list is, we have to plan for success. I believe we're going to have it in June. When that happens, I'll be able to accelerate the procurement of about 36 of these missiles by a year from—

Senator HIRONO. Oh.

Lieutenant General SMITH.—from 2023 to 2022. That allows me to field this capability much faster than it otherwise would have.

Senator HIRONO. That's good.

So, the Chairman asked you some questions regarding what's happening with, basically, China in the first island chain, and you say that you have a presence there. How many troops—or how many people do you have in this part of the world, in the Indo-Pacific region? Did you say?

Lieutenant General SMITH. So, on any given day, ma'am, there's about 21,000 marines west of the International Date Line.

Senator HIRONO. Marines, okay. So, do—does that mean that you have an obvious physical presence in this part of the area—

Lieutenant General SMITH. Ma'am, absolutely.

Senator HIRONO.—in the Indo-Pacific region? Have you ever had any encounters with Chinese forces in the first island chain—

Lieutenant General SMITH. Well, ma'am, I would—

Senator HIRONO.—that you can talk about?

Lieutenant General SMITH. Yes, ma'am. I would not say “encounters with forces.” I—my previous job, just about 8 months ago, was the commanding general of the 3rd Marine Expeditionary Force based in Okinawa, Japan. So, those 21,000 marines west of Date Line were the ones I commanded. Today, one of them is my son, who is forward deployed there now, so I have a little back-channel source of information to find out how we're really doing there.

I would not say “encounters.” Certainly, we've seen very public accounts of unprofessional passages of ships and aircraft from the Chinese against our aircraft and ships. As far as personal encounters, we certainly see Chinese representatives at exercises, where they often send observers. They've been invited, in the past, to Rim of the Pacific exercises, based out of Hawaii often.

Senator HIRONO. Yes.

Lieutenant General SMITH. But, no encounters, per se, for marine ground forces there in the first island chain.

I would offer, ma'am, very quickly, that the best place for me to be was in any of our—and I'll just say this publicly—in any of our partner nations, the best place to be was somewhere about 2 weeks after a Chinese delegation left, because we would come in and actually offer training, assistance, and support. That was very different

from the encounter that many of these countries had with Chinese delegations, which were much more forceful and less helpful.

Senator HIRONO. Okay. That's good to know.

Regarding the ACV—so, the initial variant exceeded the capability requirements, which is unusual, I would say. So, Secretary Geurts, what lessons, if any, can the Marine Corps apply to future acquisition programs, based on the ACV acquisition strategy?

Secretary GEURTS. Yes, ma'am. I applaud both the requirements testing and acquisition team. What they did was, in our initial operational assessment of the basic variant, they tested that variant all the way to the next-increments level of capability and thought, proactively, that had, you know, we been successful, as we were, that would enable us to immediately go to that next increment, as opposed to having a costly second development program and then retrofit and retro—

So, by proactively, I would say, being opportunistic, and if we're going to compete—to the Chairman's point, if we're going to compete, we have to be very opportunistic. They were opportunistic in preplanning, "Hey, let's test to the next level, let's not be afraid of it not working"—

Senator HIRONO. Okay.

Secretary GEURTS.—because if it works, that opens a whole new acceleration path for us.

Senator HIRONO. So, are you going to apply that test to the next level to other acquisition—

Secretary GEURTS. Yes, ma'am.

Senator HIRONO.—programs?

Secretary GEURTS. We've been—

Senator HIRONO. Is that what you're saying?

Secretary GEURTS.—working very closely with the operational test community. On the Navy side, we had a missile program, and we worked in advance. If a missile was successful, we could suspend testing early, which saved us 75 missiles and a lot of money, because it was successful. Even on ACV and live-fire, we did some testing on the initial vehicle. That testing proved successful. That allowed us to cancel a test, where we would have had to blow up a low-rate initial production vehicle. Now we have another vehicle for the Marine Corps.

So, it's all about closing this distance and thinking forward of the problem, not reacting.

Senator HIRONO. Yes. I commend you for that. So, you have other examples where you've pushed things, the testing, so that—

Secretary GEURTS. Absolutely.

Senator HIRONO.—you get the results you want without expenditure of unnecessary funds. Thank you.

I don't know where—oh, here. I should pay attention.

Thank you very much.

Senator PERDUE. Senator Ernst.

Senator ERNST. Thank you, gentlemen, very much for being here today, and, of course, we do regret the loss of our gunnery sergeant and captain over the weekend in their fight against ISIS, and our prayers will be, of course, with their families.

General Smith, I'd like to start with you, please, sir. The Marine Corps uses unpredictable deployments into INDOPACOM to keep

our adversaries really on their toes, which is a good thing, and reaffirm and build relationships with our regional partners. Our competitors—our near-peer competitors pay special attention when the marines deploy with all the equipment they would need for an offensive operation, regardless of the simplicity or the routine nature of your missions. So, how is the Marine Corps currently leveraging the use of technology—specifically, an area I’m interested in, autonomous technology—with conventional deployments to change the calculus and, of course, the—disrupt the decisionmaking cycle of our adversaries? If you could detail that for me, please.

Lieutenant General SMITH. Yes, ma’am. Well, first, on behalf of Major Dan Yoo, who’s the Commander of Marine Special Operations Command, I know he would personally tell you thank you for the condolences on the loss of those two Raiders.

Ma’am, an example—a specific example would be—we run an evolution every year, sometimes twice a year, called ANTX, the Advanced Naval Technology Experiment—Exercise—pardon me. We did one at Camp Lejeune, just this last July, where we demonstrated a capability called LRUSV, long-range unmanned surface vessel. It’s a 33-foot rigid-hull inflatable boat that’s completely autonomous. We sent it from Norfolk all the way down the intra-coastal waterway to Camp Lejeune, about 200 miles. It was completely autonomous, no people on board, controlled, actually, from Norfolk. When it got to the intracoastal—or to Mile Hammock Bay off Camp Lejeune, it launched what we call “swarming technology,” small Coyote drones, that can then go in and either lethally strike a target or observe a target. So, as we field that kind of capability, that’s the kind of capability that we will then provide to those forces forward underneath the command of Lieutenant General Stacy Clardy, who is my replacement out in 3rd Marine Expeditionary Force, so that these lighter, more lethal, resilient capabilities, as we develop them—our rogue fires, vehicle-firing, and naval strike missile—we would take those with us on exercises so that the things that are in the—we call them Quadcons—40-foot shipping containers as we move to an exercise, that complicates an adversary’s calculus, because if you don’t know what’s in that, it could be weights for a weight room or it could be a lethal strike missile; it could be drone technology or underneath that canvas could be MREs and water. That’s how you calculate—or cause cost imposition, because now an adversary has to observe everything. As we begin to get lighter and more distributed, in support of distributed maritime operations, with ships and personnel and smaller units, you impose an intelligence, surveillance, and reconnaissance, ISR, tax on an adversary because you spread out. Any of these capabilities could be lethal to them.

Senator ERNST. Right.

Lieutenant General SMITH. Does that help answer—

Senator ERNST. Yes. It does, actually. If you could, a little bit further, that LRUSV—right?—long-range unmanned surface vehicle—

Lieutenant General SMITH. Surface vessel.

Senator ERNST.—okay. Vessel. Excuse me. Okay. Got to get the Army out of me. Okay. So, with that new technology, autonomous technology, I understand using that along our coast here, but what

about operating in a degraded environment? Do you think that that has the capability to do that and perform just as well as it did here?

Lieutenant General SMITH. Yes, ma'am. It does. The technology, as you said, is not that complicated. It is—it's truly—it exists now. It's—I say Buck Rogers. None of the marines know what I'm talking about.

[Laughter.]

Senator ERNST. I get it.

[Laughter.]

Lieutenant General SMITH. Yeah. But, it—this is not way out. This is technology that exists today. So, transforming that into something that is useful in international waters—

Senator ERNST. Yeah.

Lieutenant General SMITH.—is not difficult at all. Autonomy, most ships now operate off autopilot for the vast majority of the time, as do aircraft. But—so, not a hard lift, and not a hard technological challenge to make these things happen. Not easy, and doesn't require no research, development, and technology dollars, but certainly not something that is a 5-, 10-, 20-year project. This is—technology exists now, and, under the leadership of Mr. Geurts, we'll be as creative—

Senator ERNST. Yeah. Thank you.

Lieutenant General SMITH.—as we can in our experimentation so we can get these things online and out to the warfighters as quickly as we can do that.

Senator ERNST. Yeah. Certainly. I appreciate that very much. It's something that, in my subcommittee, in Emerging Threats and Capabilities, we continually are looking at ways that we can lessen the—lessen the risk that will put our marines, our sailors, our airmen, and our soldiers into—so, I appreciate that. That's good to hear about.

Can you describe the Marine Corps efforts to streamline information-sharing across the joint force? Would we come out on top in a potential conflict in the Asia Pacific?

Lieutenant General SMITH. Ma'am, I'll start, and pass to Secretary Geurts.

