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THE STATE OF CONVENTIONAL SURFACE SHIPBUILDING

HEARING

BEFORE THE

SUBCOMMITTEE ON SEAPOWER

OF THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

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FIRST SESSION

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MARCH 25, 2025

THE STATE OF CONVENTIONAL SURFACE SHIPBUILDING

TUESDAY, MARCH 25, 2025

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

The Committee met, pursuant to notice, at 2:31 p.m. in room SR–222, Russell Senate Office Building, Senator Rick Scott (Chairman of the Subcommittee) presiding.

Committee Members present: Senators Scott, Sullivan, Sheehy, Kaine, Shaheen, Blumental, and King.

OPENING STATEMENT OF SENATOR RICK SCOTT

Senator SCOTT. The hearing will come to order. Thank you each of you for being here. It's my hour to serve as Chair of this important Subcommittee and I look forward to working with my colleague, Ranking Member Kaine from Virginia, to ensure Navy has the ships and resources they need. The Navy's very significant to both of us.

First off, I want to introduce our witnesses. We're joined by three experts in the State of our Nation's able shipbuilding, starting with Dr. Brett Seidle, who serves as the Acting Assistant Secretary of the Navy for Research Development and Acquisition and is responsible for the overall management for shipbuilding programs. Nice, easy time.

Next, is Vice Admiral James Downey, who serves as the Commander of the Naval Sea Systems Command, providing technical direction, contracting authority, construction oversight, and other critical functions for Navy shipbuilding.

Finally, Shelby Oakley, who is the director for Contracting and National Security Acquisitions at the Government Accounting Office, where she has reviewed our shipbuilding efforts extensively. Thank you again for being here and thank you for what you service to our country.

So many of you have heard me talk about my father, my dad. I'm blessed. I have my doctor dad, he was crazy. He joined the Army very young, underage. He was one of 3,000 Americans who did all four combat jumps for the Second World War. I think he got paid more to do jumps. He thinks about 80 out of 80 people came back alive. He told me the Germans were bad, the foxholes were bad, the food was bad, so I joined the Navy. But I'm proud he did, he did all four combat jumps with the 82d airborne that they did, and then fought in the Battle of the Bulge.

I thought the food was going to be better, but it was really not very great. I served as radarman aboard the USS *Glover*. I'm proud of being a Navy veteran, but we can all acknowledge that he's facing significant challenges and in need of a turnaround. President Trump has made clear that his administration is focused on making our military the lethal fighting force it should be, and I'm glad we have a President focused on this.

In the past few years, unfortunately, we've seen the Navy failing to recruit, pass the audit, and most relevant to our discussion today, deliver ships on time and on budget. In the last 5 years, 41 ships were delivered to the Navy. Of those 41 ships, only four were delivered on time and on budget. It's 9.7 percent. So, I'm a business guy, I built businesses. No one would consider less than 10 percent success, acceptable. In the private sector something would've changed. You wouldn't keep using the same company, a company would probably go bankrupt. You clearly change people out.

Yet, over the past 4 years, we've seen the Navy failing to improve ships, innovate or deliver things on time and on budget. As a failure to the American people expect their Federal Government to use their tax dollars wisely and expect their Navy to be on the cutting edge of innovation to defend our national security.

We clearly have to make some changes. I think my colleague, Senator Kaine, is in the same position. We want to do everything we can to help with a turnaround and we got to do it fast.

In today's Subcommittee on Seapower hearing, we will provide oversight on our Navy's conventional surface shipbuilding efforts, see why our naval readiness and shipbuilding are falling behind communist China, and understand how we can work to rapidly change course.

I have serious concerns about the challenges to our maritime dominance. The United States is losing ground unfortunately to communist China in naval power, and our shipbuilding enterprise is failing to keep up. Communist China Navy has 370 ships and submarines with over 150 major surface combatants, and they continue to pioneer innovative designs like large, unmanned surface vessels and carriers for unmanned aircraft.

In contrast, the United States has failed to capitalize its naval shipbuilding since Ronald Reagan led the production surge over four decades ago. Our service combatant fleet is growing old with the average age of our ship exceeding 20 years, meanwhile, programs intended to modernize our force have completely failed.

The Cruise replacement program, the Littoral combat ship, the *Zumwalt*-class destroyers, its failure to modernized forced us to restart production of older guided missile destroyers (DDG)–51 *Arleigh Burke*-class ships as a temporary fix, even though these ships were already desperately in need of innovation to begin with.

What's even more concerning is that we don't seem to be learning from our mistakes or taking any significant steps to improve the process. Take the *Constellation*-class frigate, once intended as an affordable and mature design, as a glaring example of our ongoing challenges. Our recent Government Accountability Office (GAO) report attributed the program's failures to an immature design, with constant weight growth and slow approval processes that have delayed the lead ship by at least 3 years. This crisis extends beyond

combatant ships. Our logistics and support fleet, including oceanographic ships, towing and salvage ships and fleet oilers, suffer from the same systemic failures.

The common thread here is ships aren't being delivered on time, they're way over budget, and too often they aren't what we wanted. We're past the time for gradual change; we need to take immediate bold transformative action to change how the Navy acquires ships in the entire design and building process. If we don't, we're going to continue falling behind our adversaries, the stakes could not be possibly be higher. Communist China, unfortunately, their government has chosen to be our enemy. It's our job to ensure the United States Navy has the tools and ships it needs to be ready for whatever may come.

Throughout today's hearing, I ask our witnesses to put all options on the table, because if we do not act decisively, the United States risk being a second rate, naval power, unable to defend our interest or deter aggression increasingly in dangerous world. I'd now like to recognize Ranking Member Kaine for his comments.

STATEMENT OF SENATOR TIM KAINE

Senator KAINE. Thank you, Chairman Scott, and thanks to all the witnesses and everybody who's here to talk about this important topic. I look forward to working together as your Ranking Member in this Subcommittee. You're right that both of us personally, you as a Navy Veteran and me as the father of a Marine, but also because of our state's equities, care very deeply about the Seapower mission.

I'll acknowledge the same thing that I acknowledged at the hearing last year, that the hearing takes place during an extraordinary time for the U.S. Navy. Let's start with some positives. Attacks continue on commercial ships in the Red Sea. That's not a positive, but our Nation sailors have demonstrated absolutely remarkable ability to defend key shipping lanes that permit global commerce, battling back against a heavy arsenal of attacks from the Houthis. We appreciate the bravery of the women and men who sail them to those waters and the skill and competence that they've shown over the last many months.

We know that the Navy today is not operating at readiness levels to match the threats we face around the world. We had the hearing in the full Committee 2 weeks back. The Vice Chief basically said that we have an 80 percent readiness standard for ships and subs. It's somewhat complex, what that metric means, but the bottom line is we're at about 62 percent to the 80 on surface ships, 67 percent to the 80 on subs. We've seen some improvement in maintenance, but on the construction side, we're not where we need to be.

Given the change in administrations, the first year of the administration, we never get the budget in February. So, we don't have the budget request for fiscal year 2026. So, I can't yet comment upon how that budget might address the issue of readiness. But we're here today to discuss the State of the industrial base that supports the conventional Navy, how the Navy is supporting the base, and what we need to do to support it in the future.

The Navy's industrial base is not in great shape. I don't say any of that to attack either the Navy, the Navy witnesses, or the indus-

trial base. We have fantastic innovators, but bottom line for a series of reasons, whether it's supply chain challenges, workforce challenges, inflation, not sufficient attention to the way to allocate the work among those with the capacity to do it. We're not meeting our needs.

Despite the best efforts of your predecessors, we have watched as the performance of Navy shipbuilding has degraded across the portfolio. We know that the pacing threat from the Navy is much more stressing than this everyday threat that we're seeing in the Red Sea. The Indo-Pacific and other theaters have critical challenges for us.

There are some success stories: the amphibious warship and destroyer productions are moving forward at pace. But *Virginia*-class submarine, *Columbia*-class submarine, the frigate program that the Chairman mentioned and others, we've got real issues. I am a member of the Health Education Labor Pension Committee, and I'm sort of particularly focused on workforce challenge.

I will just State up front, I'm a little bit worried on the supply chain side and the cost side. What a regime of comprehensive tariffs against products around the world will do this, the cost of some of the inputs that could make this matter even tougher. There are areas where money is going to be needed, but there's also areas where more money is not going to be enough to make the difference, or at least not enough of one fast enough to meet the needs that we have, and so, it's a matter of doing things better.

We have to be open to new approaches, admit what we have been doing needs to change and improve if we want a better outcome. Ms. Oakley, the GAO report that you issued recently, it was long, but my punchline was if we keep doing the same thing we've been doing and expect that the results will magically be better, we're living in a fantasy world. We're not going to get better results unless we're willing to embrace change.

So, I look forward to the discussion today with the Chairman and our colleagues, and with that, I yield back. Great.

Senator SCOTT. Thank you, Senator Kaine. Now we'll hear from Dr. Seidle.

STATEMENT OF DR. BRETT A. SEIDLE, ACTING ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION

Dr. SEIDLE. Thank you Chairman Scott, Ranking Member Kaine and distinguished Members of this Subcommittee, good afternoon. I sincerely appreciate the opportunity to be here today to address the State of conventional U.S. shipbuilding.

I am currently the Acting Assistant Secretary of the Navy for Research Development and Acquisition and prior to assuming this role in January, I spent half my career in the private sector leading manufacturing organizations for General Motors and Alcoa. The other half of my career has been spent leading the Naval Research and Development establishment and since arriving in DC in 2020, I've also spent time serving as the executive director of National Steel and Shipbuilding Company (NASSCO) for leading our Nation's public shipyards.

First and foremost, today, I fervently believe our Navy has never been more important than it is right now. The United States projects its presence around the globe via our Blue Water Navy impacting geopolitical decisions on a daily basis and helping to maintain our way of life.

Leading in the Navy has resulted in a very purpose-driven life for me and I believe it's a mission that resonates with all of us who serve. That mission ensuring the men and women of the armed services come home safely, that our sailors and marines are never in a fair fight, is both motivational and inspirational for myself and the rest of our acquisition team.

I mentioned recently that we have fielded the finest Navy ever assembled in the history of the world, and I believe that is still true yet today. Our Navy's performance these past 3 years has been in a word, outstanding delivering on engagements from the Red Sea to the Western Pacific, and I have been proud to be a part of the team that helps make that possible. For the men and women of this body and the thousands of employees who make up our acquisition enterprise and industrial partners, you have my heartfelt thanks for delivering on that performance.

But today, I have a bounce in my step for another reason, because not only do we have to perform militarily, but we are also in an economic battle with our adversaries. Nations build wealth when they build products. Strong manufacturing base is key to economic buildup.

Today, we once again recognize the need to reinvigorate and awaken the industrial might of our Nation, and I can't think of no better place to start than our shipbuilding enterprise. I truly am more excited about this challenge than anything I've been involved in during the past 40 years and it is way past time that we get after it. I have been asked if it's just too hard to find people that want to do the work of shipbuilding, that the work is too difficult, too hot, too cold, too dirty. I find that assertion to be patently false.

The human condition is the same as when I was a kid. People want a fair wage. They want to be respected for the work that they perform. They want to have a mission they support that's bigger than their life. I think supporting our Navy checks all those boxes.

I have visited our shipyards and it was confirming of my beliefs and rather than being discouraged, I come away emboldened from what I saw. Because there I met industrial partners and leaders I respect, employees who were passionate about our Navy and their role in supporting this country and I also saw latent capacity that can be tapped to make a real difference.

Having said all the above, we clearly have significant challenges in our shipbuilding enterprise. Simply put, we need more ships delivered on time and on budget, and we are challenged in both of these arenas. Costs are rising faster than inflation, and schedules on multiple programs are delayed one to 3 years late. We need increased modernization, infrastructure investment, better workforce hiring and retention, and improved supply chain performance. My commitment to this body is that our industrial partners and I, with your strong continued support, plan to get after these issues and will behave as if the fight is tonight.

I also believe the relationship between this body and our industrial partners is central to our success and solving the problems already mentioned. In each of these three groups, individuals get up every day, passionate about solving the problems in front of us with similar goals and aspirations, albeit different perspectives.

In that vein, this Committee has my passionate commitment to be an outstanding partner, to look forward and drive change, to build the connective tissue with our industrial partners-instrumental to our success, and to reinvigorate our manufacturing base to drive the economic engine of this country.

I am genuinely excited to be here today and look forward to taking your questions.

Senator SCOTT. Thank you. Vice Admiral Downey.

STATEMENT OF VICE ADMIRAL JAMES P. DOWNEY, USN COMMANDER, NAVAL SEA SYSTEMS COMMAND DEPARTMENT OF THE NAVY

Admiral DOWNEY. Chairman Scott, Ranking Member Kaine, distinguished members of the Seapower Subcommittee. Thank you for this opportunity to appear before you today to discuss the Navy's conventional surface shipbuilding programs.

I would first like to thank the Committee for its candid perspectives, in determination to help the Navy accelerate the delivery of combat power to the fleet. Recent testimony before Congress, including testimony reports from my GAO colleague, Ms. Oakley, have been integral in supporting the Navy's routine communication with Congress regarding the complex realities of shipbuilding in 2025.

As the commander of Naval Sea Systems Command (NAVSEA), I am privileged to lead a team charged with translating war fighter requirements into combat capability, enabling our Nation and its allies to provide persistent presence and peace, project power and war, and assured access at all times. Our focus is on getting our ships and their war fighting systems designed, delivered, and maintained to meet global national security requirements.

With any project and certainly one as complex as shipbuilding, judicious planning is what establishes the foundation for successful execution. As the technical authority for our ships and related systems, NAVSEA is committed to appropriately evaluating costs schedule, and technical requirements to deliver the right capabilities to our war fighters, recognizing that requirements discipline plays a quintessential role in shaping a program for success.

As a best practice, the Navy procures approximately 50 percent of our surface force to primarily commercial standards. For combatant programs, with more stringent build requirements, we continually review our military specifications and are committed to doing so collaboratively alongside industry, to simplify and streamline wherever possible.

We are also actively transitioning design plans into digitized formats, reducing the burden on the ship builder. Similarly, we are committed to working alongside industry, to ensure our contracts and acquisition strategies are aligned and balanced to the specific procurement need. We continue to face mounting challenges, from shifting demographics and workforce shortages, to supply chain

disruptions, that collectively continue to pressurize our shipbuilding contracts.

We need strategic solutions to improve waterfront productivity, and we are evaluating contracting approaches and incentives, while also centralizing that data to better access what levers are needed to improve shipbuilding performance. In program execution, our supervisors of shipbuilding provide the onsite technical and contractual oversight for the construction of Navy vessels at our major private shipyards.

As of today, the Navy has 92 ships under contract, with 56 ships actively in construction. In addition to these prime shipbuilding contracts, we also have a number of yards that outsource large components, resulting in a more distributed shipbuilding model, with somewhat more complex oversight required.

With the assistance of this Committee, we now have a dedicated Deputy Commander within NAVSEA, overseeing our waterfronts and improving communications and coordination across all of our shipbuilding projects, to better deliver capability at the speed and scale of need.

When you visit the shipyards and speak to the workers, whether it's welders, machinists, front office staff, or engineers, you understand what it means to them to build a great ship from the keel up, to start with nothing and then to deliver a fully capable warship. That's the product of teamwork in its purest form of execution.