So, for information-sharing, the overarching concept, the Air Force is currently leading an effort called JADC2, Joint All-Domain Command and Control. The goal is, we—you'll hear the term "any sensor, any shooter." What that simply means is that a marine who's in the first island chain who observes or, using a UAV, observes, or using a radar, our G/ATOR radar, observes a target, should be able to pass that information seamlessly to an Air Force F-35A or a Navy destroyer or frigate and/or a long-range Army unit firing PrSM. So, that capability underneath JADC2 is being tested and experimented. All the services—I do a almost-weekly meeting with the other service three-stars to make sure that all of us feed into a joint all-domain command-and-control network that then has machine-to-machine discussions, machine-to-machine learning, so that we can truly have a ubiquitous command-and-control network that's out there, and then what the Navy has to produce underneath that, the naval grid, is when we are cut off from that overarching grid as a distributed maritime operation

forcet. We would have the ability to still command and control within our own naval network. We're working that very closely with Lieutenant General Lori Reynolds and Vice Admiral Kohler.

Senator ERNST. Right. Yeah.

Secretary GEURTS. Yes, ma'am. I think—"autonomy," we think of sometimes in vehicles. We've got to think of it in the information. So, as we go from small teams widely dispersed, they don't have the time to do all the information sorting, and—so, getting the right information to the right person at the right times, and then also transforming from many marines flying one vehicle to many vehicles flown by one marine. So, getting away from a hands-on element and doing more of a mission, "Okay, you swarm of UAVs, go do this mission for me" is where you're seeing that transformative thing. The—kind of, the rip-off-and-deploy kind of R&D is out there. Our ANTX, we had 1,700 participants.

Senator ERNST. Wow.

Secretary GEURTS. Three-hundred technologies have either gone into programs or are maturing out of that. So, again, it's getting the user at the point of need, closest to the problem, and we're seeing a lot of benefits from that.

Senator ERNST. Excellent.

Well, thank you, gentlemen, very much, Secretary, General. I appreciate it. Interoperability is key, and I know our law enforcement agencies started doing that right after 9/11. It's about time that our DOD get on board, as well. So, thank you very much. Appreciate it.

Thank you, Mr. Chair.

Senator PERDUE. Senator King.

Senator KING. Secretary Geurts, my first question I thought of when you were testifying about the success of these programs is, How did you do it? You talked a little bit to Senator Hirono about testing, but did you also lock down requirements early and—I mean, give me a—an outline of how you accomplished the—something which, frankly, hasn't been going that well in some of the other services.

Secretary GEURTS. Yes, sir. Again, it comes on the backs of some programs that didn't do so well, so that caused us, I think, to take a step back. My experience, whether it was at SOCOM or here with these programs, is, the closer you can link end-user and acquiror and technologists into a much more integrated—having a conversation, and getting to integrated processes versus transactional processes—

Senator KING. Right.

Secretary GEURTS.—the better you are. So, if you have a very transactional—somebody writes a requirement and then hands it over the fence to somebody that go—puts a bid out, then hands it over the fence to a contractor, that hands it over the fence to a tester—one, that takes a long time, and, two, it's not—

Senator KING. If it's not—

Secretary GEURTS. You're trying to manage downside risk—

Senator KING.—right at the end, you've got to start all over again.

Secretary GEURTS. Yeah. You don't leverage opportunity that way, because opportunity has a hard time traveling through those

gaps. I think the end reason the success was huge, we had a very focused program executive officer with a very empowered using team, and they worked together seamlessly. They each had their roles, but they worked seamlessly, with one end in mind: get marines the best equipment as fast as we could.

Senator KING. Did you have the same people throughout the process?

Secretary GEURTS. We had many of the same people, but I think it—I know we get in the debate of, you know, do we keep people there forever?

Senator KING. Right.

Secretary GEURTS. I—there's a balance to that.

Senator KING. Sure.

Secretary GEURTS. I think we had the same—

Senator KING. But, it does help to have some—

Secretary GEURTS.—we had the right culture—

Senator KING.—continuity.

Secretary GEURTS. Yeah. There's continuity in the motions, continuity in purpose and culture. Some of that's driven by having the right leadership there for the whole journey, and we had some key leaders there for the whole journey. But, more of it's a mindset.

Senator KING. Finalizing requirements and getting 80 percent of the solution instead of 100 percent, I take it, is helpful.

Secretary GEURTS. Yes, sir. Being very—

Senator KING. With the past programs, the requirements keep shifting, the manufacturer keeps having to reinvent things as they go along.

Secretary GEURTS. Yes, sir. Being very pragmatic of not chasing—you know, the programs that tend not to work well is, you have the big-bang theory, and you work for a long time to then prove if the big-bang worked or not, as opposed to doing a much more—faster, incrementally funding. I think the 80-percent theory is going to go back to—you know, from my SOCOM days, it's 20 percent, five times as fast, and just being able to quickly create iterations that then, at time of war or crisis, you can pull away.

Senator KING. A new weapon that's still in the development stage doesn't do much good in a conflict.

Secretary GEURTS. Yes, sir. I think the other trick is—

Senator KING. General, do you want to—

Secretary GEURTS. Yes, sir.

Senator KING. I think the General wanted to—

Lieutenant General SMITH. Mr. Secretary, if I may.

Secretary GEURTS. Yeah, go ahead.

Lieutenant General SMITH. Sir, just one other example. For example—

Senator KING. Is your mic on? I'm sorry.

Lieutenant General SMITH. Sir, it is.

Senator KING. Yeah, okay.

Lieutenant General SMITH. I'm using my Texas quiet voice. Sorry, sir.

Senator KING. I didn't know there was a Texas quiet voice.

Lieutenant General SMITH. Well, I'm from North Texas, sir. So—

Senator KING. Oh, okay.

[Laughter.]

Lieutenant General SMITH. So, sir, an example. When we've tested out the amphibious combat vehicle, the Marine Corps also made a commitment. We said, "We're going to take an entire infantry battalion," 1st Battalion, 7th Marines—we took them out of our training exercise and employment plan, which is deployments and major exercises, and said, "Your mission for the next year is, you are the testbed." One single battalion. Because, otherwise, sir, if you move it from unit to unit, the same marines learn the same initial——

Senator KING. Right.

Lieutenant General SMITH.—challenges, and, over 3 months, if you asked them, 6 months into a test, the things they worried about the first 2 weeks would have been found to be insignificant. So, we carved out an entire battalion, 800 marines, for an entire year to do that test and eval. So, you got a steady state of feedback from lance corporal staff sergeants——

Senator KING. Well, I want you guys to bottle this throughout the Defense Department, because we've had a lot of fits and starts and unsuccessful development, particularly on the vehicle front. So, please share this information.

Secretary Geurts, do a little white paper, how to do procurement right.

Changing the subject. Is the G/ATOR program going to be at all useful with regard to hypersonics? Do you think that is at a—is that going to be—well, I think I stated it. Is it going to be useful in that situation?

Secretary GEURTS. Yes, sir. Maybe in a different forum we can go into a little more detail with you. Happy to give you some information in that. But, certainly, it is a extremely powerful radar. In the initial fielding, we didn't populate all of the antenna array, so there is still some opportunity to grow that. We wanted to get the initial capability out there, kind of to——

Senator KING. Well, I think one of our——

Secretary GEURTS.—previous point.

Senator KING.—most urgent strategic challenges is hypersonics, particularly to the fleet, and so, I hope we can stay on that.

Command and control, cyber risk. Centralizing command and control makes all kinds of sense, but it presents a fat target to a cyber-enabled enemy. I take it—I am assuming that the development of these new systems takes cyber risk very much into account.

Secretary GEURTS. Yes, sir. Part of our operational testing——

Senator KING. The right answer was yes. I like——

Secretary GEURTS. Yes, sir. Yeah. It's—it—part of our operational testing, we do that. Now, is it suitable? Is it effective? Then, how does it fare in the cyber realm?

Senator KING. Thank you.

Thank you, gentlemen. I'm hoping to get back. I've got a few more questions.

Thank you, Mr. Chairman.

Senator PERDUE. Senator Hawley.

Senator HAWLEY. Thank you, Mr. Chairman.

Thank you, Secretary, General, for being here.

Let me also take this opportunity to offer my condolences to the families of the two marines that you lost this past weekend—on Sunday, I think it was—and to say that we're grateful for their service, and grateful for yours.

General, if I could start with you, let's talk about intermediate-range missiles, if we could for a second. The FY20 NDAA prohibited funding for the procurement or deployment of intermediate-range missiles. If FY21 NDAA contains a similar prohibition, can you talk to us about what that will mean for your ability to field the long-range fires that you need for your sea-denial mission?

Lieutenant General SMITH. So, sir, I—what I can talk about, if it answers your question—I think it will—is, what I actually have to have is the ability to reach out—and I'll be cautious in the open setting, but to reach out hundreds of miles to place ships at risk. It can't be something very short. Hundreds of miles. Because if you look at the expanse of the Pacific, our current issue—and Senator Hirono raised it—is being, we would say, out-sticked in range by the opponent, which we cannot allow. If the opponent can reach me at 1,000 miles and I can reach at less than 1,000 miles, that is highly problematic for a force who doesn't live inside the weapon. We operate inside the weapon in the engagement zone, but we are not permanently large-based, if you will, inside that. So, we have to have the ability to reach out hundreds of miles.

Senator HAWLEY. That's helpful. Thank you.

Can you clear up something else for me, General, in this same—in a similar vein? The ground-based antiship missiles, the ground-launched cruise missile, your testimony, if I read it correctly, seemed to treat those as distinct capabilities. But, I was under the impression, in the public reporting, and also, General Berger's testimony last week suggests that the ground-launched cruise and the antiship capability—I'm sorry, that the ground-launched cruise missile, the GLCM, will have an antiship capability. Am I confused about that? I mean, can you help me there?

Lieutenant General SMITH. I'm pretty leery about saying that a Senator is confused, so I'll be careful there, sir.

[Laughter.]

Lieutenant General SMITH. Sir, you're not. The ground-launched cruise missile, or GLCM, is a task that the Deputy Secretary of Defense has passed to the Marine Corps to have an operational capability very quickly for something that reaches out—again, I'll just say hundreds of miles. That is a separate fielding, testing, and evaluation program now. The naval strike missile, which we call a ground-based antiship missile—but, that is an existing technology now. The Navy already shoots it. So, for us trying to field a capability rapidly to show that General Berger's planning guidance has the teeth that it does, we'll pair that missile, which is existing now, with a JLTV. We call it a rogue-fires vehicle, a robotic vehicle. We'll pair that immediately. So, that ground-based antiship missile capability is currently naval strike missile. The ground-launched cruise missile or any other system ideally can be fired off of that same platform. So, the platform is the platform. It's agnostic as to what it fires.

Senator HAWLEY. Gotcha. That's helpful. Thank you.

I've heard some concerns that some of the Corps' long-range precision-fires programs might be redundant to programs that are under development currently by the Army. Can you just respond to that?

Lieutenant General SMITH. Sir, I just testified last week with General Murray, who is the commanding general of the Army Futures Command. I would say they're not redundant, sir. There are always overlaps, which are wise, so that we have the ability to pick up missions. The Army is working on some longer-range fires through their, either, PrSM or their other systems—precision strike missile. We both share information. In fact, I believe much of what we gain from ground-launched cruise missile, as the lead for the Department of Defense on that, will actually wind up being passed to the Army. It may be a little too heavy for us. One of the keys for us, as the littoral force, is the light, highly mobile force. We have to calculate how much stick we carry with us, versus how agile I have to—I can be, to get on board either aircraft or naval craft to move rapidly into and around the Pacific. A longer-range system may be ideal, but too heavy for me. So, as General Murray and I, as the Army and the Marine Corps, balance, coordinate, I'll have the shorter range, but more mobile; he would have longer range.

Senator HAWLEY. Got it.

I'm going to come back to a topic that you touched on with Senator Ernst, I think it was, the JADC2. Can you tell us more about the Marine Corps's role in the development of JADC2?

Lieutenant General SMITH. So, sir, the Air Force is actually developing the concept of JADC2. We'll do a—an experiment, here—the Air Force will conduct it, here, in about 3 weeks, out in Nellis. Each of the services will provide systems that they currently use. The key, here, for us, sir, would be that—the concept of joint all-domain command and control—any sensor, any shooter—what we want to have happen is, the systems which we already use to pass data, those radios, or whatever, systems, the form factors that fit each of the services and ignitions, have to be able to feed into that. So, the experimentation is, we will provide things, like perhaps V-22s or perhaps, in the future, an F-35, to make sure that the systems that we're procuring can feed that system, that data transmission is the key, sir, not a specific—any specific box or any specific thing that must feed JADC2. The services will all be able to do it with the systems that they have that meet—match their specific operational requirements. So, it's really data transmission, sir.

Senator HAWLEY. That's really helpful.

Mr. Secretary, do you want to add anything to that?

Secretary GEURTS. Yes, sir. I think, as General Smith said, we need to be careful this doesn't—you know, we issue everybody a unique box to operate on that network. That—one, that will be expensive; and, two, it will take a long time to get through all the aircraft integration and ship integration. I think the sweet spot we're looking for is, What are the standards and the architecture? Kind of like, you know, wireless, you don't have to have a different phone for every wireless network. That's the way we had to do it in the past, because technology, in the past, wouldn't allow you to

get there. So, there's an operating concept, and then we've got to mechanize it so it doesn't become either time- or cost-prohibitive.

Senator HAWLEY. That's helpful, thank you.

Thank you, Mr. Chairman.

Senator PERDUE. I'd like to follow up on two things. General Smith, you said the Marine Corps has to be light. I'm worried about the sealift. We talked about that before. In this new environment, particularly with China's development, where they've deployed more ships in the last 30 months than they have in the prior 30 years, seems to me that you guys are going to have to fight your way to the fight. It's encouraging you've already got forward deployed 21,000 in the first chain. I'm very interested in these anti-ship capabilities you have from the ground. The question—talk to me about the JLTV and how it plays into this, but also the range. The missiles that we have now, for the longer range that we know that China has off their ships to combat what you're trying to do, are we really going to have the range in this capability that you've been talking about, or is that going to have to come from airborne or another ship, I mean, to create that confusion?

Secretary GEURTS. Sir, and it, I think—we may well tag-team this one a little bit. What is unique—and, as you're seeing the Department pivot towards a competitive strategy—you know, on—in the past, the Navy and Marine Corps worked well together, but, you know, kind of, two sometimes separately-operating subsidiaries. What's changing in this strategy is, how do we leverage what the Marine Corps—they have access, they have placement—to have different effects and create more dilemmas for the enemy than just a pure competitive 1V1 strategy. So, you know, the length and missile ranges are important, but placement's also important.

Senator PERDUE. So, I wanted to follow up on that. I'm sorry to interrupt. But—

Secretary GEURTS. Yep.

Senator PERDUE. But, do you also leverage the other services' capability to—

Secretary GEURTS. Absolutely. So, JADC2—so, again, any sensor, any shooter can become—if you create that fabric, where any sensor can connect to any shooter, and I can have a—let's say, a—you know, a marine on the first island chain can get a target back to a DDG-51 with an SM-6 that's got a lot of range, or maybe a conventional prompt strike, you start really changing the geometry of the battlefield, and then it becomes less about comparing, "You have two of these, and I have three of these." Then it becomes the really integrated strategy. That's very, very different competitive strategy than a just red-versus-blue, you know, who can shoot first, who can shoot longer. Because now the complexity and the cost you impose can be exponentially increased without an exponential increase in resources.

Senator PERDUE. So, I'm very interested in the Nellis demonstration. It's the second one. We had one in December on a JDC2. But, I'm also concerned about how that integrates with ABMS, which is what the Air Force is really trying to do as a platform upon which you guys are going to sit. What are the top priorities that you're trying—from your position and responsibility, General, what are you most concerned about that? I understand the concept. I'm also

envisioning the vulnerability. I met with a bunch of your marines in Australia, 2 years ago. I asked them, "Well, what happens when you don't have GPS?" Said, "Sir, here are our physical maps. I mean, we—there are always contingencies." The thing I loved most about what he said, "Sir, we just will get it done. That's the marine way." So, can you talk to me about the vulnerabilities, as well as the joint platform and how the services are integrating right now? I asked each one of you service heads of what—of your responsibility at your level, What—how are you integrating with these other players?

Lieutenant General SMITH. Yes, sir. If I may also, briefly, sir. So, when—Secretary Geurts, when he was talking about the range, I would also say that a naval strike missile from the shore—what we're trying to do is cause intractable problems for an adversary. So, if you think that you're going to avoid an FFG or a DDG out in an open area in the sea, and you want to hug the coastline, that's probably not going to work for you now, with a force that can fire X-100 miles from the shore regarding the JADC2 concept, sir, and ABMS, the advanced battle management system. So, we are concerned that we not put all eggs into one basket and everybody have the same form factor, as you said, sir.

So, our concern with the overarching network, put all your eggs in one basket and then guard the heck out of that basket, we understand that we will be operating in a denied and integrated environment. There are times when we will be cut off from satellites, when we'll be cut off from GPS, we'll be cut off from PNT, precision navigation and timing. So, we are exploring—and I'll be cautious in this forum, sir, but we are exploring things that will now allow us to do terrestrially-based precision navigation timing, take it with you, establish it yourself. We've actually had that in the past, in the first Gulf War. It's very old technology, but the concept remains valid. Being able to take that with you so that I can produce something, when cut off, inside of the sphere I'm operating, that others could tie into—all that, sir, will tie back to the joint all-domain command and control.

Secretary GEURTS. Yes, sir. If I can just one—I mean, to show the power of where the Navy and Marine Corps team sees this, we've—this year, we've increased the S&T funding aimed towards the Marine Corps by 27 percent. So, we are—you know, this concept is so powerful, from our perspective. We are realigning resources to make sure we've got the technology we need to, to take this concept forward.

Senator PERDUE. Thank you.

Senator KAINE.

Senator KAINE. Great.

Thank you, to the witnesses, for your service and for being here today. I'm sorry I missed the first part of the hearing. I was at a Foreign Relations Committee hearing on Syria that was pretty intense.