This shipbuilding culture, which in some communities goes back generations, is what we focus on cultivating and nurturing. Continuing to do so will require competitive wages as well as affordable housing, quality schools, and other supporting functions for the shipyard workers. NAVSEA is deeply committed to helping industry create productive, and safe workspaces on the waterfront in order to attract and retain the skilled workforce we need to build the Navy our Nation requires.

So, I thank Congress for these investments in our shipbuilding programs, because these efforts will not only help stabilize production, but will enhance the maritime industry for future generations. I'm committed to transparently working in close collaboration with this Congress and industry to meet the Navy's four structure goals.

Thank you again for this opportunity to appear before you today. I look forward to your questions.

[The joint prepared statement of Dr. Brett A. Seidle and Vice Admiral James P. Downey follows:]

[The information referred to follows:]

JOINT PREPARED STATEMENT BY DR. BRETT A. SEIDLE AND VICE ADMIRAL JAMES P. DOWNEY

INTRODUCTIONS AND WELCOME

Chairman Scott, Ranking Member Kaine, and distinguished Members of the Subcommittee, thank you for the opportunity to appear before you today to address the status of conventionally powered surface shipbuilding. Building and maintaining a world-class and globally deployable Navy and Marine Corps as a first line of defense for the United States is a continuous effort. We can only achieve our strategic goals of strengthening maritime dominance, executing a culture of warfighting excellence, and remaining the most lethal force in the world by building and maintaining resilient supply chains, engaging in flexible acquisition practices as current authorities

allow, employing sound economic deterrence principles, and training and retaining a robust and knowledgeable workforce.

The presence of the Navy and Marine Corps team reassures international allies and partners, deters potential adversaries and responds to those who threaten the lives of our Sailors, Marines and civilian merchant mariners engaged in lawful operations and international commercial activities. A strong, resilient, and effective shipbuilding industrial base, composed of shipyards, depots, original equipment manufacturers (OEMs), suppliers, ship designers, and associated supply chains, is essential to accomplishing and sustaining operational readiness. Growing and modernizing vital production and repair facilities is a national security imperative. We, alongside our industry partners, must invest in our industrial base with a collective goal to accelerate the production, throughput, and sustainment of the ships and submarines we require. We, alongside our industry partners, must continue to hold ourselves accountable and we will.

The security of our country and preservation of our national interests remains reliant on a superior naval force, strategically postured to deter conflict and, if necessary, fight and win America's wars. Global events have continued to pressurize the need for rapid change and the Department of the Navy (DON) has taken note. We are aggressively seeking and implementing new and improved ways to operate, integrate, and sustain our forces and maintain a solid industrial base. The Navy and Marine Corps team must continue to provide unmatched operational capability to best support the geographic Combatant Commanders in countering constantly evolving geopolitical challenges and threats.

Ensuring timely delivery of ships that are capable and on-budget is critical to maintaining our national security and maritime dominance. The DON appreciates the support of Congress and this Committee for the Department's acquisition, sustainment, research, and development programs that allow us to continue to build and operate a lethal, capable, integrated, and forward-postured Navy and Marine Corps.

STATE OF CONVENTIONAL SURFACE SHIPBUILDING

U.S. shipbuilders continue to produce the highest quality, safest, and most advanced warships on the globe. At a time when outstanding performance against adversaries is needed in contested maritime commons from the Red Sea to the Western Pacific, the U.S. Navy continues to provide unmatched capability. However, the U.S. shipbuilding industry is challenged to produce the quantity of ships at the rate required to effect lasting, sustainable growth in the battle force inventory and the Navy is challenged in providing reliable direction as the underpinning for their success. On balance, cost and schedule performance remain challenged; deliveries are approximately one to 3 years late and costs continue to rise faster than overall inflation. These challenges are prevalent across the nuclear and conventional shipbuilding communities with both Navy and Industry sharing responsibility. Identified challenges include atrophy of our manufacturing industrial base, pre-COVID contracts, workforce shortages related to macroeconomic and demographic trends, diminished workforce proficiency, supply chain disruptions, iterative technical requirement updates, design immaturity, and inconsistent industry investment across the shipbuilding industrial base.

Similar pressures affect the Tier 2 and 3 shipyards, providing opportunity for the Navy to more consistently level load workload where additional capacity remains. The Navy must continue to provide reliable demand signal to the industrial base to broaden interest, strengthen commitment, and encourage investment at all levels.

The U.S. share of global shipbuilding—commercial and military—and the number of naval vessels delivered per year are not meeting the desired targets. The current industrial base is optimized for the efficient, peacetime production of ships and munitions. Historic underinvestment and industry consolidation following the end of the cold war have reduced competition and capacity at the Tier 1 shipyards and their suppliers, leading to workforce-constrained build schedules that do not meet Navy targets. The remaining prime shipbuilders and subcontractors face shortages of available skilled workers in both the trades (welders, pipefitters, electricians, etc.) and design/engineering workforce leading to schedule disruptions, delayed delivery of critical components, and associated cost and schedule challenges.

In addition, the current relative wage rate for shipbuilders is behind historical averages. In the 1980's, approximately 38 percent of the workforce was engaged in manufacturing activity. Today, that number is closer to 12 percent. It is also true that, historically, manufacturing sector workers earned approximately 3–4 times the minimum wage, irrespective of geography. Today, shipyard workers' wages are only marginally above inflation-adjusted living wages, which leads to significant competi-

tion with local service sectors and adjacent labor pools. The Navy encourages the shipyards to make continued and increased investment in their workforce, alongside efforts to improve quality of service for their shipbuilders, which is critical to increasing hiring, reducing attrition, and developing the workforce. The Navy has recently funded initiatives aimed at improving transportation and parking options, addressing housing and childcare shortages, and providing retention bonuses to address these challenges at some of our major prime shipbuilders. The Navy acknowledges that additional opportunities remain and is working with the Administration to identify and support them.

The Navy faces its own challenges as well. Burdensome acquisition processes and contracts that were established prior to the COVID–19 pandemic also contribute to the current situation. We are committed to improving our acquisition, oversight, and cost estimation and budgeting processes, holding ourselves accountable, implementing innovative contracting strategies, and continuing to develop the acquisition workforce.

PATH FORWARD

With the help of Congress, the U.S. Navy is a key participant in a whole-of-government effort to enhance the national shipbuilding industry. In addition to investments in the nuclear shipbuilding industrial base and surface combatant industrial base, the Navy is in the middle of a generational increase in demand for shipbuilding.

With 92 ships on contract and 56 hulls under construction, the Navy assesses industry has sufficient backlog to continue materiel investments and labor force hiring, retention, and improvement initiatives. The Navy is assisting with capital expenditure projects at each of the Tier 1 shipyards, workforce development initiatives, and investing in growing the labor pool for critical trades. The Navy is also pursuing strategic outsourcing efforts to smartly shift some workload to smaller shipyards and key suppliers to enable long-term sustainable growth in capacity at the prime shipbuilders delivering our battle force ships, including the innovative partnership with private equity and industry to create the United Submarine Alliance Fund and the subsequent purchase of the Alabama Shipyard.

The Navy is working to improve the cost realism between cost estimates, budgeting, and contracting for shipbuilding programs. Cost estimates must continue to adapt to the changing workforce and supply chain.

In September 2024, the Navy established the Maritime Industrial Base (MIB) Program Office to lead enterprise efforts to restore America's shipbuilding capacity and to ensure the Navy can build and sustain the fleet required to support the National Defense Strategy. This strategic reorganization integrates the Submarine Industrial Base and Surface Combatant Industrial Base programs into a cohesive entity focused on the overall health of the maritime enterprise. The transition to the MIB Program represents a comprehensive approach to revitalizing America's shipbuilding and ship sustainment ecosystems, enabling the Navy to holistically address challenges and opportunities, respond to a comprehensive Navy demand signal, while also opening the aperture on efforts and investments to meet future defense demands more efficiently.

The U.S. maritime industrial base is the critical enabler of the Navy's ability to deliver and maintain combat capability necessary to execute its missions around the world. The industrial base consists of public and private naval shipyards, private industry partners, highly skilled workforces, OEMs, complex supply chains, and organic resources. Since 2018, approximately $9 billion has been appropriated for submarine industrial base efforts. Congress has also appropriated $1.2 billion for the large surface combatant and frigate industrial base. The Navy's strategy to improve the health of our maritime industrial base is focused on six key lines of effort: growing capability and capacity in the supply chain, modernizing shipbuilder infrastructure, expanding capacity of key suppliers to take on work traditionally executed by shipbuilders, developing the critical maritime manufacturing workforce, operationalizing advanced manufacturing technology, and increasing government oversight.

The Navy has implemented a data-driven and data-informed process to ensure our investments and initiatives are targeting the primary needle-movers and enablers of shipbuilding and ship sustainment schedules. As part of this process, we assess and track impacts of Navy investment at multiple levels. At the individual project level, the Navy implements discrete, measurable return on investment metrics for each project with a mandated feedback loop to measure progress. At the aggregate level, we assess multiple individual projects with shared objectives; and at the portfolio level, we assess projects and aggregate-level impacts relative to production

schedule drivers. The Navy's data-based assessment and decisionmaking process for industrial base investment enables a standard approach to assessing impact and identifying challenges and opportunities, improving coordination, and integrating perspectives among a range of stakeholders. Collectively, these efforts support flexible decisionmaking to meet a dynamic supply chain environment.

The Navy is seeing early indications that investments appropriated to date are helping to stabilize targeted sectors of the industrial base that provide critical materials for in-service ships as well as new construction programs. Since Fiscal Year 2018 (FY 2018), we have launched more than 725 supplier development projects with more than 300 suppliers across 33 states to add capability, capacity, and resiliency to the supply chain, including developing alternate suppliers for critical components. The Navy has invested more than $1 billion since fiscal year 2018 to improve the performance of companies that supply sequence-critical material for new construction programs—material that must be delivered on time to maintain production schedules. The Navy's six regional Talent Pipeline Programs have placed more than 6,400 trades workers in the maritime sector and, through our partnership with the Southeastern New England Defense Industry Alliance, more than 6,750 workers have been trained and placed in the shipbuilding industrial base.

The Accelerated Training in Defense Manufacturing rapid trades training program in Danville, VA has trained more than 775 students in key maritime trades, and in January 2025, opened the National Training Center which will scale the program to 1,000 graduates per year by 2025. The Additive Manufacturing Center of Excellence (AM CoE) in Danville, VA made significant progress in maturing and operationalizing additive manufacturing, printing more than 270 parts and leading efforts to scale AM by producing production-ready Technical Data Packages, responding to emergent material needs, centralizing non-recurring engineering, and qualifying AM suppliers to enable parts production at scale. The AM CoE is already helping get our ships back to sea, with more than 15 examples where the AM CoE has printed parts for ships and submarines in response to emergent needs, saving over 900 days of delay relative to traditional procurement paths.

RECENT ACCOMPLISHMENTS

Flight III DDG 51s will provide enhanced Integrated Air and Missile Defense (IAMD) with the AN/SPY–6(V)1 (SPY–6) radar and Aegis Baseline 10 (BL10) combat system. These combat system enhancements meet the growing ballistic missile threat by improving radar sensitivity and enabling longer range detection of more numerous and increasingly complex threats. The Flight III program demonstrated design maturity through its successful completion of phase 1 developmental testing and the SPY–6 radar program is in serial production to support delivery for Flight III and DDG Modernization 2.0 ships. August 2024 marked the successful completion of initial shipboard Developmental Testing on the first DDG 51 Flight III ship, USS *Jack H Lucas* (DDG 125), which delivered in June 2023.

The Navy is extending a number of *Arleigh Burke*-class (DDG 51) Destroyers beyond their 35-year Expected Service Life, which will provide additional years of ship service life through the mid–2030's. Over the last 15 years the Navy has made significant investments in DDG 51 Class Maintenance and Modernization, allowing them to continue providing credible capacity to the Fleet thanks to combat system upgrades and compliance with lifecycle maintenance plans.

The *Zumwalt*-class (DDG 1000) guided missile destroyers are multi-mission surface combatants designed to provide long-range, offensive surface strike capabilities. The DON is developing a hypersonic weapon system that will enable precise and timely strike capability against deep inland targets in contested environments. In collaboration with the Army, the Department is leveraging a common All Up Round missile design and test opportunities to field a conventional hypersonic weapon system. *Zumwalt*-class DDGs will be the first Navy platform to field hypersonic capability in the late–2020's, followed by Block V *Virginia*-class SSNs starting in the early 2030's. The development and demonstration of hypersonic strike weapon systems supports the U.S. ability to deter, and if necessary, defeat potential adversaries.

The DDG 1000 program continues to accomplish first-time integration of unique combat systems elements, complete Post Delivery Test and Trials, demonstrate operational performance and start the installation of the first Conventional Prompt Strike (CPS) hypersonic weapon system on a maritime platform.

The *Constellation*-class Frigate (FFG 62) is an essential program in pursuit of a larger and more lethal Joint Force in response to the urgent China threat. The FFG 62 acquisition strategy is informed by previous shipbuilding programs and takes advantage of proven systems that increase commonality across platforms and de-

creases developmental risk, including the three-phased-array SPY–6(V)3 radar, Vertical Launch System (VLS) missile launchers, and Aegis combat system software. The first six ships are under contract with the future-USS *Constellation* under construction. The Navy acknowledges significant schedule delays for the lead ship due to a number of factors. The Navy and shipbuilder continue to surge resources in this area to complete design reviews and ensure achievement of required capability.

After overcoming significant challenges in design and production, the LCS Class continues to mature, and the Navy continues to invest in making the ships more lethal and survivable to elevate their value in the future fight. The Navy will continue to invest in systems like the Naval Strike Missile (NSM) and Lethality and Survivability (L&S) upgrades. L&S upgrades address system obsolescence, enhance cyber security protection to LCS computing environments, provide weapons system performance enhancements, and add survivability systems.

The Navy reached a significant milestone in modernizing mine countermeasure (MCM) capability, as the MCM Mission Package (MP) declared IOC in March 2023. The Navy has since embarked three LCS MCM MPs onto Independence Variant LCSs, starting in April 2024. The MCM MP is slated to begin deployments in fiscal year 2025, and MCM MPs remain on track to fully replace the aging *Avenger*-class MCM and MH–53E Airborne MCM (AMCM) fleet by the end of fiscal year 2027.

Our Navy and Marine Corps integrate resources across disparate domains and elements of national power to deter adversaries and campaign forward. Procuring our amphibious ships affordably and efficiently is essential. On September 24, 2024, the Navy awarded an amphibious Multi-Ship Procurement (MSP) contract for three *San Antonio*-class (LPD 17) and one *America*-class (LHA). The amphibious ship MSP demonstrates the Navy's commitment to maintaining 31 amphibious warfare ships and prudence with taxpayer funds. This multi-billion-dollar award reflects Navy's commitment to build and sustain our maritime dominance and allows for critical investment and sustainment of our shipbuilding industrial base, helping to ensure stability and jobs for the next decade.