Just a few questions. These may have been covered, but I do want to get into them.

Last week, I met in my office with a Virginia company, BWXT. They were recently awarded a contract, through the Strategic Capabilities Office, to explore building a small nuclear micro reactor in

the 1-to-5 megawatt range. The idea of these—this is looking at to sustain bases here in the United States or potentially for use in forward operating bases, but the idea is, you know, whether the Marine Corps is looking at the possibility of incorporating this kind of technology in any kind of a broader applicability, especially in remote island chains or places where, you know, energy is particularly difficult to deliver.

Secretary GEURTS. Yes, sir. I think—I'll—maybe that in two or three broader themes. We are absolutely looking—if we're going to operate effectively forward in small teams, you've got to be self-sustaining. So, whether that's power or water or whatever the resources you need, particularly in a contested environment, being able to logistically resupply, kind of, you know, red-ball, the way we've done it in some of our most—is not going to work.

Senator KAINE. Yeah.

Secretary GEURTS. I would say, you know, in the mini nuclear power, that's an emerging concept.

Senator KAINE. Right.

Secretary GEURTS. We'll certainly leverage it greatly as it matures. But, we are looking—you know, whether it's how to make ships more efficient, how to lighten the load so we don't have to move as much stuff forward, and then how to be self-sufficient, all very important to us.

Senator KAINE. That's great.

In your testimony—your written testimony, Secretary Geurts, you described, under a section on emerging capabilities, quote, “disruptive capabilities and expeditionary logistics.” I'm sure you've been asked, before I got in, about, you know, what kinds of things are you thinking about in this disruptive capabilities, what are some of the kinds of emerging technologies you're looking at that you think could help you?

Secretary GEURTS. So, some of it will be in this disruptive, self-sufficiency realm, some will be in disruptive ways to logistically resupply autonomous—rapid autonomous resupply. I think there's a whole host of things. Last year, we did four of these major experimentation exercises, where we bring out—we had 1700 participants—

Senator KAINE. Excellent.

Secretary GEURTS.—we bring out emerging technology and then put it in the hands of the users, and many times we found solutions or a problem we didn't know we had, and many times we found unique problems we need to think about.

I don't know, Eric, did you want to add to any of that?

Lieutenant General SMITH. Sir, I would just say, in the disruptive mode, if an adversary is expecting to see a certain supply chain, he's expecting to see battery, water, and fuel transport, because X-level—

Senator KAINE. Right.

Lieutenant General SMITH.—of transportation signifies X-sized unit and possible X-intentions. But, now I'm doing that on my own, which, I've said before, we're doing some work with Johns Hopkins Applied Physics Lab in malleable batteries and the ability to generate power with a little bit of water and a little bit of heat, and then sustain that. When I was at the 3rd Marine Expeditionary

Force last year, we had simple things, additives for gas so you can turn what we would—you'd never put in your vehicle here, but that's available in, perhaps, a less-developed nation, that I can add to that and make that fuel usable in our vehicles, the ability to pull water—obviously, we have desalinization capabilities, reverse osmosis water purification units. Those kind of things cause a different signature. We talk about signature management a lot, sir, for how you come electronically. There's a couple of kinds of signatures. There's electronic, and then there's physical.

Senator KAINE. Right.

Lieutenant General SMITH. We're doing things to challenge both of those and shrink them so we appear different than we actually are.

Senator KAINE. One of the questions, General Smith, I wanted to ask you—it's kind of in this innovation area. As you're looking at innovation, there's also, sort of, new ways of fighting. As you explore that, is it likely that the Marines may train in new environments? You know, you have such great, sort of, fixed training bases that serve so many wonderful purposes, but, as you're looking at the possibility of future fights being a little bit different, do you have the training infrastructure you need, or are you looking at new or different training environments?

Lieutenant General SMITH. So, Senator, I truly do appreciate that question. The Commandant's vision—and he started last year with this particular budget—internally, he reprioritized, when he became Commandant in July, for a budget that was somewhat fixed by the time he became Commandant, a few hundred-million dollars, and focused it on training and education under the leadership of a guy named Major General Bill Mullen, who has a lifetime in training and education. What we've done is, we've begun to train those individuals, those marines and officers, now so that when they receive these capabilities—longer-range precision fire or new technologies—they can actually use them.

Senator KAINE. Right.

Lieutenant General SMITH. They can do virtual constructive training, which we coordinate pretty closely with the Army on, so that we can tie simulators together, so that we can have our ranges all instrumented, so we can do playback. You shouldn't have to run the range 47 times if you can run it a couple and then watch the films, as any professional athletic team—

Senator KAINE. Right.

Lieutenant General SMITH.—does. We're working and doing that out at 29 Palms. We can always use more range space, because there is a point, as you know, Senator, where a marine does have to get behind a Javelin antitank—

Senator KAINE. Right.

Lieutenant General SMITH.—missile and fire it, and so, we're always conscious of both the noise we make and—et cetera, on ranges. But, we still need those instrumented ranges. If that answered your question, sir.

Senator KAINE. Yeah, it does. Thank you.

Secretary GEURTS. Yes, sir. I just—you know, in innovation, sometimes we get too focused on discovery. A key to a really effective application of technology is the absorption rate.

Senator Kaine. Right.

Secretary GEURTS. So, these new ways to be able to absorb technology faster, train it, create the tactics, and make it useful is critically important.

Senator Kaine. Thank you. Appreciate it.

Thanks, Mr. Chair.

Senator PERDUE. Thank you, Senator Kaine.

Senator Blumenthal.

Senator BLUMENTHAL. Thank you, Chairman.

Thank you both for being here today, and for your service and the service and sacrifice of all of our marines.

I want to start by offering my condolences to the families of the two marine Raiders that were killed this week in support of Operation Inherent Resolve. Gunnery Sergeant Diego Pongo and Captain Moises Navas died Sunday while they were serving on a partner mission with Iraqi forces south of Irbil in Iraq. Last year at this hearing, we discussed a report that questioned whether MARSOC was still a relevant force. Now, a year later, I would submit that the sacrifice and actions of these Marine Corps Raiders, like Captain Navas and Gunnery Sergeant Pongo, demonstrate exactly the opposite of irrelevance and show the fallacy of opinions saying MARSOC is irrelevant.

I am a staunch supporter of MARSOC—I remain a staunch supporter—and its continued contributions to our national security, and I hope that officials at the Department of Defense will share that view.

I would like to ask about female body armor. We've discussed this issue from time to time. General Smith, I wonder if you could provide an update on the Marine Corps efforts to design, develop, procure, and sustain this kind of protective gear for women. As you well know, the Marine Corps has been at the lead and the forefront of efforts to expand opportunities for the dedicated women, as well as men, who come forward to serve the country. I introduced the Female Body Armor Modernization Act, along with my colleague Senator Ernst, Senator Duckworth, McSally, which would improve equipment for our female warfighters. I wonder if you could give us an update.

Lieutenant General SMITH. Sir, I can. As I've said earlier, Major General Dan Yoo, who's the commander at MARSOC—not here today, but Dan's a good friend, and he would very much appreciate your comments, and as do we all, sir, on the two Raiders.

Sir, you know, body armor—one of the things that I'll start this with—and I've stated this before, as the father of a marine, and I'll tell young marines, "I care about your comfort, but I care about your protection and survivability a whole lot more than your comfort." So, what we've done, sir, is, we've gone from what we used to consider—we call it "5 to 95"—we would try to fit every marine from the 5th percentile to the 95 percentile. Because we've got some really, really big marines, and we've got some really small marines. In fact, we just commissioned Hershel Woody Williams, who was not allowed to go to the Marine Corps, even though a Medal of Honor Recipient on Iwo Jima, because he was too short. So, some of our small-stature marines, doesn't always mean

women. I mean, smaller. Again, Woody was not allowed to join the Marine Corps until they lowered the height standards.

We've gone to 2 and 98, so we've taken those who don't—just by formfitting, sir, not just small, medium, large. We have to be a little be a little more creative and conforming. We've gone from 15,000 who were—fell outside the 5-to-50—5-to-95—down to about 3300; 297, exactly, are—as of today—are below—we can't best-fit on the small-stature marines. So, we've really shrunk down the number of marines, large and small stature, who are not best-fitted, just by modifying our outer tactical vests, our plate carriers.

The one thing that I just spoke to General A.J. Pasagian about, who's our head of Systems Command, is, we are working with moving from ceramic to a plastic. Because the ultimate goal, sir, is conformal body armor. Conformal would mold to anyone's body style. That's a pretty big lift, at this point, sir, to still provide protection against multiple strikes. We have not gotten there, sir, but we have not stopped experimenting. But, the sizing factor has taken us from, again, 15,000 who were outside, down to about 3300, 297—frankly, most of which are female—but, 297 of our shortest-stature marines are now outside that, down from about 2500. I take the number—I'll take for the record, sir, on the number, but it is now 297.

Senator BLUMENTHAL. Yeah. If you could provide any more information you think is relevant, take——

Lieutenant General SMITH. Absolutely, Senator.