In addition to large, manned battle force ships, the Navy continues to identify and pursue opportunities for manned-unmanned teaming to increase overall lethality of the joint force. The DON continues to invest and mature the enabling and core technologies needed to deliver unmanned surface and undersea capabilities. These capabilities along with the platforms to support them are foundational to creating the hybrid fleet of the future. Manned-unmanned teaming will increase capacity, standoff, reach, and enable maneuver and Distributed Maritime Operations while reducing risk to our sailors and marines. Unmanned Surface Vehicles (USV) will expand information operations and missile magazine depth. The Navy continues to work with our industry partners on maturing reliable Hull, Mechanical and Electrical capability; advancing the required networks and radios; developing a common core USV Combat System and vessel control software; improving sensory perception and autonomy; and prototyping platform and USV payloads. In fiscal year 2024, the Navy successfully completed six 720-hour propulsion configuration tests in accordance with the 2021 NDAA language. These successful tests will allow certification of multiple propulsion configurations for use on future USVs. Our fleet of five USV prototypes provide valuable fleet training opportunities as we continue to develop Tactics, Techniques, and Procedures. These prototypes are helping us to mature technology in support of future USV procurement.

CONCLUSION

Maintaining and enhancing the conventional surface shipbuilding industry is critical to sustaining the operational readiness and strategic posture of the Navy and Marine Corps. The challenges faced by the shipbuilding industry require a collective and sustained effort from the Department of the Navy and our industry partners to continue holding ourselves accountable to the warfighter and the taxpayer. By investing in the industrial base, modernizing facilities, developing a skilled workforce, and holding ourselves accountable we can ensure that the Navy and Marine Corps team remains capable and prepared to meet evolving geopolitical challenges and threats. The Department of the Navy is committed to improving acquisition processes, employing innovative contracting strategies, and continuing to support the shipbuilding industry to accelerate production and maintain a resilient supply chain.

The Navy is a key participant in the whole-of-government effort to enhance the national shipbuilding industry. Combined with generational investments in the maritime industrial base, we are collaborating with Congress, industry, academia and training organizations, trade associations, and all levels of government in pursuit

of improved cost and schedule performance. Together, we can build and sustain a lethal, capable, and forward-postured Navy and Marine Corps that will continue to safeguard our national security and maritime dominance. Our Nation and the world need the strength of our Navy, and our intent is to do everything in our power to deliver on that promise.

Senator SCOTT. Thanks, Admiral. Ms. Oakley.

STATEMENT OF MS. SHELBY S. OAKLEY, DIRECTOR, CONTRACTING AND NATIONAL SECURITY ACQUISITIONS GOVERNMENT ACCOUNTABILITY OFFICE

Ms. OAKLEY. Chairman Scott, Ranking Member Kaine and Members of the Subcommittee, thank you for the opportunity to speak with you today about the ongoing challenges facing Navy surface shipbuilding and the solutions that could help turn things around.

Let's start with the hard truth. Despite the Navy shipbuilding budget nearly doubling over the past two decades, the size of its fleet hasn't grown. The Navy had roughly the same number of ships in 2003 as it does today, even though it has spent billions trying to expand. In addition, almost every surface ship is now significantly delayed.

Meanwhile, our strategic competitors are rapidly building and deploying modern, highly capable fleets. The Navy simply cannot afford to continue with business as usual.

For over 20 years, GAO has been reporting that the Navy's approach to shipbuilding is fundamentally flawed. We've issued 90 recommendations since 2015 alone, yet more than 60 of them remain unaddressed and the consequences of inaction are clear, billions in cost overruns, years of schedule delays, ships that ultimately don't provide expected capability.

The biggest driver of the outcomes we see are the unrealistic business cases that the Navy puts forward to support its shipbuilding programs. These business cases don't adequately reconcile what can actually be done within available resources, including technology, design knowledge, industrial based capacity, and funding.

As a result, the Navy's budget requests are founded on optimism, to secure funding. Later as business cases deteriorate and realism sets in, challenges that were predictable from the start, begin to emerge. Yet the Navy continues to push forward, awarding contracts for ships that likely can't be built with the resources available. As a result, they arrive later than planned and cost far more than expected. The Littoral Combat Ships (LCS) and DDG 1000, among others stand out as prominent prior examples of this dynamic.

The question is, has the Navy learned from these past mistakes? To some extent, yes. Recent efforts incorporating more proven systems and increasing engagement with industry before contract award are steps in the right direction. But old habits die hard.

Take the Frigate program for example. The Navy has already put six ships under contract despite the fact that two key systems remain unproven and design changes have led to weight growth that threatens performance. Now over 2 years in, construction on the lead ship has effectively stalled with delivery delayed by at least 3 years. This isn't just a minor hiccup, it's indicative of a system where providing a capable ship to the fleet on time is given less

priority than protecting the program budget and keeping money flowing to underperforming programs, under the guise of stabilizing the industrial base. This approach directly threatens the Navy's ability to meet its long-term force structure goals that rely on large numbers of frigates.

You might ask, is this scenario simply unavoidable? Is Navy shipbuilding just irreparably broken? The answer's no, but the Navy must break the cycle. Our work over the past 15 years, visiting and learning from leading companies around the world, including leading builders and buyers, consistently demonstrates that large complex projects can be designed and built on schedule and within budget, if the right practices are followed.

These include things like first developing a solid business case, one that aligns technology design knowledge funding, industrial based capacity, and time, before committing to construction. Then continuously evaluating that that business case is maintained.

Second, adopting iterative approaches that include developing and refining designs and cycles, using knowledge gained from testing, validating, and obtaining user feedback. Third, improving collaboration by streamlining decisionmaking. Finally strengthening in-house expertise and investing in modern ship design capabilities and digital tools to better execute and oversee programs.

These approaches enable leading ship builders to develop complex ships in vastly shorter timeframes in the Navy, and to be adaptable to evolving customer needs. Our work has shown that they can be thoughtfully applied to Navy shipbuilding.

In conclusion, the Navy has much work to do to improve its practices and restore its credibility with Congress, taxpayers in the fleet. It won't be easy. Breaking with entrenched ways of doing business requires sustained commitment over many years to see real change. Such improvements could help the Navy achieve its four structure goals faster, create stability for the industrial base, and send a clear message to potential adversaries that the U.S. Navy remains the dominant maritime force.

Chairman Scott, Ranking Member Kaine, and Members of the Subcommittee, thank you for your time and for allowing me to speak on this important topic. I'll take any questions you have.

[The prepared statement of Ms. Oakley follows:]

United States Government Accountability Office

Testimony

Before the Subcommittee on Seapower, Committee on Armed Services, U.S. Senate

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NAVY SHIPBUILDING

Enduring Challenges Call for Systemic Change

Statement of Shelby S. Oakley, Director, Contracting and National Security Acquisitions

GAO-25-108225

GAO

Highlights

Highlights of GAO-25-108225, a testimony before the Subcommittee on Seapower, Committee on Armed Services, U.S. Senate

March 25, 2025

NAVY SHIPBUILDING

Enduring Challenges Call for Systemic Change

Why GAO Did This Study

Although the Navy has seen a near doubling of its shipbuilding budget over the past 2 decades, acquisition challenges have resulted in consistent failure to increase its ship count as planned. GAO has regularly reported that the Navy's shipbuilding acquisition approach does not align with innovative practices that promote timely, predictable development and delivery of new, fully capable ships.

This statement addresses (1) challenges that Navy practices pose to achieving desired shipbuilding outcomes, and (2) leading commercial practices that could improve Navy results over both the near term and far term.

This statement is based on information from GAO-25-108136, GAO-24-106546, GAO-24-105503, and GAO-23-106222, among others. Information about the scope and methodology of prior work on which this statement is based can be found in those products.

What GAO Recommends

GAO has made 90 recommendations to the Navy since 2015 to improve its shipbuilding acquisition practices and outcomes. The Navy agreed with many of them. However, the Navy has only fully or partially addressed 30; 60 remain unaddressed. GAO's leading practices, observations on the industrial base, and open recommendations provide a starting point for the Navy to develop a holistic approach to improve its shipbuilding outcomes.

For more information, contact Shelby S. Oakley at oakleys@gao.gov.

What GAO Found

Although maritime threats have been growing, the Navy has not increased its fleet size as planned over the past 20 years. Over this period, GAO has found that the Navy's shipbuilding acquisition practices consistently resulted in cost growth, delivery delays, and ships that do not perform as expected. For example, GAO identified schedule risks in 2024 for the *Constellation* class frigate program. Counter to leading ship design practices, construction for the lead ship started before the ship design work was complete, and delivery is expected to be delayed by at least 3 years.

The Navy's recent practices with the frigate program are similar to its prior performance with its Littoral Combat Ship and *Zumwalt* Class Destroyer programs. Both programs were hampered by weak business cases that over-promised the capability that the Navy could deliver. Together, these two ship classes consumed tens of billions of dollars more to acquire than initially budgeted and ultimately delivered far less capability and capacity to fleet users than the Navy had promised. The Navy cannot expect to look within its existing playbook to find answers. Current challenges can provide the Navy leadership with the impetus to look for solutions outside of the existing defense acquisition paradigm. Specifically, the Navy can innovate by using effective, proven ship design practices and product development approaches that are rooted in the approaches of industry-leading companies worldwide.

GAO has previously identified leading ship design practices used by commercial ship buyers and builders that the Navy can use to achieve more timely, predictable outcomes for its shipbuilding programs.

Leading Practices Supporting Timely Ship Design and Delivery

Establish business cases and requirements that support predictable design outcomes	Use iterative design to accelerate ship design maturity	Use efficient ship design collaboration and decision-making practices	Employ robust in-house ship design capabilities and tools

Source: GAO analysis of commercial company information; GAO (icons). | GAO-25-108225

While the Navy strives to improve its shipbuilding performance, marginal changes within the existing acquisition structures are unlikely to provide the foundational shift needed to break the pervasive cycle of delivery delays and cost overruns. Leading practices offer the Navy a near-term path toward restoring credibility with the operational fleet, Congress, and the taxpayers. More importantly, over the long-term, these leading practices can help the Navy redefine its shipbuilding acquisition process, achieve its goals related to the number of ships needed to compete against potential adversaries, and reinforce the superiority of the Navy fleet.

Chairman Scott, Ranking Member Kaine, and Members of the Subcommittee:

Thank you for the opportunity to discuss the U.S. Navy's acquisition challenges with its surface ship programs. Today's Navy is imperiled by cost growth and schedule delays within its shipbuilding portfolio. As we recently reported, the Navy has no more ships today than when it released its first 30-year shipbuilding plan in 2003.[1] This stagnation has occurred despite regular demands and plans for a substantial increase to the Navy's fleet size and a near doubling of its shipbuilding budget (inflation adjusted) over the past 2 decades. In a time of strategic competition, with near peer adversaries rapidly fielding technically advanced, disruptive technologies and expanding their fleets, the Navy's current acquisition outcomes demand that it retools how to acquire new capabilities. The Navy's findings from its 45-day shipbuilding review last year echoed problems we have reported on for years about acquisition strategy and design issues contributing to unrealistic ship delivery schedules. These issues underscore the need for acquisition change, including closer scrutiny of business cases for the Navy's surface ship programs.

The Navy historically sets extensive and detailed requirements for new vessels many years before these vessels are fielded. It locks in major commitments to construct ships before design stability is achieved. These actions have led to unrealistic cost and schedule expectations. In turn, these unmet expectations disturb the Navy's funding plans, driving the department to redirect resources intended to pay for other needs and resulting in unfunded capabilities. In this environment, Navy programs and their shipbuilders are effectively made to operate in a perpetual state of triage. As a result, the Navy must divert its attention to shipbuilding programs that fall behind schedule and grow in cost. For decades, the Navy has written off this anticipated chaos as mere "first of class" challenges that affect lead ships. However, our analysis of the Navy's recent shipbuilding performance shows that lead ship challenges regularly cascade to follow-on ships, causing entire programs to run aground. Further, delays in delivering new ships to the fleet exacerbate the risks of obsolescence and capabilities becoming irrelevant when

[1]GAO, *Shipbuilding and Repair: Navy Needs a Strategic Approach for Private Sector Industrial Base Investments*, GAO-25-106286 (Washington, D.C.: Feb. 27, 2025).

threats evolve. These challenges hinder the Navy's ability to meet operational and national security needs.

To its credit, the Navy has taken action over the past decade aimed at addressing some of the problems that have beset key shipbuilding programs. These actions include efforts to reduce technical risk by incorporating proven systems into new ship designs as well as increased engagement with industry and fleet users about requirements and design prior to construction. The Navy and the Department of Defense have also dedicated funding—$775 million—intended to bolster the surface ship shipbuilding industrial base.[2] During this same period, we have made 90 recommendations to the Navy focused on improving the practices and results of its shipbuilding programs.[3] The Navy largely agreed with our recommendations and has taken action to fully address 23 and partially address 7 of them. However, we currently have 52 open recommendations that the Navy has yet to address, and 8 more that we closed without the Navy taking action because the recommended actions were overcome by events. Navy action to implement our recommendations would contribute to improvements for its shipbuilding results and lead the Navy to reexamine and change its approach to shipbuilding.

My statement today will address: (1) challenges that Navy practices pose to achieving desired surface ship shipbuilding outcomes, and (2) leading commercial practices that could improve Navy shipbuilding results over the near term and far term. This testimony largely leverages a testimony statement we recently delivered before the Subcommittee on Seapower and Projection Forces, Committee on Armed Services, House of Representatives.[4] Further, this testimony includes findings and analyses from our recent reports related to Navy shipbuilding and weapon system acquisitions, more generally; capstone work on past Navy shipbuilding performance and lessons learned; and foundational reports on leading practices in shipbuilding, ship design, and product development. This

[2]This funding reflects Navy direct investments made to the surface combatant and frigate industrial base and does not reflect contract incentives for private investment paid between fiscal years 2014–2028.

[3]This total only includes recommendations from our publicly available reports.

[4]GAO. *Navy Shipbuilding: A Generational Imperative for System Change*, GAO-25-108136 (Washington, D.C.: Mar. 11, 2025).

statement highlights acquisition challenges from four Navy shipbuilding programs.

For the reports cited in this statement, we analyzed Navy guidance, data, and documentation; performed site visits to shipyards; and interviewed officials from the Navy, other Department of Defense organizations, and shipbuilding companies, among other methodologies. These activities supported our efforts to determine the extent to which Navy shipbuilding programs are meeting their cost, schedule, and performance goals and delivering vessels with needed capability to the fleet. The reports directly cited in this statement, which we published from June 2018 through February 2025, provide further detailed information on their objectives, scope, and methodology.[5] For statements related to the Navy's *Zumwalt* Class Destroyer (DDG 1000) and Medium Landing Ship (LSM), we summarized Navy reviewed information as part of our upcoming Weapon Systems Annual Assessment. We conducted the work on which this statement is based in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

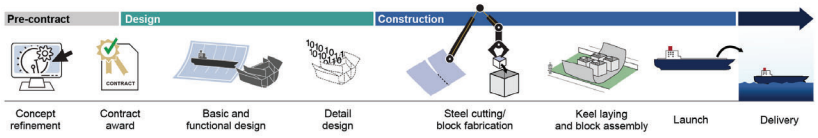
[5]GAO-25-106286; *Weapon Systems Annual Assessment: DOD Is Not Yet Well-Positioned to Field Systems with Speed,* GAO-24-106831 (Washington, D.C.: June 17, 2024); *Navy Frigate: Unstable Design Has Stalled Construction and Compromised Delivery Schedules*, GAO-24-106546 (Washington, D.C.: May 29, 2024); *Navy Shipbuilding: Increased Use of Leading Design Practices Could Improve Timeliness of Deliveries*, GAO-24-105503 (Washington, D.C.: May 2, 2024); *Leading Practices: Iterative Cycles Enable Rapid Delivery of Complex, Innovative Products,* GAO-23-106222 (Washington, D.C.: July 27, 2023); *Leading Practices: Agency Acquisition Policies Could Better Implement Key Product Development Principles,* GAO-22-104513 (Washington, D.C.: Mar. 10, 2022); and *Navy Shipbuilding: Past Performance Provides Valuable Lessons for Future Investments*, GAO-18-238SP (Washington, D.C.: June 6, 2018).