Senator BLUMENTHAL. You know, Senator Kaine and I are both fathers of marines. I don't know whether he's mentioned that. But, I really first became aware of this body armor issue when my own son was serving in Helmut Province and came to learn that our male marines did not have body armor protecting them below the waist, and worked very hard with then-Secretary of Defense Ash Carter to make sure that that body armor was delivered more expeditiously so that marines in the field would be better protected. I know that the Marine Corps has been very attentive to this issue for both males and females. I thank you for that focus, because you're absolutely right, comfort is not the objective in these situations. Obviously, mobility and dexterity and agility are. I think our military has been at the forefront of this effort.

I'm going to submit, for the record, some questions on the CH-53K. I know you're on top of that, Secretary Geurts, and as you are, Lieutenant General Smith. I very much appreciate your being here today and answering my questions.

Thank you.

Secretary GEURTS. Yes, sir. Just briefly—and happy to answer your questions—53K has really made a lot of progress over the last year. A lot of hard work by the marines and by the contractor and by our team, and so, I'm very happy with the progress that program has made over the last year.

Senator BLUMENTHAL. Well, I think that aircraft could be, you know, enormously beneficial in so many areas. I'm thankful that we're making progress.

Thank you.

Senator PERDUE. Senator Hirono.

Senator HIRONO. Thank you.

Secretary Geurts, I was very interested in your discussion about your integrated strategies. Is it that—China, one of our near-peer competitors, they have numbers of assets that we can't keep up with, in terms of—or we can't match, I should say—even if our technology is better with regard to our planes and ships, et cetera. So, is this one of the reasons that you are pursuing this integrated strategy on realigning your resources?

Secretary GEURTS. Yes, Senator.

Senator HIRONO. So, this is a relatively new kind of a process that your strategy—you're pursuing?

Secretary GEURTS. It is. I mean, we've always been joint, previously, and the Navy and the Marine Corps have worked well together. But, when you're in a competitive situation, you're really trying to be competitive, and, to use one of Senator Perdue's terms, you're competing uphill versus competing downhill, you are looking for every opportunity. You've got an abundance mindset, and so, we have an abundance of marines in the first island chain. Why are—you know, how do we maximize that abundance to the greatest effect for the overall team, not just to make them successful? How do they become part of something larger? Likewise, if the Navy's got a Navy strike missile, we have a—we've already done that, we can hand that over. Or if the Army's building a JLTV, we can leverage that. So, it's really leveraging opportunities and taking a really competitive mindset, as opposed to a preventative mindset.

Senator HIRONO. So, in order to pursue your integrated strategies, it requires a lot of coordination across the services. So, what would be a—what are some of the challenges—major challenges you face in trying to get everybody on the same page and to maximize your capabilities?

Secretary GEURTS. I'll speak some and invite General Smith.

I mean, a lot of it's—you've got to be transparent, right? You've got to create relationships so that you can identify the opportunities on the front end, not trying to engineer them on the back end. Because once programs are set and requirements are set and, you know, you've got a program director, that becomes very challenging. On the other hand, like JLTV, if the Army is going to make that investment, we have a couple of unique requirements for the Marine Corps. If we work those in early, not a big deal. If you try and engineer them in after the fact, could be a bigger deal.

Senator HIRONO. So, when you talk about relationships, at what level are you talking about, relationships?

Secretary GEURTS. I would say at any, but maybe General Smith can talk about, in his relationship, particularly with the Army, on the marine ground equipment.

Senator HIRONO. General?

Lieutenant General SMITH. Yes, ma'am, very briefly. So, General Murray, at Futures Command, and his deputy is a guy named Lieutenant General Eric Wesley, who's down in Suffolk, Virginia. We're coordinating and then, at the one-star and colonel level, it's daily. So, for a very small example, ma'am, the joint light tactical vehicle, our requirement to place a vehicle in what we call "forward V," forward vehicle storage on an amphibious vessel, 96 inches. If you're taller than 96 inches, you don't fit. So, when you do that requirement with the Army, that is hard and fast, because we're not

moving steel. When we tell the Army that up front for joint light tactical vehicle—truly joint—the Army says, “Okay, maybe they wanted something that goes to 110 inches,” but we cooperate and collaborate down to 96 inches. High mobility artillery rocket system, we fire the exact same missiles, the same sled, the same vehicle. Those are the kind of things that, as we coordinate early, everything from modular handgun to body armor to the future squad weapon, all that has to be discussed before you go into, kind of, low-rate production. We’re doing that on all those systems—ammunition. Those are hugely helpful. Those systems, those relationships are literally at the program manager through the three- and four-star level on a daily-up-to-quarterly basis at the senior level.

Senator HIRONO. I appreciate that. It’s not easy for services that pretty much were much more self-contained to now be having to—I suppose, to be transparent about what the larger goal is—

Secretary GEURTS. It’s codependence. You have to get comfortable with codependence. That’s—

Senator HIRONO. Yes.

Secretary GEURTS.—not generally—and you have to have an air of humility. We have to set the example from the top all the way down to the bottom, and hold that standard.

What I would say is, though, with a mission mindset, and everybody is—if it’s about competing and our national security, that is the number-one thing that will overcome human natural instinct to want it, own it all, and create the idea themselves.

Senator HIRONO. I think that’s the kind of change, basically, that I’d really like to see, not only described, but being effective.

So, as we talk about modernizing the—your equipment and your military platforms, I found the discussion about body armor very interesting, because I don’t know who helped you to develop—I’m looking at the General now—develop this kind of new armor to fit the—and, you know, all of the new technology that you are having to go to. So, I take it that you are much more involved with the private sector, partnerships with small businesses, et cetera, to come up with the innovations that you’re seeking. So, is that a—is that happening?

Lieutenant General SMITH. Yes, ma’am. I’ll pass Secretary Geurts on the partnership with industry, but General Pasagian and his people that work down in Quantico—when I go to a town-hall and discuss with them—there’d be a few hundred people, and I’ll ask them, “If you’ve got to—if you have somebody in the Marine Corps that you love—a son, a daughter, somebody you love—raise your hand.” There’s always 30, 40, 50 hands go up, and so, they’re committed, and they—as Senator Kaine, myself, Senator Blumenthal, we have children in the Marine Corps. Now there’s skin in the game. People are committed to finding the solution that best protects the lower-body-extremity armor that was produced by Dr. Carter as the SECDEF, those kind of things.

But, I’ll defer to Secretary Geurts on the industry piece.

But, we’re being as creative as we can, because—I mean, those are our marines. We have to—we can’t let going home at 4 o’clock change some lance corporal who’s out there right now on the first island chain just saying, “Man, I wish I had a better piece of equip-

ment.” They get that. They’re committed to it. If they weren’t, in all candor, I’d get rid of them.

Senator HIRONO. Just very briefly, because I have run out of time.

Secretary GEURTS, are you actively pursuing these kinds of partnerships, in terms of—

Secretary GEURTS. Absolutely. We talked about our—

Senator HIRONO.—looking to them—

Secretary GEURTS.—exercises. Happy to—

Senator HIRONO.—technologically—

Secretary GEURTS.—last year, we had \$16 billion that went directly to small business out of the Department of the Navy, a—biggest small-business year we’ve had. So, they are a driver of innovation. It’s up to us to create the relationships and the business processes that leverage them.

Just briefly, on the Small Business of Innovative Research. We’ve been working on that end-end process, because the small business—getting cash fast is really important. We take in our 128 day from idea to on contract right now. We’re going to 28 days. If we can get to that kind of responsiveness, then we’ll become an attractive place to do—

Senator HIRONO. Yes.

Secretary GEURTS.—business for these smaller innovative companies.

Senator HIRONO. Thank you.

Thank you, Mr. Chairman.

Senator PERDUE. Senator Kaine.

General, you know, it’s hard to look at the Ukraine and Syria, Iraq, Yemen, and these active hotspots around the world, and you see a lot of new things happening in close combat, like tandem warhead RPGs, you know, highly advanced antitank capabilities of our adversaries. You’ve got to believe some of this is Russia finding its way in there. Maybe Iran. But, whatever, how does this threaten, you know, the anti-armor—or the armor upgrade packages for the M1A1, the LAVs, and the new ACVs? I mean, what are we doing to adapt to this increasing capability of these—what we see already in the current battlefields out there?

Lieutenant General SMITH. So, sir, we coordinate very closely. The Army normally has the lead for what we call APS, active protective systems, things that, when an RPG is fired at any vehicle—it doesn’t even have to be an armored vehicle—could defeat an inbound round, an inbound warhead, or an inbound larger-caliber round. So, we do coordinate with them. I will say, though, sir, for us, as the lightest force, when you start getting to active protective systems on vehicles, adds a significant amount of weight. That weight is always a concern. As you—agility, mobility is also a protective mechanism for us. So, the ability to move quickly to go where you are not expected to go causes the enemy to have to, again, change and look at the entirety of the battlefield, vice, “Well, he’s so heavy, he’s going to be on this road, so we can mine this road or focus on this road.” If I can be anywhere, that really does spread it out, sir.

Senator PERDUE. We really aren’t changing much on the ACV to accommodate these adaptations we see in it currently?