Background

Shipbuilding Process

Shipbuilding is a complex, multistage industrial activity that includes common key events regardless of the type of ship construction or nature of the buyer (government or commercial). As shown in figure 1, key events are sequenced among three primary stages that move from concept through design and construction to deliver a new ship.

Figure 1: Notional Ship Design and Construction Process



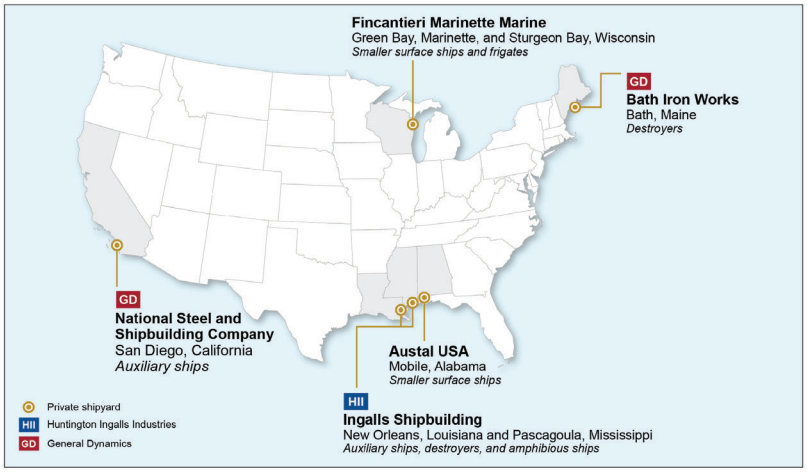
Source: GAO analysis of shipbuilding information; GAO (illustration). | GAO-25-108225

Note: This figure depicts a generic shipbuilding process. Navy shipbuilding programs and commercial companies may use different terms to describe their design phases within the overall process. Further details on the basic process used for commercial or government ship design and construction can be found in GAO-24-105503.

Navy Industrial Base for Surface Ships

At the prime contractor level, the Navy primarily uses five private shipyards for its surface ship shipbuilding programs. Given workforce and capacity limitations, improving the industrial base has been a priority across the Navy. Figure 2 shows the locations of the major private shipyards that the Navy contracts with for surface ship shipbuilding.

Figure 2: Locations of Major Shipyards That Build Non-nuclear Navy Surface Ships



Source: GAO analysis of private shipbuilder information; Map Resources (map). | GAO-25-108225

These shipyards use a network of suppliers, known as the supplier base, to provide a range of items, from raw materials to manufactured items.

Weak Business Cases Allow Navy Programs to Start Fast and Affordably but Cause Them to Finish Slow and at a Higher Cost

Persistent challenges in meeting shipbuilding cost, schedule, and performance goals have resulted in less-capable ships, limited fleet growth, and diminished the Navy's credibility as a steward of taxpayer dollars. Our June 2018 report on Navy shipbuilding performance over the prior 10 years expounded on these persistent problems. We found that Navy ships cost billions more and take years longer to build than planned while often falling short of quality and performance expectations.[6] Most recently, in February 2025, we summarized the Navy's shipbuilding cost and schedule challenges—including that most surface ship programs under construction are projected to be delivered late—and the effect that they have had on the Navy's ability to meet its goals, including to increase the size of the fleet.[7] These problems often stem from a weak business case that leads to poor acquisition decisions. Two programs, the Littoral Combat Ship (LCS) and the DDG 1000 exemplify what can go wrong when a sound business case is lacking. Unfortunately, two newer programs, the *Constellation* class Frigate and LSM, have experienced similar problems.

Navy Shipbuilding Challenges Are Often a Result of Poor Acquisition Decisions

The Navy's shipbuilding challenges are often a result of poor acquisition decisions made during the early stages of shipbuilding programs. For example, shipbuilding programs often are not based on a sound business case—the balance of technologies, design knowledge, funding, and time needed to transform warfighter needs into a product. Poor acquisition decisions are compounded by a budget process that requires the Navy to secure long-range funding commitments before the business case—including resources and design knowledge—is fully understood. Past performance indicates that once funding for the lead ship is secured, the Navy continues to award contracts for subsequent ships as the program's business case deteriorates. The lack of a sound business case results in the following challenges:

- An imbalance between the resources planned to execute a program and the capabilities to be acquired. This imbalance forms during the pursuit to fund lead ship construction, when competitive pressures to get funding for the program are high and many aspects of the program remain unknown.
- Weak business cases often over-promise the capability that the Navy can deliver within the planned costs and schedule.

[6]GAO-18-238SP.

[7]GAO-25-106286.

- As ship construction progresses and these initial business cases predictably begin to erode, Navy shipbuilding programs come under pressure to control growing costs and schedules. This has generally entailed reducing planned quantities, scaling back promised capabilities, and accepting delivery of ships that fall short of the quality-related terms of their contracts. In other words, the Navy pays more to get less.

Past Surface Ship Programs Exemplify Dangers of Poor Business Cases

The Navy's LCS and DDG 1000 programs exemplify the dangers of allowing deficient business cases to fester in Navy shipbuilding programs. Together, these two ship classes—which remain part of the Navy's fleet—consumed tens of billions of dollars more to acquire than initially budgeted and ultimately delivered far less capability and capacity to fleet users than the Navy had advertised. Reasons for this underperformance are outlined below.

Littoral Combat Ship (LCS)

- **Funding commitments based on unstable requirements.** The Navy budgeted and contracted for initial ships (called seaframes in the LCS program) based on its plans to design and construct them to commercial rather than military standards. During construction, the Navy decided that the ships' survivability requirements were inadequate and necessitated additional funding for contract changes aimed at acquiring more robust and capable seaframes, which required significant design churn.
- **Beginning construction with incomplete design disrupted schedule.** Bolstering vital ship components and systems to increase LCS survivability drove design changes that rippled throughout the seaframes. Implementation of new Naval Vessel Rules (design guidelines) required program officials to redesign major elements of each LCS design to meet enhanced survivability requirements, even after construction had begun on the first ship. While these requirements changes improved the robustness of the designs, they contributed to time-consuming out-of-sequence work and rework on the lead ships.
- **Technologies that matured years later than needed.** As the Navy and its shipbuilders worked to resolve seaframe design and construction deficiencies, they had yet to mature technologies associated with: (1) watercraft launch, handling, and recovery systems within each seaframe design and (2) developmental mine countermeasures, surface warfare, and anti-submarine warfare

systems planned for LCS's reconfigurable mission packages.[8] Although these systems were crucial to LCS's ability to perform their planned missions, they have never fully delivered their promised capabilities. Further, as seaframe costs increased and mission needs evolved, the Navy gained insights into performance limitations facing each design, leading it to ultimately scale back its investment in mission package quantities. Consequently, the overall capacity that the LCS fleet can devote to a single, focused mission need is now greatly diminished as compared to the expectations that framed the Navy's business case for LCS.

Zumwalt class Destroyer (DDG 1000)

- **Technology immaturity increases costs.** To meet new transformational goals set forth by the Secretary of Defense, in 2001 the Navy restructured the DD 21 Land Attack Destroyer program into the DD(X) (eventually DDG 1000) Destroyer program. As part of this restructure, the program planned to mature and introduce to the fleet 12 new, developmental technologies, which the program intended to demonstrate using 10 engineering development models. To fund this immense technology development effort and offset rising costs, the Navy reduced planned ship quantities from 32 to 16, then from 16 to eight, and eventually from eight to the current total of three ships. This instability has resulted in each ship costing $10.6 billion, more than seven times the original estimated unit cost.
- **Technologies that informed ship design, but later proved infeasible.** The program's pursuit of 12 technologies took far longer than it initially forecasted, with several technologies ultimately never achieving their planned capability or cost. However, as the Navy extended its technology development timeline, it concurrently moved forward with ship design and eventually lead ship construction. This created several situations where the Navy designed DDG 1000 to provide a specific capability, even though the Navy had yet to demonstrate the feasibility of the technology that underpinned that capability. One example is the class's Advanced Gun System and (planned) Long Range Land Attack Projectile. The Navy moved forward in designing and constructing DDG 1000 class ships with the Advanced Gun System in anticipation that development of the gun's munitions—the Long Range Land Attack Projectiles—would conclude satisfactorily. That did not occur. Rather, as Projectile development progressed, the Navy determined that it would be cost prohibitive to

[8]The Navy sought to embed LCS's mine countermeasures, surface warfare, and anti-submarine warfare capabilities within mission packages. The Navy anticipated that those packages would be comprised of unmanned underwater vehicles, unmanned surface vehicles, towed systems, and hull- and helo-mounted weapons.

acquire the munitions, in part due to unit cost increases associated with buying Projectile stocks for only three ships as compared to 32 or 16 ships.

- **Long acquisition timeline diminished the program's relevance.** After 15 years elapsed between identifying the need for the DDG 1000 program and construction on the lead ship, the program's relevance diminished. During that time, the Navy shifted from a focus on capability needs for operations in nearshore waters to deeper water operations. It determined that the DDG 51 class of destroyers would be more effective for missions than the DDG 1000 class ships. More recently, to provide more relevant mission capabilities to DDG 1000 class ships, the Navy has begun removing Advanced Gun Systems from these ships and replacing them with the new Conventional Prompt Strike weapon system.

New Surface Ship Programs Are Charting a Similar Course as Past Programs

As the LCS and DDG 1000 class stories were unfolding to the Navy, its shipbuilders, and the general public, Navy officials testified before Congress multiple times that it was learning lessons from these programs. For instance, the Navy has limited the introduction of new technologies and leveraged existing designs for some new ship classes. However, it is not clear that the Navy actually learned from its experiences. Newer surface ship programs—the *Constellation* class Frigate (FFG 62) and Medium Landing Ship (LSM) programs—are showing key symptoms associated with deficient business cases, as outlined below.

Constellation class Frigate (FFG 62)

- **Funding commitments based on unstable design.** In April 2020, the Navy awarded a fixed-price incentive type contract for detail design and construction of the lead frigate with options for construction of up to nine additional ships.[9] To reduce technical risk, the Navy intended to leverage and modify an existing Italian frigate design. In August 2022, after the Navy certified to Congress that the basic and functional designs were 88 percent complete, the Navy approved the shipbuilder to begin constructing the lead frigate. At this point, the Navy had exercised options for construction of the first two follow-on ships (FFG 63 and 64). By May 2024, the Navy had exercised options for construction of three additional frigates (FFG 65, FFG 66, and FFG 67)—putting the Navy's total commitment at over

[9]Fixed-price incentive contracts generally include a profit adjustment formula referred to as a share line, as well as a target cost, target profit, and a price ceiling. There are two types of fixed-price incentive contracts: fixed-price incentive (firm target) and fixed-price incentive (successive target). Fixed-price incentive (firm target) contracts are commonly used in Navy shipbuilding programs.

$3.4 billion. This pace of contract actions so soon after the start of lead ship construction led to problems. As we reported in May 2024, the Navy used metrics for measuring design progress that obscured its visibility into the actual basic and functional design progress. As a result, the Navy substantially overstated design progress when it approved construction to begin. We recommended that the Navy restructure its functional design review practices to better reflect actual design progress completed, which the Navy has since implemented.[10] However, the lead ship is now delayed 3 years and construction has effectively stalled as the Navy and its shipbuilder continue to negotiate crucial technical requirements associated with the ship design. This has resulted in the Navy reporting the basic and functional design was just 70 percent complete, as of December 2024, over 2 years after the Navy certified the design was 88 percent complete and construction began.

- **Undemonstrated systems pose technical risk.** The frigate program is leveraging many already proven systems to reduce technical risk. However, our May 2024 report found that two key systems—the propulsion and machinery control systems—pose high risk to frigate capabilities and schedule.[11] These systems include newly designed components and software code that have never been demonstrated on a Navy ship. Nonetheless, the Navy did not plan to fully demonstrate these systems before the previously estimated delivery date (December 2026) for the lead frigate. We recommended that the Navy ensure that its Test and Evaluation Master Plan incorporates—based on anticipated lead ship delivery delays—additional land-based testing activities for these two systems. The Navy partially agreed with this recommendation by stating that it will leverage early opportunities for risk reduction land-based testing, but it does not intend to update its Test and Evaluation Master Plan to include additional test objectives related to the propulsion or machinery control systems. Given that the Navy has previously faced challenges with integrating propulsion and machinery control systems on other ships, this approach increases the likelihood that deficiencies may not be discovered until the ship is at sea, potentially limiting fleet availability and leading to costly repairs.
- **Design changes and resulting weight growth risk undermining planned capabilities.** The Navy and shipbuilder's ongoing reckoning of frigate performance and technical requirements has triggered a

[10]GAO-24-106546.

[11]GAO-24-106546.

series of design changes. These changes have since reduced the commonality between the parent design approach the Navy and shipbuilder pursued during the program's 16-month conceptual design phase.[12] As a result of these changes, in part, the frigate now bears little resemblance to the parent design that the Navy touted as a built-in, risk reduction measure for the program in 2020. Now, in 2025, the ongoing redesign has driven weight growth at levels that exceed available tolerances. Already the Navy is considering a reduction in the frigate's speed requirement as one potential way, among others, to resolve this weight growth.

Medium Landing Ship (LSM)

- **Unrealistic design plans contributed to schedule delays and likely increased costs.** The Navy plans to use LSMs to transport Marines and their supplies from shore to shore in contested operational environments. The program originally intended to leverage an existing ship design to shorten LSM's development effort. However, the Navy determined through industry engagement, such as in concept studies, that existing designs would require significant changes to meet program requirements. For example, none of the existing designs that the Navy assessed would provide needed cargo fuel capacity or meet beaching requirements. A Navy cost analysis also indicated that design changes to meet LSM's survivability requirements could increase each hull's cost by more than $115 million. The Navy planned to award an LSM detail design and construction contract in 2025 but canceled the solicitation in December 2024.

  According to program officials, one of the reasons the program canceled this solicitation is because the offers received for lead ship detail design and construction were hundreds of millions of dollars higher than expected. This turn of events calls into question whether the program's conceptual design activities with shipbuilders effectively positioned the Navy and Marine Corps to understand potential ship design options and to set realistic expectations about the cost and schedule to execute a program that meets both services' requirements. The LSM program is now in the process of revising its cost estimates and schedule, including its timelines to award contracts for detail design and construction and to deliver ships to the fleet.

- **Evolving acquisition strategy is causing short-term delays but may increase design stability before construction.** The original

[12]In February 2018, the Navy competitively awarded conceptual design contracts valued at nearly $15 million each to five industry teams. The conceptual design phase was intended to enable industry to mature parent ship designs and help refine technical and operational program requirements.

acquisition strategy for LSM's detail design and construction contract would not have ensured that—consistent with leading ship design practices—basic and functional design are completed before awarding a construction contract. In December 2024, Congress directed the Secretary of the Navy to certify that LSM's basic and functional design is complete before entering into a construction contract.[13] This congressional action is consistent with our May 2024 findings on leading ship design practices and our recommendation that Navy shipbuilding programs complete basic and functional design before awarding detail design and construction contracts for new ships.[14] According to program officials, this was a contributing factor in the program's decision to cancel its detail design and construction solicitation. Program officials stated that they are revising the LSM acquisition strategy to account for the increased design maturity required by Congress, consistent with our recommendation on design stability.[15]

The Navy's recent performance in the frigate and LSM programs carries too many similarities to its prior performance in the LCS and DDG 1000 programs to presume that the Navy has learned the lessons from its prior shipbuilding efforts and has implemented corrective fixes. The Navy cannot expect to look within its existing playbook to find answers. The ongoing problems with more recent ship acquisitions can provide the impetus Navy leadership needs to look for solutions outside of the existing defense acquisition paradigm. The Navy has an opportunity to do so as it considers upcoming acquisitions, such as T-AGOS 25 *Explorer* Class Ocean Surveillance Ship and DDG(X) Guided Missile Destroyer. Specifically, our work has shown that innovative, effective ship design practices and product development approaches, rooted in industry-leading companies worldwide, provide a new approach that would increase the Navy's chances of success.

[13]Servicemember Quality of Life Improvement and National Defense Authorization Act for Fiscal Year 2025, Pub. L. No. 118-159, § 128 (2024).

[14]GAO-24-105503.

[15]GAO-24-105503.

Leading Practices Offer a New Approach to Meet Modern Challenges

The results of our Navy shipbuilding work over many years demonstrates that leading practices from commercial industry can be applied thoughtfully to improve outcomes, even when cultural and structural differences yield different sets of incentives and priorities. For example, our recent reports on Navy ship design and the *Constellation* class frigate program identified opportunities for the Navy to embrace leading practices to support timely, predictable program outcomes.[16]

To identify opportunities to shorten the Navy's timeline for delivering new capability to the fleet, we compared the Navy's practices to a combination of (1) the leading ship design practices used by commercial ship buyers and builders and (2) broader leading practices for product development.[17]

Leading Ship Design Practices

Our analysis illuminated how the demands pushing the Navy to increase the pace of design and construction for new ships will likely go unfulfilled without reforming practices to improve timeliness, provide greater flexibility, and ensure sufficient design knowledge when making key program decisions (see fig. 3).

[16]GAO-24-106546 and GAO-24-105503.

[17]GAO-24-105503 and GAO-23-106222.

Figure 3: Navy Design Practices Deviate from Leading Ship Design Practices for Commercial Companies

Establish business cases and requirements that support predictable design outcomes

Commercial	Navy
• Prioritizes timeliness of ship design and delivery • Avoids overly prescriptive requirements • Maintains a sound business case through continued reevaluation	• Progresses through an extensive requirements process, with significant time elapsing before detail design and construction contracts • No regularly required reevaluation of approved requirements to confirm their continued relevance

Use iterative design to accelerate design maturity

Commercial	Navy
• Ensures schedule, cost, and requirements expectations are informed by sufficient design knowledge • Prioritizes user involvement in the ship design process • Leverages existing ship designs and systems in digital libraries • Prioritizes timely vendor decisions and information	• Sets expectations for schedule, cost, and operational requirements when design is unstable, resulting in less design knowledge available to inform key decisions and increased program risk • Generally uses a longer, more linear approach—with less consistent user involvement—focusing on new designs with extensive and novel capability rather than speed to delivery • Makes some use of existing ship designs, but lacks a robust design library to support iterative design and shorten time needed to mature new designs • Generally takes extended time to finalize vendor decisions for ship systems and receive vendor-furnished information needed to mature ship designs

Use efficient ship design collaboration and decision-making practices

Commercial	Navy
• Uses processes that support timely design decisions • Aligns decision-making with design maturity measures	• Lacks streamlined, more time-constrained processes, with numerous stakeholders having decision-making authority and contributing to extended cycle times to finalize designs • Lacks consistent design maturity measures and a clear connection between those measures and decision-making

Employ robust in-house ship design capabilities and tools

Commercial	Navy
• Maintains strong in-house design workforce capabilities • Uses ship design tools to shorten cycle time	• Evaluating ways to address acknowledged shortfalls in its in-house design workforce and tools • Adopting modern design tools to varying degrees, with the potential for expanded, more consistent use to provide efficiencies that support shorter, more predictable cycle times for ship design

Source: GAO analysis of commercial company and Navy information; GAO (icons). | GAO-25-108225

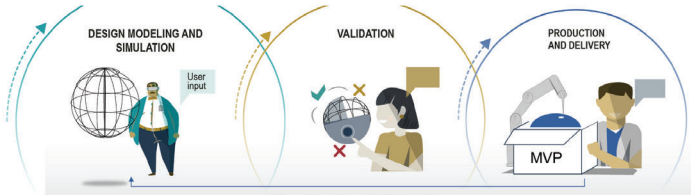
Leading Product Development Practices

At the same time, the Navy has an opportunity to position itself for longer term success by looking outside the world of shipbuilding, exclusively, to the iterative development approaches that leading product development companies in other industries use. As we found in July 2023, iterative development cycles are at the heart of how these leading companies successfully deliver innovative, relevant, essential products to users on timelines that are responsive to those users' needs.[18] Further, in March 2022, we identified four key principles that help characterize how product developments move through iterative development cycles.[19] Figure 4 illustrates the structure for iterative development cycles and identifies how product developers implement the four principles within that structure.

[18]GAO-23-106222.

[19]GAO-22-104513.

Figure 4: Iterative Cycles of Design, Validation, and Production Used for Product Development



Knowledge Gained During Iterative Cycle	Specifications that ensure the design meets most essential user needs	Integrated prototype that is tested in multiple environments to verify performance and can be manufactured as the minimum viable product (MVP)	Optimized manufacturing tools and processes and insight into efficiencies for future iterations
Principle 1: Attain a Sound Business Case that Is Informed by Research Along with Collaboration with Users	Early user feedback during design provides confidence that the design specifications can be developed to meet schedule and cost parameters identified in the project's business case.	Validation includes integrated tests with users in the expected operating environment. As a part of this process, product teams revisit the business case, assessing whether the MVP remains within cost and schedule parameters and still meets user needs.	Leading companies do not view delivery as the finish line, but a springboard for establishing a new business case for the next iteration of the product. Leading companies will structure this business case around improvements to the already delivered MVP.
Principle 2: Use an Iterative Design Approach that Results in Minimum Viable Products	Product teams use digital engineering and 3D printing, along with augmented and virtual realities to aid in rapid design, modeling and simulation cycles. Stakeholders and users access design information using digital twins that contribute information to real-time digital threads.	Product teams conduct systems-integrated tests on a digital twin, or on a physical prototype connected to the digital twin. Each test data input and design update becomes a part of the digital thread. Validation data is available to outside stakeholders to collaborate on design strategies and decisions.	Throughout production, product teams capture manufacturing data. The digital thread documents all the steps in the process, from the design of the machinery and toolset to the processes for manufacturing and assuring the product meets the company's quality standards.
Principle 3: Prioritize Schedule by Off-ramping Capabilities When Necessary	Product teams refine specifications with user feedback, which may result in starting over with new design solutions. Product teams vigilantly monitor product technologies and will not hesitate to defer any to future design iterations if they prove incompatible with schedule and cost parameters.	Product teams make off-ramping decisions for a given MVP largely based on user needs, with the knowledge that some of the capabilities can be added in subsequent product iterations. Because the iterative process provides such opportunities, leading companies more frequently delay capabilities that are not ready until the next release, rather than decide not to provide them at all.	Product teams include manufacturing and supply team stakeholders throughout product design and validation to ensure the manufacturing process can accommodate the design of the product, and recommend design changes if it cannot.
Principle 4: Collect User Feedback to Inform Improvements to the Minimum Viable Product	Product teams obtain user feedback during design simulation and modeling and make changes to the design based on that feedback.	Product teams incorporate user feedback and results from integrated prototype testing—including decisions about the minimum set of capabilities—into the product's hardware and software design, modifying it as needed to prepare the MVP for production.	After product delivery, product teams collect user feedback to inform the next iteration of the product or the design of a new product. Leading companies obtain feedback from a variety of sources, including surveys, customer clinics, showcases, and social media.

Source: GAO analysis of company information; GAO (icons). | GAO-25-108225

In May 2024, we applied the findings of our work on leading practices for ship design and product development in reporting on the Navy's *Constellation* class frigate program.[20] In that report, we identified opportunities for the Navy to move the frigate design and construction away from a traditional, linear development pathway and retool the acquisition strategy for the program's future ships with leading practices in mind. For example, an acquisition strategy structured around iterative cycles could help the Navy deliver future frigates to the fleet at a faster pace and with increased assurance that their capabilities are matched to evolving mission needs. Consistent with leading practices, such a structure would include continuous engagement with stakeholders and users to inform the business case and subsequent design development. It would also use modern tools like digital engineering, a digital thread, and additive manufacturing as key enablers to iterative development, with off-ramping of capabilities used, when needed, to meet schedule interests.[21]

Our May 2024 report on the Navy's frigate program also highlighted the importance of a clear connection between measures of ship design maturity and decision-making. As I noted earlier, we found that, counter to leading ship design practices, the Navy began frigate construction in August 2022 without completing functional design to demonstrate that the ship's design was stable. We also found that inadequate design review practices and metrics obscured the Navy's visibility into the frigate design's progress and presented an obstacle to forecasting realistic ship delivery dates. The consequences of these practices are now well-known, with over $200 million in estimated cost growth to the lead ship and a delivery delay of 3 years. The Navy generally agreed with our recommendations from that report and has taken action to address one of our five recommendations. Specifically, the frigate program has restructured its functional design metrics to ensure that—consistent with our recommendation—design progress measures reflect the quality rather than the quantity of design deliverables received from the shipbuilder.

[20]GAO-24-106546.

[21]Digital engineering, which includes digital twins and digital threads, is a key component of the iterative development that leading companies employ to virtually model, collect, store, and share real-time product data. Additive manufacturing is a computer-controlled process that creates physical objects, such as aircraft components, by depositing materials, usually in layers. During product development, leading companies off-ramp capabilities—or remove them from the planned delivery—if those capabilities are not essential to the core functionality of the product and removing them enable the product to be delivered faster to users than initially planned.

We understand that completing functional design in 3D modeling before awarding detail design and construction contracts, as we recommended in our ship design practices report, represents a significant change to the Navy's traditional acquisition approach for its shipbuilding programs.[22] However, the frigate's functional design problems—and the associated cost and schedule problems that continue to beset the program—emphasize the need for the Navy to stabilize its new ship designs before awarding contracts for detail design and lead ship construction.

The need to ensure a stable design before making major commitments to programs is further underscored when considering the ramifications that program shortfalls can have on the Navy's force structure plans. For example, in the case of the frigate, the Navy's shipbuilding plan for fiscal year 2025 states that recent updates to its battle force structure objectives include 58 frigates. This is a more than an 80 percent increase in *Constellation* class ships from the initial 2022 battle force plans and 34 more ships than the Navy included in its 2016 Force Structure Assessment. However, this increased reliance on frigates to support a larger, more capable fleet is imperiled if the Navy cannot overcome the significant problems facing this program.

In conclusion, until the Navy makes changes to address the weak business cases it puts forward in its shipbuilding programs, we will continue to see the same outcomes. Leading practices offer the Navy a near-term path toward restoring credibility with fleet operators, Congress, and taxpayers. More importantly, over the long term, these leading practices can help redefine the shipbuilding acquisition process in ways that position the Navy to achieve its force structure goals faster, support its industrial base, and thwart potential adversaries' attempts to compete with the superiority of the Navy fleet.

Chairman Scott, Ranking Member Kaine, and Members of the Subcommittee, this completes my prepared statement. I would be pleased to respond to any questions that you may have at this time.

[22]GAO-24-105503.

GAO Contact and Staff Acknowledgments

If you or your staff have any questions about this testimony, please contact Shelby S. Oakley, Director, Contracting and National Security Acquisitions, at oakleys@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement.

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Senator SCOTT. I think the Ranking Member Kaine and I are not going to alternate, going to do a vote, so we'll be in and out. So, I'll start with my questions. Admiral Downey, how long have you had the job?

Admiral DOWNEY. Just over a year, sir. January of 2023.

Senator SCOTT. So you inherited some of the issues you're dealing with.

Admiral DOWNEY. A few issues. Yes, sir.

Senator SCOTT. All right. So, let's talk about the *Constellation*-class frigate. So, it's what, 3 years behind budget. Three years behind way over budget. So, let's talk about what went wrong. So first off, Here's my understanding, tell me if I've got this wrong. The Navy chose the *Constellation*-class frigate based on the parent design of the European frigate used by Italy and France, right?

Admiral DOWNEY. Yes, sir.

Senator SCOTT. The Navy awarded the design to Fincantieri Marinette Marine for about $800 million for the lead ship, right?

Admiral DOWNEY. Yes, sir. With a competition across five folks for about 18 months.

Senator SCOTT. Construction began in August, 2022 with the Navy certifying basic and functional design was complete as required by law.

Admiral DOWNEY. Yes, sir.

Senator SCOTT. A little over 2 years ago, two and a half years ago, right. So how did a ship that started with 85 percent in common with the parent design, fall to 15 percent in common with that parent design, and were those design changes from the Navy or from the shipyard?

Admiral DOWNEY. Sir, I'll start with the design changes. A combination of both. There's a group of about 182 changes, about 80 percent of the changes were requested from Fincantieri to adjust the build spec to their design, all significant changes to get closer to what they proposed. Then there was about 20 percent from Navy.

Of those of Navy, we invoked Build America Act, which changed equipment in the propulsion plant, but that was the decision to start from the first of the class. We canceled a couple systems, the MQ–8, for example, and said, we'll get to that in the future. We reduced speed on the ship. There was a very significant speed requirement in Sea State six beyond what a destroyer would be required. So, there's a combination of changes on both sides, sir.

Senator SCOTT. So why were the changes made?

Admiral DOWNEY. The 20 percent on the Navy side were to change to the requirements that we had proposed and to cancel about three changes there. One cancellation of speed and two other system cancellations because those programs got canceled out. The vast majority of the changes, working together with Fincantieri, were their recommendations to align the build spec change what we put out to closer to their proposal.

Senator SCOTT. So, was that a decision by the Navy or a decision by Congress?

Admiral DOWNEY. The Navy changes were a decision by Navy working with Fincantieri. The other changes were proposed by Fincantieri and Navy agreed to the changes.

Senator SCOTT. Did that increase the cost?

Admiral DOWNEY. Overall, yes, from a perspective of time because design wasn't completed right. So, they fell behind in design and therefore it's contributing to the 36 months.

Senator SCOTT. So, was it a fixed price contract?

Admiral DOWNEY. Yes, it's price contract for fixed price incentive fee contract for building the ship, and the ship builder went with a firm fixed price design contract, through a subcontractor.

Senator SCOTT. Okay, and they won in a bid process, right?

Admiral DOWNEY. I'm sorry, sir.

Senator SCOTT. They went through a bid.