Lieutenant General SMITH. Sir, I would say that we're always looking for a system that is light enough to be employable, to give protection, but there will come a point, sir, if we continue to add, we would turn the amphibious combat vehicle into an amphibious tank—

Senator PERDUE. Yes, sir.

Lieutenant General SMITH.—and that would be untransportable to shore, it would not mobile enough to suit our needs. So, it's a constant—you know, historically, sir, it's the Knights at Agincourt. You don't want to be so heavy you can be knocked off your horse and killed by a pike.

Senator PERDUE. The reverse question, obviously, is, Russia and China are both dealing with this same issue in reverse. The active protection system—it looks like Russia's really doing a lot more research, and you see some of that in the field already. Are we doing—are we trying to—obviously, we are, but, I mean, what are we doing to try to keep up with their increase, you know, protection of their big vehicles, as well?

Lieutenant General SMITH. So, sir, I would tell you that we're constant—I would say, in the—in this setting, sir, I would say we are constantly looking for munitions that will defeat active protective systems. Openly, sir, we can say everything from the timing of multiple rounds going in to the methodology by which that round impacts and spreads its kinetic energy, we're looking at that all the time, and experimenting, sir. That's—respectfully, sir, I probably wouldn't go a whole lot further—

Senator PERDUE. Yes, sir.

Lieutenant General SMITH.—here.

Senator PERDUE. I understand.

Lieutenant General SMITH. But, be happy to come back in a other setting, sir—

Senator PERDUE. Yes, sir.

Lieutenant General SMITH.—and show you what we are working with.

Senator PERDUE. We may well try to do that, and combine that with the Navy. We have another need to do it on the Navy side, too, particularly with regard to the ranges and the lethality of the weapons, because that really does affect the number of our ships and submarines that we actually have to have. This 355 number keeps popping up, but our increasing lethality and the way that we fight the force is changing so dramatically in this current NDS strategy.

That's all I have, Senator Hirono.

I want to thank Secretary Geurts and General Smith. Thank you so much for your candor and, obviously, your professionalism in answering these questions. If there were questions, if you'll just submit it to the committee, that would be greatly appreciated.

With that, we stand adjourned. Thank you.

[Whereupon, at 11:13 a.m., the Subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEANNE SHAHEEN

EXPEDITIONARY FAST TRANSPORT SHIPS (EPF)

1. Senator SHAHEEN. Secretary Geurts, we frequently hear about the how it is team effort for the Navy and Marine Corps to operate efficiently and effectively around the world. I know this hearing was held to discuss Marine Corps ground modernization, but I would like to hear your thoughts on how we quickly move Marine Corps assets to where they are needed.—It does not do anyone any good to spend money on modernizing Marine Corps ground assets if we cannot get them to the fight.—Can you comment on the Navy's plans to ensure it has the maritime mobility assets required to effectively move this modernized force to where it is needed including traditional amphibious ships, smaller agile expeditionary fast transport ships (EPFs) and other non-traditional assets?

Secretary GEURTS. The Navy's Amphibious Ready Group (ARG), comprised of amphibious warships with an embarked Marine Expeditionary Unit (MEU), is the cornerstone of maritime mobility for the Marine Corps. The ARG carries a modernized force and possesses the ability to respond quickly to Combatant Commanders' needs. In addition to the ARG/MEU mobility construct, the Navy provides other platforms for current strategic lift and support in littoral environments, as well as developmental programs for mobility needs for Expeditionary Advanced Base Operations (EABO). The amphibious fleet was designed to support large-scale Marine Corps combat operations in the littorals. The Marine Corps' Force Design efforts are changing what the equipment-set and personnel requirements of the Corps will look like in order to achieve National Defense Strategy and Title 10 responsibilities. As such, our supporting vessels such as amphibious warships, EPF, ESBs, MPF, and LAW are all necessary to meet the demands of a more technological, agile, expeditionary, and lighter Marine Corps.

2. Senator SHAHEEN. Secretary Geurts, can you address the EPF that was cut due to reprogramming and provide a preview of what might be included in the Navy's new force structure assessment?

Secretary GEURTS. In determining the sources for the reprogramming, the Department of Defense used a deliberate and objective approach to select programs that were considered to be either early or excess to need, particularly if not requested in the Fiscal Year 2020 President's Budget. The EPF ship added to the Fiscal Year 2020 President's Budget was determined to be in excess of programmatic need and therefore identified as an offset for the reprogramming. On February 27, 2020, the Secretary of Defense directed a DOD-level comprehensive review and analysis of the Navy's future fleet force structure. Additional wargames, simulations, and detailed analyses will be conducted over the coming months looking at all types of platforms, and those results will be provided to the Secretary of Defense in the summer.

ENHANCED NIGHT VISION GOGGLE-BINOCULAR (ENVG-B):

3. Senator SHAHEEN. Lieutenant General Smith, as the USMC continues to modernize its ground forces to maintain combat overmatch capability in a rapidly evolving threat environment, I am particularly interested in how you are modernizing the capabilities of the individual marine.

As you may know, under the Enhanced Night Vision Goggle-Binocular (ENVG-B) program, the Army is accelerating deployment of dual-tube image intensified, thermal imagery fusion display goggles that integrate rapid target acquisition and augmented reality to provide ground forces with unprecedented situational awareness and combat effectiveness. Under a three-year contract awarded in 2018, the Army is procuring an initial order of approximately 10,700 ENVG-B systems in support of a Directed Requirement. Within that contract, there is provision for the USMC to procure approximately 3,200 ENVG-B systems, as well.

I am advised that the USMC is not utilizing this contract authority to procure high performance, cost-effective ENVG-B systems and has instead embarked on a path to procure a system known as the Squad Binocular Night Vision Goggle (SBNVG), which I understand is a lower performance, less capable option that will be fielded later than ENVG-B.

Against this backdrop, I am concerned that by foregoing procurement of ENVG-Bs, the USMC is missing an opportunity to fully leverage an existing production line and state of the art technologies in an integrated system that would best promote the safety, security, and combat effectiveness of our marine ground forces.

I would appreciate it if you would personally review this matter and provide the Committee with a detailed response as to why the USMC is not procuring the ENVG-B system and instead procuring SBNVG systems. Your response should in-

clude an assessment of the respective system capabilities, acquisition objectives, timelines for deployment, and cost effectiveness analyses.

Lieutenant General SMITH. The Marine Corps made a resource and capability informed decision to procure the Squad Binocular Night Vision Goggle (SBNVG) as the most mature, capable, and readily available system to provide an immediate and significant improvement to night vision capabilities for our infantry marines. At the same time, the Marine Corps is participating in and providing significant support to the Army's development of the Enhanced Night Vision Goggle-Binocular (ENVG-B) and the Integrated Visual Augmentation System (IVAS). We view the SBNVG as a bridge capability to the more advanced capabilities that will be provided by the Army systems once mature. The majority of our marines within the rifle squads are still utilizing the AN/PVS-14 monocular night vision device that was first fielded in 1996 and last fielded in the mid-2000s during the height of Operation Iraqi Freedom. This device has become antiquated with commercially available devices providing a more than 40 percent increase in performance. The Marine Corps received \$217 million (\$43.4 million each year fiscal year 2019– 2023) from the OSD Close Combat Lethality Strategic Portfolio Review to rapidly procure and field a modern night vision capability by leveraging commercially available technology. Squad Binocular Night Vision Goggle (SBNVG).

- The SBNVG is a white phosphorous, dual tube, image intensified binocular goggle with overlay thermal fusion provided through an Enhanced Clip-On Thermal Imager (ECOTI). The thermal capability provides night vision in blackout conditions and enhances target detection. Feedback from experimentation demonstrated that the SBNVG provides increased individual and small unit mobility with the dual-tube BNVG and increased target detection with the thermal fusion from the ECOTI.
- The Marine Corps adopted the USSOCOM Visual Augmentation System and Enhanced Clip-on Imager Capability Production Documents as our service foundational requirement for an improved night vision capability.
- Leveraging a fully mature, combat proven (in use by USSOCOM), and readily available capability, the initial solution procured was the AN/PVS-31A with white phosphorous image intensified tubes and the ECOTI. During fiscal year 2019, Marine Corps Systems Command (MARCORSYSCOM) utilized a limited, accelerated procurement effort utilizing DLA contracts to field over 1,260 PVS-31A's with ECOTI devices to two infantry battalions, 2nd Battalion, 8th Marines and 2nd Battalion, 5th Marines, in order to provide each marine within the rifle company and their engineer platoon with an improved night vision capability that significantly increases their lethality and night time mobility. An additional 40 systems were fielded during fiscal year 2019 to School of Infantry-East in support of the High Performance Track Program of Instruction.
- In Sep 2019, MARCORSYSCOM awarded a follow on, IDIQ contract for \$249 million to Elbit Systems of America—Night Vision (previously Harris Corporation) to procure up to 17,000 additional SBNVG in order to equip all Active Duty rifle companies, combat engineer squads, recon platoons, and MARSOC teams with the improved night vision capability. This system has a unit cost of \$13,970. In fiscal year 2020, 1,285 SBNVG systems will be fielded to two additional infantry battalions. In fiscal year 2021, 3,295 SBNVG systems will be fielded to five more reinforced infantry battalions and one reconnaissance company. Including the initial systems fielded in fiscal year 2019, a total of 5,840 SBNVGs supporting 9 infantry battalions and a reconnaissance company will have been fielded by the end of fiscal year 2021. In the meantime, the Marine Corps continues to participate with the U.S. Army on the development of future night vision capabilities. Enhanced Night Vision Goggle-Binocular (ENVG-B).
- ENVG-B is a white phosphorus, dual tube, night vision goggle with digitally-fused thermal sensor capability. The battery pack contains a processor that provides augmented reality to the goggle (situational awareness and thermal rifle scope sight in field of view) via wireless signal from the digital C2 device and the thermal rifle scope.
- The Marine Corps' SBNVG provides the same night vision and target detection capability as the ENVG-B as both systems use the same image intensified tubes and thermal sensors. The SBNVG provides the capability via manual overlay fusion (the thermal sensor clips on and can be removed when not needed). The thermal sensor in the ENVG-B is permanently integrated and digitally fused with the image intensified display. Although the SBNVG can provide an augmented reality capability through the battery pack via the ECOTI, the Army's ENVG-B will have greater technical growth because it is a fully digital system, which better enables insertion of augmented reality data.