Admiral DOWNEY. They went through a bid with us, and then they contracted to Gibbs & Cox for the design.

Senator SCOTT. So, are they making money?

Admiral DOWNEY. No.

Senator SCOTT. Okay.

Admiral DOWNEY. They're losing money

Senator SCOTT. As a result of losing money, did they slow anything down?

Admiral DOWNEY. Yes. As I said, I took this job I had the opportunity for this command in January of 2024. Was invited to sit through a review a couple months before that, and could see that the reviews needed additional rigor, that the status of production was about 3 percent. But design was reported as holding up production despite the prior estimates of how far design was completed. So overall, what appeared to be occurring to me is the design was being significantly over progressed.

Senator SCOTT. So, the company, the builder, made the decision to slow down because they were losing money?

Admiral DOWNEY. Yes. Because they chose to do a firm fixed price to design contract.

Senator SCOTT. Does that bother you?

Admiral DOWNEY. Yes.

Senator SCOTT. Huh. Okay.

Admiral DOWNEY. To address this, we surged about 80 people up onsite in Wisconsin, with the money invested to drive a collaborative approach to finished design. We expect that functional design will complete by this summer. We've gone from 30 percent first time quality as I took that first review and came into the job to 80 percent, by co-locating Navy engineers, not only with Fincantieri, but also requiring Fincantieri to bring their subcontractor up onsite in Wisconsin as well.

Senator SCOTT. Senator Blumenthal.

Senator BLUMENTHAL. Thanks, Mr. Chairman. Ms. Oakley, I know that the President's announced a new office to oversee shipbuilding, but on the other hand the Musk operation, call it whatever you will, and the Secretary of Defense are evidently going to terminate, fire people, who would be hands-on overseeing and supervising shipbuilding. Am I right that this kind of mass firing of the civilian workforce, many of them veterans would undermine and potentially set back our shipbuilding efforts?

Ms. OAKLEY. I don't have any insight into the specific cuts that Department of Government Efficiency (DOGE) is proposing for the Navy programs or the Navy workforce. I will say that our report

that we issued a few weeks ago on the Navy shipbuilding and ship repair industrial base, identified workforce capacity as a key issue that came up over and over again, both within the Navy and at the builders, as a key challenge for turning things around in terms of performance, both at the yards and within the Navy itself.

Senator BLUMENTHAL. So, building the workforce requires investment in people. It requires morale and a commitment of support to people who show up for work every day, whether it's building submarines or other ships or supervising the process of committing resources to them. Correct?

Ms. OAKLEY. Yes. I think it would be difficult to buildup a workforce without that kind of support.

Senator BLUMENTHAL. Let me ask others here, how do we build that workforce which we've talked about doing for years and years in submarine construction, for example, and it isn't getting done, evidently?

Dr. SEIDLE. I appreciate the question. I think we're putting a lot of effort in our maritime industrial base arena. This body has funded us about $4 billion over the last 2 years, and we have aggressively gone after kind of the workforce hiring and retention.

I think we've seen some good effect on the hiring arena, I think you've seen the buildsubmarines.com at some of our major sporting events, will probably be in the March Madness arena too, on advertisements. We've had 16 million hits on that site, 2.5 million applications. It's led to about 9,700 employees hired in 2023, a 40 percent increase over 22, another 10,000 in 2024.

But sir, those folks are coming and then we're attritting out way too quick. We probably are seeing 50 to 60 percent attrition in our first-year employees and it is about the labor rates. When I was working in manufacturing in the 1980's, minimum wage is $3.35 an hour, and we paid three or four X for $13 or $14 an hour for our labor. Today it's about 1.2 X compared to the living wage, and it's impacting that significantly.

Senator BLUMENTHAL. Electric Boat is doing a lot of great work in its apprenticeship program and its outreach in training, in going into the community colleges and the schools. But I'm hopeful that the Department of Defense can do more to support what they are doing. Especially as we go into the National Defense Authorization Act (NDAA) investing in apprenticeship training. Would you agree that we need to do more of it?

Dr. SEIDLE. Most definitely. I was up at Electric Boat, had a chance to see some of the programs that they have. I think not only is it great from a training perspective, it's the community involvement and it allows people to feel good about their workplace and their environment and their culture. So yes, very supportive of that Sir.

Senator BLUMENTHAL. You would agree that we will continue to need to build more submarines?

Dr. SEIDLE. Absolutely.

Senator BLUMENTHAL. That includes not just *Virginia*-class, but also the *Columbia*-class?

Dr. SEIDLE. Absolutely, yes.

Senator BLUMENTHAL. Would it be a mistake? I think, you know, what I believe to for example, eliminate the *Columbia*-class?

Dr. SEIDLE. It would be a significant mistake. We have maritime dominance in that submarine arena. The *Columbia*-class is the most important leg of our nuclear triad. A critical capability that we need to maintain dominance in.

Senator BLUMENTHAL. Do we need to continue to build the *Virginia*-class?

Dr. SEIDLE. Absolutely, yes.

Senator BLUMENTHAL. These are rhetorical questions.

Dr. SEIDLE. They are rhetorical. We are all in with you, sir, on that.

Senator BLUMENTHAL. I would see no need to ask in a normal time.

Dr. SEIDLE. I understand.

Senator BLUMENTHAL. I'm appreciative that you're on record and I believe the Department of Navy is as well, and I hope the Secretary of the Navy newly confirmed will be as passionate as you and I are.

Dr. SEIDLE. Thank you. Based on my conversations with him, I'm sure he will be, sir. Thank you.

Senator BLUMENTHAL. Thank you. Thanks, Mr. Chairman.

Senator KAINE. [Presiding.] Senator Sheehy.

Senator SHEEHY. Thank you, Interim Chairman, I guess Ranking Member Chairman. Even if we wanted to scale our shipbuilding capacity, even if we wanted to take it to the 10, 20, 30X that we need to even approach what China's building right now. I mean, how do we physically do it? We don't even have the physical shipyards available to build those right now. So, from an industrial based perspective, how do we acquire the physical footprint to start building enough vessels that we're going to need very quickly?

Dr. SEIDLE. So, my first reaction to that, there's a lot of discussion around shipyard capacity and capability. There's a study ongoing right now with the Navy and Cape that will be out shortly, that talks about the capacity and how much more is needed. I think at this point, the workforce issues that we're talking about and the greening of the workforce is leading to lots of rework.

For example, at most of our yards right now, the years of experience is 3 to 4 years. I think unlocking that latent capacity is a lot about driving modernization into the yards, getting through some of these wages issues to have our retention numbers up. All those things start to play. We also are working on a lot of——

Senator SHEEHY. I agree that workforce is key, but I think the workforce will fundamentally and eventually respond to a free-market incentive and is relatively elastic. But, you know, last time we had to build a Navy fast, you know, Henry Kaiser bulldozed 10 miles of San Francisco Bay and built a shipyard. We just don't have that capability anymore. I mean, whether it's ocean front real estate, isn't available anymore.

So, I've heard a lot about the workforce and I totally agree with you, we're very aligned on the workforce issue, I think is critical. But I have not really heard anybody yet talk about the real estate issue, which is how do we get the physical space available to conduct the work when needed.

Ms. OAKLEY. I think one of the things that needs to be considered is looking beyond these big platforms, right? Looking to small-

er, non-traditional capabilities that could provide that decisive capability for us. You know, in that China fight, thinking about things like robotic autonomous systems, leveraging those kinds of things, smaller yards can build those types of ships.

When you're thinking about building up our capacity for shipbuilding in the United States, we can look toward those types of platforms to be the augmenter to the fleet that we need. Not just looking to build, you know, double, or triple the amount of large surface combatants.

Senator SHEEHY. I'd agree, but I think, you know it's always fun to talk about the tactical end of the spear, because that's what's fun to look at. But the reality is the heavy lift, sea lift logistic capability to move a lot of people and a lot of stuff halfway around the world quickly is—that's actually what's more deeply concerning to me. Not the pointed end of the spear, the war fighting end of the Navy, but the ability to lift 500,000 troops in everything they need and all the vehicles they need halfway around the world quickly.

To that end, my second question, and I'll yield back there, is you know, the incentives around shipbuilding and the contractors there, and that Senator Scott alluded to you know, the shipbuilding acquisition model is very dated. You know, it's basically still the same model that we had 80 years ago.

Traditionally and historically, a lot of large naval fleets used leased vessels. Instead of placing the risk on the government to buy the ships and the contractors, basically, there are some risks there, but really the risk on the Navy to buy them.

Has there been any study on exploration of leasing of ships, placing the risk on private companies who would be willing potentially to take that risk to build us a fleet, that it wouldn't probably be right for guided missile destroyers and cruisers and submarines, but it could work for you know, some like submarine tenders, which we're woefully short on right now, I think we have two, we need like 15 and logistical vessels.

Has there been exploration of leasing commercial vessels and putting the maintenance burden, the upgrade burden on the contractors versus on the Navy?

Admiral DOWNEY. I'll take that one, sir. I don't think so. I've been doing this for quite a while and I haven't seen studies on leasing. I'll go back to your other point. We need them produced, we have about 80 commercial vessels under U.S. flag versus thousands under another country. So, it really, I think it goes back to your other point here of how do we increase capacity? So, on the pure Navy side, we do have some in my view, having worked with Maine and California a lot, there is more capacity up in Bath, and there is more capacity out at NASSCO in California. We need to look at our requirements, our variations in builds, and how we get a more- a longer run similar to the DDG–51 program. We're all working on *Virginia* and there's multiple blocks of *Virginia's.*

So that definitely has an effect on the producibility and the learning there. So, I think we have to do both and get to who would produce them for us. We've added Wisconsin Fincantieri Marinette, we've added Austal, and now we have Hanwha in Philadelphia.

We've also looked in the past at reactivating reserve or decommission ships principally the frigate class. That has led to, it's a

dated combat system. We've reactivated some of those ships for foreign countries, but it's would mainly be for coastal patrol. But to your point, we need to do both. We need to grow the shipyards here and look at other acquisition options.

Senator SHEEHY. Thank you.

Senator KAINE. Senator King.

Senator KING. Thank you. I've been waiting 13 years for the timer to break, so there'd be no limit. A couple of sorts of technical observations before I get to broader questions. One is, as you know, the Next Generation Guided-Missile Destroyer (DDG-X) is in the design stage, and the concern from the point of view of the shipyards, both in Bath and in Mississippi, is that there be a smooth transition between DDG–51 and the DDG-X. What concerns us is a timing trough, because you can't turn on and turn off welders.

So, I hope that as you plan out the transition process, that that's top of mind, because it would be disastrous for the yards if there was a lag in demand between the two ships. Doctor, are you with me on that one?

Dr. SEIDLE. Yes, I am. So, we saw the lessons from DDG–51 to DDG–1000 back in the day and how some of that worked out. We clearly are going to be intentional about the transition of DDG–51 to DDG-X, to keep the production line hot, to then feather in DDG-X and then only taper out DDG–51 once DDG-X is up and running.

Senator KING. I'm glad to hear that. Keep that in mind.

Dr. SEIDLE. Yes, will do.

Senator KING. Second point on this developing DDG-X, Ingalls and General Dynamics are working together on the design, which is a new approach, but it's an important one, and I hope the Navy will continue to iterate with them, because having the build yards be involved in the design will make a big difference in terms of construction learning curve and all those kinds of things. So, I hope that project which is underway, will be maintained and the Navy will be forthcoming in terms of communication with the two yards.

Dr. SEIDLE. Yes, just to comment on that, I see that as a great opportunity. We're working with them even before preliminary design phase, and it gets to some of the things that you've talked about, Ms. Oakley, that we need to be doing, so we are excited and we'll be all about it.

Senator KING. Well, having served on this Committee for a while, it strikes me that one of the problems we have is requirements creep. At some point, it has to be pencils down. If you learn anything from the Ford, it's that doing research while you're building a ship is not the way to go.

So, I think, again, that as we move toward DDG-X, we need to say, okay, here's the requirements, here's the design, and let's build it. Not, let's iterate the design as we are moving through the construction process, that's what's really messed us up in some of these major overrun projects. If I were going to list the three biggest problems right now in developing shipyard capacity, the first would be workforce, the second would be workforce, and the third would be workforce. The Navy has to be thinking in unconventional ways.

For example, one of the most important things that could be done to develop workforce is to have childcare facilities, parking, housing

in the area. We've had people recruited to Bath who get there, and then they can't find a place to live. So, I believe that that has to be part of the mentality of developing workforce.

Then of course training, and all those details that go to attracting people in this economy. Finally on the development of the infrastructure, it is the infrastructure itself. There has to be investment. It has to be a joint investment between the private shipyards and the Navy in terms of infrastructure buildings, more efficient layout of the facility and those kinds of steps I think are very, very important.

So, again, I'm giving you advice, but this is based on my experience with working with these shipyards. I guess I would reiterate, oh, I wanted my final question to GAO. You mentioned 60 or so recommendations that haven't been followed. What are the top three that if you had to beep, if you were pressed, what are the top three recommendations that haven't been followed that you think would make a difference?

Ms. OAKLEY. You really pressing my memory on 60 recommendations, but I think most pressing in the front of my mind are our recommendations related to design and the changes that we'd like to see the Navy make with regard to, like you said, ensuring that the design is finalized before we're awarding a contract for construction, and before we're starting to bend metal. Because the problems arise when those design changes start creeping in as the pressures of a fixed price contract begin to mount.

Then that leads to just challenges overall, and it's just exactly what we're seeing with the frigate program. So, we made recommendations to the Navy that they ensure that they have matured their basic and functional design before awarding the contract for detailed design and construction.

Another recommendation that we made was related to ensuring that detailed design on each individual block is finished before you begin construction on that block. Most of those recommendations are really aimed at ensuring that there's less of a likelihood that these surprises will pop up at a time where the pressure's going to be high to continue to proceed because of, you know, schedule or money challenges.

Senator KING. I think this goes without saying, and I appreciate that modularity is king at this point. So, we're building 40-year assets here. They ought to be constructed in such a way that they can be upgraded easily without ripping the whole platform apart. So, I hope those are some things.

The other thing that is something that I've observed, is when we're buying these major objects, we should also buy the Internet Protocol (IP), so that every ship can have its own 3D printer. We don't have to have ships in port, for inordinate amounts of time waiting for a part. So, I hope that's in your planning as well because in this day and age, and by the way, I think the same thing about the Air Force, availability is a big issue in our fleet, and we should improve our availability. We should benchmark against Carnival Cruise Lines, because if they were only available 40 or 50 percent of the time, they'd be out of business.

So, to the extent we can have intellectual property as part of the purchase, then you have the right to make the parts as necessary without even having necessarily to go back into port. Thank you.

Admiral DOWNEY. Thank you for that, sir. I'll hit on a few of those points. Modularity; for the *Ford*-class, we studied in the design that about 40 percent of the cost of modernization goes to rip out. So, for the *Ford*-class, where we have the command spaces, the O–3 level, the gallery deck we went with a general arrangement where all 19 mission bays are lined up against each other and the services are moved out of the spaces.

Heating Ventilation, and Air Conditioning (HVAC), ducting, these things, and built in a flexible infrastructure. So that common bolt size, quick disconnect power panels, lighting, are pressurized under deck so that you don't have any ducting in the spaces. So those type of efforts are modularity that removes I'll say hardware constrained interface or many different such interfaces to the systems, is an area we significantly need to move forward with.