- US Army Chief of Staff signed and approved the Enhanced Night Vision Goggle-Binocular (ENVG-B) Directed Requirement based on an urgent and compelling need for 10,000 systems at \$235 million (\$22,312.82 per system). A sole source contract award to procure the 10,000 systems was awarded on 14 June 2018. The Marine Corps supported the Army's development and user evaluations for the Directed Requirement systems with the numbers of marines requested by the Army. We also tracked the programmatic details of this effort via the Army's program office and continued participation in the Army's Soldier Lethality Cross Functional Team (SL CFT).
- In September 2019, the US Army achieved First Unit Equipped by fielding 27 systems from the sole source, directed requirement contract to 1st Infantry Division (Ft Riley, KS). These systems are an initial increment of the ENVG-B capability and will differ from the final configuration being pursued in the Army's ENVG-B program of record effort.
- In 1QFY19, the Marine Corps procured 195 of the Directed Requirement ENVG-B systems (one reinforced rifle company) on the initial sole source contract in order to conduct a side-by-side evaluation with the SBNVG to assess the ENVG-B system's capabilities. The Marine Corps is scheduled to receive the 195 ENVG-B systems in 4QFY20 and plans to conduct an evaluation in 1QFY21.
- For the ENVG-B program of record effort, the Army is executing a developmental contract with L3Harris and Elbit Systems of America for up to approximately 90,000 systems (\$1.1 billion), with a planned First Unit Equipped in 2QFY22. The Marine Corps is fully supporting this effort as well through marine participation in development and evaluation events. We will then use the results of the evaluation of the Directed Requirement ENVG-B and the information provided from the program of record effort to inform a future Marine Corps decision on procurement of the fully matured ENVG-B program of record solution. Integrated Visual Augmentation System (IVAS).
- In 2019, the U.S. Army awarded a contract to Microsoft to support a 24-month rapid prototyping effort for an end user, multi-domain device that incorporates advanced situational awareness, miniaturized night vision, synthetic training environments, and artificial intelligence capabilities to increase the lethality of close combat personnel. As envisioned, IVAS will provide a significant leap in capability over what is provided by SBNVG and ENVG-B. The Marine Corps is an active participant in the rapid prototyping efforts with the U.S. Army and has provided 20 percent of the total number of participants in IVAS events to date such as user studies, user juries, and soldier touch points.
- The Army is planning to begin fielding an initial increment of the IVAS capability in late fiscal year 2021. Way ahead.
- During fiscal year 2020, the Marine Corps will continue to procure and field SBNVGs in order to provide an immediate improved night vision capability to our close combat personnel.
- At the same time, the Marine Corps will continue to participate in and assess the ENVG-B and IVAS solutions for maturity, suitability, and affordability to meet our operational requirements in order to inform a decision on if, and when, to shift procurement from SBNVG to one of these improved capabilities.

QUESTIONS SUBMITTED BY SENATOR RICHARD BLUMENTHAL

FEMALE BODY ARMOR

4. Senator BLUMENTHAL. Lieutenant General Smith, can you provide an update on the Marine Corps efforts to design, develop, procure, and sustain PPE specifically designed for women?

Lieutenant General SMITH. The Marine Corps fits our female marines with the best personal protection equipment (PPE) available. The Plate Carrier (PC) is the primary body armor system for the Marine Corps, fielded in 2011.

Fit studies conducted by the Marine Corps throughout 2015 and 2016 showed that marines and soldiers (both female and male) preferred the Marine Corps' PC to the Army's Improved Outer Tactical Vest (IOTV)/Female IOTV (FIOTV) in form, fit, and function. The Marine Corps started development of the Plate Carrier Generation III (PC Gen III) in 2015 to reduce weight and improve the fit and mobility of PPE for the individual marine. The Army subsequently moved on from the FIOTV in 2016 with the fielding of the IOTV Gen IV as females rated it more acceptable when compared to the FIOTV. The IOTV Gen IV is nearly identical in design to the PC Gen III. Concurrent to the development effort of the PC Gen III, the Marine Corps re-

leased an update to its fit attribute from the 5th to 95th percentile marine to the 2nd percentile female marine to the 98th percentile male marine. This change included approximately 15,000 additional marines and encompassed all but 249 of the smallest marines and 3,394 of the largest marines.

To meet the updated fit attribute, the PC Gen III has eight vest sizes available (XS, XS-Short, S, S-Short, S-Long, M, L, XL) for the varying height of marines and three cummerbund sizes (SM, MD, LG) to accommodate different waist circumferences.

Additionally, the PC Gen III provides the following system improvements over the legacy PC:

- 25 percent lighter with same soft armor coverage and increased ballistic protection.
- 1.5" shorter by removing excess material around the lower waist providing greater mobility to short stature marines.
- Excess bulk and material removed in shoulders to provide a better rifle stock weld for shooting.
- Additional padding added in upper chest, deltoids, and top of shoulders to improve comfort.
- More adjustment capability in shoulders, Side SAPI placement, and waist circumference to allow for more customized fit.
- Provides integrated inner vest and load bearing rig capability to support vehicle crewman, reconnaissance, and military police.

In addition to increasing the number of available sizes in the latest Marine Corps plate carrier, the Marine Corps developed a Lightweight Plate (LWP) as an alternative to the Enhanced Small Arms Protective Insert (ESAPI) for protection against small arms threats. The LWP reduces the weight of the ballistic plates by almost half when compared to the ESAPI, significantly improving mobility while providing similar protection levels. The Marine Corps also adopted the Army's H-back style Improved Retention System (IRS) for the Enhanced Combat Helmet thereby providing better compatibility for females with hair buns. The IRS improves overall comfort, stability, and adjustability for the marine.

5. Senator BLUMENTHAL. Lieutenant General Smith, what is the timeline for getting this vital equipment to the marines that need it?

Lieutenant General SMITH. The Marine Corps is currently fielding the new plate carrier and achieved Initial Operational Capability (IOC) in November 2019. The Light Weight Plate is undergoing First Article Testing and is expected to achieve IOC by December 2020. The Improved Retention System replaced the original X-back retention system for the current Enhanced Combat Helmet (Gentex). The Gentex contract was awarded in May 2017. FOC is scheduled for July of 2020. Currently, the Marine Corps is funded to procure approximately half of the required inventory to equip the force. The priority of fielding is to infantry and infantry-like units. As females integrate into these units, they will receive this specific equipment set. The Marine Corps is pursuing the funding necessary to field the improved plate carrier across the force and will continue procurement as funds are received. The Marine Corps has multiple contracts in place that allow for the full procurement of the new plate carrier and LWP. The contracts expire in September 2023 and June 2024, respectively.

Also, as legacy PPE depletes out of the inventory and sustainment stocks increase via Defense Logistics Agency support, units outside of the infantry will receive the new plate carrier, to include female members of those units.

6. Senator BLUMENTHAL. Lieutenant General Smith, what additional support do you need from Congress to address this issue?

Lieutenant General SMITH. Congressional support for continuously improving protection for our marines is always welcome. Stable funding and continued emphasis with industry on supporting DOD efforts to develop improved materials and designs for PPE are the areas that would be most beneficial.

7. Senator BLUMENTHAL. Secretary Geurts, can you update me on the actions you have taken to address the female body armor issue for our marines?

Secretary GEURTS. The Marine Corps fits our female marines with the best personal protection equipment (PPE) available. The Plate Carrier (PC) is the primary body armor system for the Marine Corps, fielded in 2011. Fit studies conducted by the Marine Corps throughout 2015 and 2016 showed that marines and soldiers (both female and male) preferred the Marine Corps' PC to the Army's Improved Outer Tactical Vest (IOTV)/Female IOTV (FIOTV) in form, fit, and function. The Marine Corps started development of the Plate Carrier Generation III (PC Gen III) in 2015 to reduce weight and improve the fit and mobility of PPE for the individual

marine. The Army subsequently moved on from the FIOTV in 2016 with the fielding of the IOTV Gen IV as females rated it more acceptable when compared to the FIOTV. The IOTV Gen IV is nearly identical in design to the PC Gen III. Concurrent to the development effort of the PC Gen III, the Marine Corps released an update to its fit attribute from the 5th—95th percentile marine to the 2nd percentile female marine to the 98th percentile male marine. This change included approximately 15,000 additional marines and encompassed all but 249 of the smallest marines and 3,394 of the largest marines. To meet the updated fit attribute, the PC Gen III has eight vest sizes available (XS, XS-Short, S, S-Short, S-Long, M, L, XL) for the varying height of marines and three cummerbund sizes (SM, MD, LG) to accommodate different waist circumferences. Additionally, the PC Gen III provides the following system improvements over the legacy PC:

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EXPEDITIONARY ADVANCED BASE OPERATIONS

8. Senator BLUMENTHAL. Lieutenant General Smith, I am encouraged by the Marine Corps' focus on great power competition and its efforts to support distributed maritime operations. The Commandant outlined a framework that will allow the Marine Corps to successfully support distributed maritime operations in his planning guidance stating that the Marine Corps, "Must develop capabilities to facilitate sea denial and sea control by forward postured or deployed naval expeditionary forces with sufficient resilience." I agree, and I am interested in better understanding the capabilities necessary to successfully conduct Expeditionary Advance Base operations. In discussions about Expeditionary Advance Bases you have spoken about the desire to move relatively small and maneuverable units rapidly with long range precision fires capabilities in a C2 degraded environment. What capability gap concerns you the most when you think about this concept of employment?

Lieutenant General SMITH. As articulated in our budget submissions, the Marine Corps has gaps in several areas critical to our ability to facilitate sea denial through expeditionary advance base operations (EABOs). Our most pressing needs include expeditionary long-range precision fires; medium-to long-range air defense systems; short-range air defense systems; and high-endurance, long-range unmanned systems with intelligence, surveillance, and reconnaissance, electronic warfare, lethal strike, and logistics capabilities. However, above all, our most critical gap is a lack of maneuverability and mobility within key maritime terrain. Closing this gap requires smaller, lower signature and more affordable amphibious ships and distributable platforms that enable littoral maneuver and provide logistical support in a very challenging theater for the kind of operations envisioned in our current concepts. The Marine Corps' Force Design 2030 report, which was issued in March 2020, identified mobility inside the adversary's long-range precision fire weapons engagement zone (WEZ) as a critical competitive advantage and, as such, an operational imperative. Specifically, this capability provides the following critical functions central to the success of EABO concepts:

- Smaller, low signature amphibious ships provide the means to rapidly and effectively deploy distributed forces over operationally relevant distances (e.g., up to 1,000 nautical miles) into key maritime terrain. This type of low-observable operational maneuverability is critical to the establishment of expeditionary ad-

vance base sites by an initial blunt force against rapidly escalating enemy actions.

- Once deployed, these smaller amphibious platforms enable EABO forces to move seamlessly through littoral terrain (avoiding being targeted by the enemy while continuously holding enemy capabilities at risk). Just as importantly, they also provide EABO forces the means to endure for long periods of time without external sustainment.

The crucial nature of this capability shortfall cannot be understated. These smaller, low signature, more affordable amphibious ships enable marines conducting EABO to persist and thus remain effective as a blunting force inside the adversary's WEZ. While this capability is not organic to the Marine Corps, it is central to our ability to contribute to sea control and sea denial in a contested littoral environment. Finally, the CH-53K will play a vital role to bridge the gap between our Naval Surface Craft and Marines operating in distributed environments throughout littoral regions.

9. Senator BLUMENTHAL. Lieutenant General Smith, you mention several initiatives in your testimony such as new radars and mobile data networks, but could you expand upon how you plan to improve ground based situational awareness tools that will allow for Marines at an Expeditionary Advance Base, operating in a degraded C2 environment, to have the battle field awareness engage a target at 350NM?

Lieutenant General SMITH. Both current and future operating environments are highly dependent upon a large number of sensors that facilitate persistent wide area surveillance, point target collection, monitoring of maritime avenues of approach, force protection, and pattern of life development. In addition to the substantial stand-off capabilities from space and theater assets to effect integrated fires, these operations require a variety of maritime sensors capable of providing over-the-horizon indications and warnings and timely cueing to additional ISR assets or to naval fire support elements.

- The Marine Corps will maintain battlespace awareness over large maritime operating areas with rapid employment of sensors in large numbers through remote delivery via unmanned and manned aircraft and unmanned vessels.
- We are working diligently to expand the sensing range and fidelity of our terrestrial and airborne sensors, which not only include unmanned hydrographic sensors and unmanned vessels, but also include ground-based air defense and coastal surveillance radars.
- Sensors (air, surface, subsurface, and ground) will be interoperable to create a sensor mesh that will be further enhanced with advanced technologies. The stand-in force will be equipped with edge processing across all unmanned systems and sensors to reduce cognitive load and to enable advanced geo-location capabilities, semi-autonomous operations, cross-cueing and tipping, automated target recognition and tracking all linked into our battlespace awareness and kill chain process to distributed decision makers and national/joint targeting agencies.

10. Senator BLUMENTHAL. Lieutenant General Smith, would you agree that the CH53K would play a critical role in the mobility and sustainment of Expeditionary Advanced Bases?

Lieutenant General SMITH. The CH53K would, without question, play a key role in the mobility and sustainment of expeditionary advanced bases. Its range and payload improvements over our current heavy lift helicopter make it an important component of a modernized and fully integrated naval force. It is a modern fly-by-wire helicopter with greater safety, survivability, and reliability compared to other joint rotorcraft. These advantages allow the CH-53K to address the Marine Corps' critical mobility and connector shortfalls from EABO concepts while operating in a contested environment. The CH-53K has the ability to provide more fuel, heavy equipment, critical supplies, and marines at greater distances than any current or emerging rotorcraft. However, the need for improved range and payload in our heavy lift squadrons must be carefully balanced with our need to develop expeditionary long-range precision fires; medium-to long-range air defense systems; short-range air defense systems; and high-endurance, long-range unmanned systems with intelligence, surveillance, and reconnaissance, electronic warfare, lethal strike, and logistics capabilities. We believe this balance is appropriately reflected in the Commandant's decision to reduce the number of heavy lift helicopter (HMH) squadrons from seven to five. Based on current analysis by our aviation subject-matter-experts, five squadrons provide sufficient capacity to satisfy our requirements as well as our future force described in naval concepts.

11. Senator BLUMENTHAL. Lieutenant General Smith, testifying in front of this committee last week General Berger emphasized, “The requirement for a heavy lift helicopter remains valid, in fact probably more valid, considering the adversaries and competitors that we need to face where you want your forward marines.” Do you agree with General Berger that the CH53K is vital to supporting Marine Corps ground warfighting concepts?

Lieutenant General SMITH. As the only heavy lift helicopter in the DOD, the CH-53K contributes to a more lethal joint force and supports both current and future Joint and Naval warfighting concepts by providing agile maritime logistics connectors to the Joint and Naval Force. The CH-53K has a unique ability to rapidly transition from contact layer to blunt layer activities in a maritime high end fight.

12. Senator BLUMENTHAL. Lieutenant General Smith, considering the Marine Corp’s refocus on amphibious operations and support to the fleet, the ability to project ground forces from the sea is more relevant than ever. How will the continued low readiness rate of the legacy CH-53 fleet—and slow procurement of the CH-53K—impact the capacity of our ground forces against a peer adversary?

Lieutenant General SMITH. The CH-53E remains a survivable and relevant heavy lift helicopter in the Marine Corps’ role against a peer adversary and will be flying in support of the operational forces through fiscal year 2030. Continued investment in the sustainment and modernization of the CH-53E will ensure the capacity of Marine Corps Heavy Lift can support operational ground forces against a peer adversary during the Marine Corps’ transition to the CH-53K.

13. Senator BLUMENTHAL. Lieutenant General Smith, in what other ground based warfighting concepts does the CH-53K play a role?

Lieutenant General SMITH. CH-53K addresses current connector shortfalls and is a critical enabler of the execution of Expeditionary Airfield Base Operations (EABO) by enabling distributed operations and more logistical support than any rotorcraft in the DOD. The CH-53K is a modern fly-by-wire helicopter with greater safety, survivability, and reliability compared to other joint rotorcraft.

14. Senator BLUMENTHAL. Lieutenant General Smith, what additional mobility advantages can the CH53K heavy lift capability provide for ground combat units?

Lieutenant General SMITH. CH-53K provides a greater payload (36K Max/ 27K KPP mission profile) than any current or emerging rotorcraft at sea level and high altitude conditions at greater ranges to support the rapid transition of Joint and Coalition forces from contact to blunt layer activities in a contested environment. Specifically, CH-53K is designed to carry a 27,000 pound external load 110 nautical miles in high, hot conditions.