On the tool sets, we also have some, I will say not even balanced efforts, but some solid tool sets in the submarine area and digital arrangement drawings in the carrier area. So that it's not left to an interpretation of the worker. The drawings can be extremely complex. So, we have invested in those areas significantly. Studies show in those areas that such tools, and I have one more point, but such tools can reduce labor by as much as 8 percent as you go through that work.

The other key area on the commercial side, so I have been to Korea, Japan, India, Canada, et cetera, Spain, Italy, and the Middle East. Most of the yards that I've been to that have a large production capability, use a common tool set across the yard. We go by program. So, when we get into yards that have multiple product lines, they may be using different tool sets, until you go into some of the other foreign large yards it's less obvious in our yards of what's going on. They don't change the tool set to the new one, until it's ready to support all their product lines.

Last point is, in our yards where we have multiple lines, they're also managed by program. They're not managed by a governance approach across the yard from the government side. Some of our yards, we have more than half a dozen lines in those yards. So, it goes to the priority of the program and the different government offices integrating.

So, we have been working closely on what is a governance approach that allows shipyard X to get their programs done to cost and schedule in more than a program focused manner.

Senator KING. I appreciate that. You mentioned bolts and I once visited a Toyota plant in Tokyo where they built one RAV4 a minute, one brand new automobile a minute came off the line. They said one of the secrets of the success of that factory was listening to the workers. One of the things I said, well, what kind of suggestions did they make? He said, well, somebody noticed we had 86 different bolts in a Toyota, and we figured out how to make that into about eight. It saved a huge amount of time, a huge amount of acquisition, and that kind of analysis. I think the lesson there is to listen to the workers because they know on the ship deck what works and what doesn't work.

Dr. SEIDLE. Yes. Just to comment on that automotive guy in my past——

Senator KING. Is your mic on?

Dr. SEIDLE. It is. Maybe I'll get closer. Automotive guy in my past, quick story about Toyota and General Motors (GM). When I was working for General Motors, worst running plant in our lineup was the Fremont plant. It had about 55 percent uptime on the assembly line, 20 percent absenteeism, criminal activity. GM gave up and just shut the plant down in 1980 or 1981.

Three years later, Toyota wanted a footprint in the U.S. to make vehicles, we wanted to learn TPS, Toyota Production System, they said, let's use the Fremont plant. We said, no, you don't want to do that, right? Bad karma. They convinced us and then they said, let's hire the people back. We said, no, you really don't understand, you don't want to do that, but they did it. In 3 years it was the best running plant in our lineup, 96 percent uptime, just an incredible work environment. You'd go there and you would see folks on fire for what they were doing at their station.

It was because they were empowered to make changes for what they were doing to improve their work and their efficiency and throughput. It was an amazing thing to see the difference. You're absolutely right that it pays dividends in any manufacturing arena where there's a lot of touch labor, and folks can improve what they're doing. Over.

Senator KING. Thank you, gentlemen. Thank you very much, madam, for your comment.

Ms. OAKLEY. I'll just make a quick comment, because your last comment about talking to the people is in many of your comments are completely in line with our leading practices for product development that GAO has gone and talked to leading companies all across the world and ask them how do they do business? How do they meet customer needs? How do they get products out on time quickly and on budget?

One of the key aspects of that is that user feedback, the people who are actually going to be using the product, give feedback all along the way from the beginning to the end, that drives changes in that design, design drives changes in how it's produced, and then results in providing the customer with a capability that they actually want and will be happy with.

So, I think what you're saying is completely in line with recommendations we've made both to DOD and to the Navy, to bring their practices more in line with how these leading companies do business. Thank you.

Senator KING. Thank you, Mr. Chairman.

Senator SCOTT. [Presiding.] Thank you, Ranking Member Kaine.

Senator KAINE. Thank you, Mr. Chair. I'm going to hopscotch around on some topics. Ms. Oakley, on the last point, I would suggest sometimes GAO go visit a company in Lynchburg, Virginia, Framatome, which is one of the main suppliers in the nuclear base. Framatome is responsible for going out during outages at nuclear power plants.

Outages are not disasters. They're the planned period where they pull a reactor out, retrofit and put it in. Obviously they want to do that as fast as they can, and watching how they are able to do this

work of such complexity, surge it and do it in a very short time so that the reactor is not offline and is actually producing power. It makes me a little bit embarrassed as I think about how slow we are in some other aspects of what we do. So that would be one to put on your visit list.

Ms. OAKLEY. Yes, happy to do that.

Senator KAINE. To Admiral Downey or Dr. Seidle, do you all know how the shipbuilding enterprise workforce has been affected thus far by DOGE or particular directives from the secretary that might be related to DOGE?

Dr. SEIDLE. So, I'll make some comments and I'll let Admiral Downey make a few comments as well on that.

Senator KAINE. I'll accept "No, I don't know yet" for an answer, if you don't really have the sense of it.

Dr. SEIDLE. So, from the earlier comments, I think the first thing that we have been assessing is the deferred resignation program, in the area that kind of I oversee. If you think about the Professional Employer Organization (PEO) community and the supervisor ship builders that he has, it looks like those numbers are in the 3 percent range.

Whenever we look at the number of folks on that list that were probably retirement eligible and decided to say, I'm going to take this now as a result, it drops down to about a percent and a half. So, it is a manageable thing for us when you think about normal attrition.

Senator KAINE. How about on the probationary side?

Dr. SEIDLE. Probationary side small numbers as well. As you know, we've kind of stopped that process. So once again, the numbers in my neck of the woods appear to be manageable to work through, because we have that kind of attrition also on a yearly basis.

Senator KAINE. Admiral Downey, anything different to offer on that?

Admiral DOWNEY. I would offer, I represent a large part of the Navy enterprise, about 90,000 folks, and that they're 90 percent civilian. The deferred retirement number across that enterprise for me is around 1,200 folks. With the offers, these are people who chose to retire. There were very few probationary people that were probationary due to performance.

Senator KAINE. Right. Probationers, you know, for everybody who isn't familiar with this, they're new hires, so they're either brand new or they're career switchers. So, somebody going from active duty to civilian DOD, that's a career switcher who then is probationary.

Admiral DOWNEY. Sir, that's where I was going. My folks hired 7,400 people last year, about 8 percent of the 90,000 and that's not uncommon per year. As we've worked through the definitions, almost all of those folks have been, I'll get the word wrong, accepted or exempted because of the national defense work that they're doing.

The other area was purchase cards. We purchase a lot in our naval shipyards. That's how they buy material. So Portsmouth Naval Shipyard may have more than a thousand transactions a month et cetera. I have in the 10,000 to 15,000 a month across all

these areas, and we were able to turn on, per command, what I asked for to have turned back on.

Senator KAINE. So, everybody wasn't limited to just $1, right?

Admiral DOWNEY. So far, we've very brief interruption, and we've gotten back to what I've asked to have back. On the industry side, across this rest of this decade, the shipbuilding need for what we have booked is to hire about 200,000 people. That's what's needed across that effort. So, the stabilization of programs, the not changing of requirements, that's going to be critically important to these people.

Last one on that, on wages, Dr. Seidle hit where those wages are. Some of our initiatives to focus on a 25 percent increase for the first folks, you know, the first-year people, $20 to $25, that adds about 1 percent to the cost of a ship. A $4 billion ship becomes a 4,040,000,000.

Senator KAINE. You mentioned this to me yesterday and I'm curious about this. So, Dr. Seidle, you were testifying right as I came back from voting about this, the odd compression between, you know, it used to be that a ship builder compared to minimum wage is making, you know, multiply x minimum wage. Now we're down to 1.3, 1.4, which makes the relative attractiveness in a job in the shipyard less.

The point that Admiral Downey made yesterday and today is if you increase sort of beginning salaries, and I guess you do some other adjustments, so there's not unacceptable salary compression, but if you do a 25 percent increase, it changes the cost of a carrier, for example, by 1 percent, because so much more is not in the salary side. That's, an important thing, and I think that's something that we have to grapple with. Here's, a question I was curious about——

Admiral DOWNEY. One point on that, sir, if I may. it's not simply to raise the wage, but if we can retain these folks and have them focused, we're going to deliver closer to schedule and the overall cost is going to come down.

Senator KAINE. Yes. We're dealing with this greening of the workforce and retention is really important. Let me ask you this, I was pleased when the President during his State of the Union on March 4th, announced plans to establish a White House office of shipbuilding to revitalize U.S. shipbuilding industry. I'm just wondering if have you been read in, are there yet details about what that looks like, what's the Navy's plan for collaborating with this White House office of shipbuilding? How might it be structured? Who might the leadership be? This is 21 days after that speech, so maybe the answer is no. But do you know any more about that proposal?

Dr. SEIDLE. At this point it is still early in the discussions on that. We do expect to have solid integration, have been told that we'll be over there regularly having conversations, but to date, we still haven't moved out on our end yet on some of that.

Senator KAINE. We'll want to keep track on that from the Subcommittee standpoint. Over to you Ms. Oakley, and something the GAO had a report that was a December report about amphibious warfare fleet. Navy needs to complete key efforts to better ensure ships are available for marines. The report had this conclusion,

"The Navy is likely to face difficulties meeting a statutory requirement to have at least 31 amphibious ships in the future, given the age of the ships and other factors".

There's a provision in the NDAA at section 1023, that requires that the naval combat force of the Navy shall include not less than 31 operational amphibious warfare ships, but it allows to be counted as operational ships that are temporarily unavailable. What's GAO's perspective on how the Navy is interpreting "temporarily unavailable"? Because we want 31, but we don't want 31 discounted by a deep fraction of "temporarily unavailable" ships that we really can't count on to be.

Ms. OAKLEY. Yes, I mean, I think that report pointed out that some of the things that were considered "temporarily unavailable" were years at a time unavailable and counted toward that total.

Senator KAINE. Would you suggest that in an NDAA, for example, this year, we should take some of that ambiguity out of a phrase, like temporarily unavailable and maybe be a little more specific about what we mean?

Ms. OAKLEY. I think the more specific you can be in giving direction to the Navy would be helpful, because then it leaves it up to their interpretation. The other thing I'd mention is that we have recommendations from 2020, that ask the Navy to reconsider how it defines operational availability, because oftentimes those definitions can be based upon a ship just being able to get underway, but not actually being able to do its missions. Those recommendations remain unopen and there's no action yet on those recommendations.

Senator KAINE. I have one other question I'd like to ask maybe before, I'm sure you have a second round, and I may think of some other things too, but to Ms. Oakley, in your opening testimony, you were kind of assessing some of the challenges that you know, undergirded the report that you recently did about pacing challenges and construction.

One of the things you said, maybe in response to a question, is some degree of sort of unreality between the ships we're putting under contract and the Navy sort of does it with an optimism about the future budget meeting what they've put under contract, and we're not really lining up what we're saying we're going to do with the budgetary resources.

I'm troubled by this. I mean, here's a recent example that speaks to a potential cognitive dissonance. We did a reconciliation bill a couple weeks back, that suggested we should spend about another $150 billion in defense. We're going to continue, on top of what the base budget has been, we're going to continue to work on that. But at the same time as we were doing that, the secretary was sending out kind of the cut memo to the Pentagon, exempting 17 areas, but saying to everybody else, come up with a five to 8 percent cut.

Now, I get it, that just asking for a cut plan does not mean you're going to accept the full plan. Just because you've exempted somebody in round one doesn't mean you won't come back to them later. But it did seem to me a little odd that we were saying we need 150 billion more dollars and at the same time, I'm reading the memo from the Secretary of Defense saying, everybody's got to give me cuts. Maybe the cuts are going to be reprogrammed back in, but

I just worry that we are not really being like cold-blooded and objective and just truthful.

I mean, sometimes the eyes are bigger than the stomach, and we want more than we're willing to pay for, but what is the way we get at that problem? I mean, it's got to be discipline on our shoulders, but it also has to be disciplined over at the Pentagon.

Ms. OAKLEY. I think there's a couple of ways to get at that. You know, when we're talking about realism, we don't just mean that they can't do what they put on paper under their current budget, we mean that they can't do what they put on paper at all. Right?

So, they walk into these programs oftentimes with these unrealistic business cases that say, oh, the technology will mature, the design will work out, that system will get there on time. Then we structure all of the cost and schedule estimates around that optimism, and then they don't arrive. Then that causes cascading delays and problems. Right?

So, then the overall top line that's required increases, instead of putting in the work at the beginning to gain the knowledge that you need to be able to understand, here's what it's going to take to get there, both from a cost and schedule perspective, and then putting forth those realistic budget estimates, those realistic schedule estimates, that match with that.

Now, that doesn't mean that you automatically say, oh, you know what, it's going to take us 20 years to build this ship, and that's just what it is. Right? That's where our leading practices for product development could really be useful to the Navy, because these leading companies, they don't focus on going for a home run every time, they build their products such that they can be designed and iterated on over the course of a number of years.

They put in that work at the beginning to understand what is the most important thing that we need to provide a valuable capability to our customer or to the sailor in this case, and how do we then structure a program that can be done quickly to get that out all while we're thinking about what is the next iteration? what's the next thing that we can get them quickly? That then therefore truncates the amount of money that you need and the amount of time that you need, to look toward devoting that money and could allow the Navy to be flexible and agile to changing threats.

Senator KAINE. Great. Thank you very much.

Senator SCOTT. Okay. I'll just ask a question before Senator Sullivan gets ready. Dr. Seidle, you worked in the auto industry? Were you a supplier or were you one of the big companies?

Dr. SEIDLE. so, first I worked with General Motors for about 13 years, then I was with Alcoa when we stood up a plant to support the big three automakers.

Senator SCOTT. Did you ever get a fixed price contract with one of the Original Equipment Manufacturer (OEMs)? Did you ever agree to build something for a fixed price?

Dr. SEIDLE. I certainly did.

Senator SCOTT. When you did that, did you like take in consideration you might have to pay somebody to do the work?

Dr. SEIDLE. Sure did.

Senator SCOTT. Did you take in consideration what you would have to pay them in wages?

Dr. SEIDLE. Yes.

Senator SCOTT. Probably did, right. After you got the contract, did you go back to the OEM and say, I really don't like this contract, I'd like to get paid more?

[Laughter.]

Dr. SEIDLE. I'll tell you sir; we had several contracts that were underwater when I was with Alcoa trying to really buy our way into that business the first time. So, we dealt with those to your point, right. We owned it.

Senator SCOTT. They were so understanding. Right. They just said, sure, we'll just pay you more money. It was a bid contract and you made the decision to go into that and get the contract and then you lost money.

Dr. SEIDLE. There wasn't enough understanding, sir.

Senator SCOTT. So, when you were doing that, did you say what I heard, that I went down and that the builder just decided to stop working.

Dr. SEIDLE. Yes.

Senator SCOTT. Did you ever do that?

Dr. SEIDLE. No, I did not do that.

Senator SCOTT. Would that have ever helped you get more contracts that OEMs?

Dr. SEIDLE. That would not, sir.

Senator SCOTT. Alright. So, did one of the OEMs ever say to you, you know, I'm really worried about your workforce?

Dr. SEIDLE. Yes.

Senator SCOTT. But did they say, let me give you a whole bunch more money?

[Laughter.]

Dr. SEIDLE. No, they didn't, sir.

Senator SCOTT. So, I mean, what's frustrated me is that these people go bid on these contracts. Like Senator Kaine said, well, you brought it up earlier, that there's been wage compression. I think in a lot of industries there's been a lot of wage compression, but no one told these companies to set the wage at this point. They made that decision.

Dr. SEIDLE. Yes. This gets to the business case issues that Ms. Oakley brings up. Right? The business case has to stand on its own for them and for us both.

Senator SCOTT. Now, it's our job to review. Like when I ran an auto company, we were a supplier to the big companies. So, for my contracts, I had to reduce my prices. I defined productivity gains every year, year after year after year, I lost a contract by contract. They never came to me shocking and said, let me just give you a little bit more money, I feel sorry for you.

Dr. SEIDLE. Yes.

Senator SCOTT. Just makes you mad that these people go out there, and what you've said is, they're bitching because they can't get the workforce. Whose responsibility, is it? They bid for their own contract.

Dr. SEIDLE. In my opinion, the business cases right now are not where they need to be for both our industrial partners and ourselves. So, then we have some of these contracts that are pre

Coronavirus Disease (COVID) contracts as well and ultimately, we find ourselves in a tough situation.

Now, sir, I will also tell you I am a proponent of working closely with them right now to get to the right answer, to make these adjustments, to do the right thing, because our Nation needs it. Also, as I've been out there meeting with them, I see industrial partners that are willing to come to the party as well with us. I can't speak to what's happened the last two or three decades on that front, but I can tell you what I'm seeing now.

Senator SCOTT. Right. Senator Sullivan.

Senator SULLIVAN. Thank you, Mr. Chairman. Great questions. It's good to have a businessman as a Senator.

[Laughter.]

Senator SULLIVAN. Okay, boy, oh boy. I don't even know where to begin on this topic, but I think the really good news is, as the President of the United States and everybody on this Committee, bipartisan group of Senators, we all want to get at this problem, fix this problem. Boy, I don't even know where to begin.

Let me begin, Ms. Oakley, great job on your guys' newest study that came up, your report. I sent it to the incoming Secretary of the Navy and said, you should read this. Very quickly, from your big analysis, the top three things, if you've already said it, say it again, that you think we should be doing.

Again, the big idea here is that everybody wants to fix this, the President, the Secretary of the Navy (SEC NAV), all of us, so that's not always the case in Congress. We're willing to put a lot of money toward it, but that's not always needed either. What are the big three that you would recommend succinctly here?

Ms. OAKLEY. I think you're referring to the industrial base report that we issued, right?

Senator SULLIVAN. Yes.

Ms. OAKLEY. So, from that report, I think the biggest thing is that the Navy needs to ensure that it seizes this bipartisan support and opportunity that it has with all the investments that are going in to address the industrial based challenges and issues. So that report, as you note determine that the Navy didn't really have metrics in place to——

Senator SULLIVAN. Or a strategy for that.

Ms. OAKLEY. Or a strategy to guide those investments.

Senator SULLIVAN. The last Navy Secretary and God love them—but you know, when you're getting the climate action report to Congress, which is not required by Congress, you're talking about climate change all the time and not shipbuilding. No wonder we're in this disaster, but I'm going to look toward the future.

[Laughter.]

Ms. OAKLEY. Well, that takes me to my next point in looking toward the future. So, the Navy kind of has two problems here, right? As Admiral Downey mentioned, there's already 90 ships under contract, I think that amounts to about $150 billion backlog of ships. So, the ship in some cases has already sailed on those products. So, what they can do in that regard is look toward gaining that knowledge about design, ensuring designs are stable before construction begins, so that that construction progress isn't disrupted and we're not talking about design changes.

Senator SULLIVAN. Okay. Can I really, I want to touch on that point. Did you guys see the Wall Street Journal piece? They did a really good piece recently on, I'm trying to think of what ship it was.

Ms. OAKLEY. Frigate.

Senator SULLIVAN. It was on Frigate and all the change orders that just killed it. I had the honor of having lunch, just a week ago, with the former Secretary of the Navy, John Lehman, who was responsible for building Reagan's 600 ship Navy. Pretty impressive, right? The size of the U.S. economy was about one third of that size than we are today, the employment, and these guys just focused and built a gigantic navy. They helped us win the cold war. He did it. He was secretary for 6 years. I said, Mr. Secretary, how'd you, do it, and what's the number one thing? He said, change orders.

I stopped him. I said, once we get through a phase done, done. He told me all the examples of industry and everybody, some big top guy in the industry tried to get him fired. He says, we're done, no change, build that ship. Build 30–40 of them, maybe come back after that. Build the ship, stop with the change orders.

I think the Navy right now is almost the opposite. That Wall Street Journal article was, heck every time some captain in the Navy had a new idea, it was a brand-new change order it seemed like on that ship. So, would you agree that that's like a huge one? Certainly, Secretary Lehman thought it was huge, and that guy knew what the heck he was doing, right? He built the 600 ship Navy under Reagan.

Ms. OAKLEY. I think that when you're talking about being able to snap a chalk line like that and say no more change, you have to make sure that you've done the work to understand that you can even actually build the ship that you've designed. So, our recommendations would focus on doing that upfront work so that you can snap that chalk line, and be assured of the ship that you're building and the timeframes and costs with which you're going to be able to build it.

Senator SULLIVAN. Okay. It's a great point, because it's not like we've never done this before, right? It's not like we don't know how to build Navy ships. It's not like we don't know how to build a giant fleet. We just need to relearn our lessons from the past. Would you agree with that?

Ms. OAKLEY. I agree. The Navy knows what it's doing.

Senator SULLIVAN. Admiral, let me ask you, it's a really big question and you're the perfect guy to answer it. So, you know, we have this great impeccable culture of excellence and safety record in our nuclear reactor program. The head of Navy nuclear reactors is an Admiral, starting with the legendary Hyman Rickover, who has an 8-year billet. You think that's part of the reason Navy nuclear reactors has been so successful?

Admiral DOWNEY. Certainly, is part of it. Continuity is important in these complex projects.

Senator SULLIVAN. So, I had a provision last year in the NDAA that said, your job, NAVSEA, which oversees all the shipbuilding from design to building, should have an 8-year billet. A little radical, but I took the example from the Navy nuclear reactors. How long is your billet right now?

Admiral DOWNEY. Three years.

Senator SULLIVAN. Okay. Three years.

Admiral DOWNEY. Typically, it's a year or two extensions. You start with 3-year orders——

Senator SULLIVAN. Oh, do they normally extend you?

Admiral DOWNEY. Oh, yes.

Senator SULLIVAN. Okay. Well then that makes my amendment even smarter. Because I think you're a Vice Admiral, by the way. Is it always a Vice Admiral? NAVSEA?

Admiral DOWNEY. This job it's been a Vice Admiral since the seventies.

Senator SULLIVAN. Okay. So, I think you're a great Vice Admiral, but when you're two, 3 years in, you're three, and this is nothing against you or all the other Vice Admirals, this is a really big job. You're probably like, I wonder if I can make admiral. So, you're looking around and you are kind of maybe not so focused. I'm not saying you; I'm just saying generically.

So, the Senate in a debate, right in this room, good debate, I got Democrats, Republicans pushed back on me and by the end they were like, geez, Dan, this makes a lot of sense. Let's do 8 years, NAVSEA, like the Navy nuclear reactors head in the last 3 years. He's a full Admiral, four star and that way, and it's your last job, just like Navy nuclear reactors.

Now we were told the Pentagon and the Navy hated my idea. When it went to conference, they stripped it out. So, there you go. In innovation that I think was pretty darn good, you're even telling me that normally it's 3 years, but they say, oh, you might be extended one or two if we need you. No, let's just say like Navy nukes that NAVSEA should start as a three star, get promoted to a four star, 8 years.

So, you are responsible designing and building ships. Three years, I mean, how long does it take to build an *Arleigh Burke* guided missile destroyer, typically?

Admiral DOWNEY. About 5 years. Yes.

Senator SULLIVAN. So, you can't even oversee the building of one ship, is that correct?

Admiral DOWNEY. Not from start to finish.

Senator SULLIVAN. No, you can't. How about a frigate, how long normally?

Admiral DOWNEY. Well, frigates from the past, we're still working on that schedule now.

Senator SULLIVAN. I know you are,

Admiral DOWNEY. But this started in 2022, and we're forecasting a 3-year delay, so 7 years. But it should be back to the 4-ish year point of view.

Senator SULLIVAN. But even that's 4 years, right?

Admiral DOWNEY. Yes, sir.

Senator SULLIVAN. Okay. So now I know you probably need to get permission from Big Navy to answer this question, but what do you think about the idea of having the NAVSEA, like the head of nuclear Navy nuclear reactors being an 8-year billet, oversee it, own it, and then you retire as a four-star Admiral when you're done. Just the way Admiral Rickover did, just pretty much everyone else did, with the exception, I think of Admiral Richardson who

did such a good job, he was promoted Chief of Naval Operations (CNO), but that was unusual. What do you think of that idea? Especially, how many years are you into your current billet?

Admiral DOWNEY. Just over a year. January of 2024.

Senator SULLIVAN. So, you think you'd be able to do a better job if you were looking at your current billet and say, I have seven more years to turn this machine around. Or right now, you're like, geez, I got two more years left. I'm wondering if I'm going to make four-star Admiral. I wonder if I should be looking around. What do you think is better for you?

Admiral DOWNEY. So, a couple technical nuances, there is no four star. I'm an engineering duty officer, so our last four star was Admiral Rickover.

Senator SULLIVAN. We can make the NAVSEA Admiral in his final 3 years of an 8-year billet, a 4-star admiral.

Admiral DOWNEY. I understand, I'm not out looking for another one, not that I wouldn't love to stay.

Senator SULLIVAN. None of this is—I'm using you as a generic example. None of this is directed at you. You're doing a great job.

Admiral DOWNEY. What I would offer is, my most complex jobs I've had have been more than 3 years. Not by initial design, but I had a certain destroyer program and I wasn't leaving even after selected for flag, until that ship was delivered.

Senator SULLIVAN. Isn't that making my point? If NAVSEA typically gets extended beyond 3 years, which sounds like it does. Doesn't that make the point of what we're trying to do here? Because this Committee, in the U.S. Senate agreed with the amendment we passed, that amendment got stripped out in the house conference.

Admiral DOWNEY. Continuity is usually a good thing. Then you can do whatever you need to do to the person if they're not performing. Another nuance, it's a little complicated, just my personal comment, as you promote halfway through, who relieves you? There's a three-star reliever. So, it's a little—the long runs got to be thought of.

Senator SULLIVAN. Don't we do that with navy nuclear reactors?

Admiral DOWNEY. No, that's four star relieves a four star.

Senator SULLIVAN. Alright. We will figure that out. Anyone else have a view on that from our experts here? I'm way over my time, sorry.

[Laughter.]

Dr. SEIDLE. I'll answer it with a question. Any large corporation that has complex products, do they change out their leadership that quickly?

Admiral DOWNEY. There you go.

Ms. OAKLEY. That's consistent with my knowledge.

Senator SULLIVAN. Okay. Thank you, Mr. Chairman. I think I'm going to make another attack at this idea, and hopefully the Navy will agree with us and not fight to kill it, which they did successfully last year.

Senator SCOTT. Thank you. Admiral Downey could a ship builder, let's go back to what Senator King was talking about. Could a ship builder act on recommendations from its workers such as standardizing the bolts or making other changes as Senator King

suggested? Or would it take years to get the change qualified and approved by the Navy?

Admiral DOWNEY. Thank you for the question, sir. It depends upon what the change is, what the Senator was referring to, are Gemba walks, you're at the water for, I'm sure you're familiar. So, we have been on the surface maintenance side in the last 20 months, we've doubled the on-time delivery. We have been doing Gemba walks for about the last 3 years, of what is holding things up, how do we go faster? Getting it into the larger complex system, it takes longer than that, and we've seen that.

So, we've been really focused on additive manufacturing efforts. We've got about 15 different major projects going on and moving those parts as an example, from 900 to 9,000 available. We need to move much quicker here. We are not moving quick enough.

Senator SCOTT. You know what, I don't understand. I was never in this shipbuilding business. But I don't get why it would take that long to build a ship? I mean, you have all the parts and so why would it take, I mean, you can see maybe it'd take 2 years to build a ship, but 4 years, 5 years, 8 years. I mean, if you just start, think about it. If the way we do manufacturing in this country, it didn't seem like it would take that long, right?

Admiral DOWNEY. So that's an area we need to improve, we don't have all the material upfront. We buy it throughout. So, the Committee Congress has supported us significantly in the last few years of changing advanced procurement, from 2 years to 3 years. Half of our material in the last three to 4 years, 5 years has taken half as long again too. So, we don't start with all that material there.

Even if it's a follow-on multi-year, we need to affect that and make sure we're ready. We need better efforts in getting the jobs for the workers that the hours that are effective as we analyze them, it's not where it needs to be. They're back and forth to the work site.

Senator SCOTT. But that's the responsibility of the company that bid on this contract.

Admiral DOWNEY. Yes, I'm not arguing, sir.

Senator SCOTT. That's what's frustrating about this, is that's their job. Have we asked you that when you were in the auto business? Did they? No

Admiral DOWNEY. I agree with you.

Senator SCOTT. How long does it take to build a cruise ship?

Admiral DOWNEY. It's closer to the couple of years.

Senator SCOTT. Do you know?

Ms. OAKLEY. Yes. We benchmarked and the longest commercial ship that we benchmarked took 52 months. The quickest Navy ship that we benchmarked was somewhere around 90. It was a complex commercial cruise ship.

Senator SCOTT. Took 52 months

Ms. OAKLEY. At most.

Senator SCOTT. What was the, like the second one when like Royal Caribbean has all these oceans or whatever—well how much of the second one after they built that first one at that design?

Ms. OAKLEY. I don't have that data, but it's never longer.

Senator SCOTT. Golly. It just doesn't make sense. I mean, it doesn't make any sense to me why we're doing this. So, Dr. Seidle, why did the Navy use a firm fixed price contract for the design construction of the frigate? What was the rationale and do you think this was right?

Dr. SEIDLE. I can't speak to the rationale of that, and honestly, Admiral Downey might have better sight picture on that. We certainly talk a lot about firm fixed price for lead ships is not what we typically want to do, right? That's not how we are typically trying to roll. So not sure about the decision back at that time. I can pull the thread on that or if Admiral Downey has additional insight. But it's not typical what we would do for a lead ship.

Senator SCOTT. Go ahead.

Admiral DOWNEY. The Navy awarded a fixed price incentive fee with the ship builder for a first of class, and then the ship builder awarded a firm fixed price with their subcontractor. I don't know why we didn't say, why are you doing that? How is that risk balanced? But we also awarded a fixed price incentive fee for Tactical Auxiliary General Ocean Surveillance (T-AGOS), for example.

So, you can trace this back several years ago, that there was more than two, there was three or four programs that we're starting first of class with and we're doing fixed price. Having been involved with this business a long time, generally that's not a risk balanced approach for first of class.

Senator SCOTT. Ms. Oakley, so when you give them these ideas and then they don't do them, do they tell you you're crazy? Do they just ignore you? What do they do?

[Laughter.]

Ms. OAKLEY. Thankfully, I've never had anybody in the Navy tell me I'm crazy.

Senator SCOTT. Do they just ignore you?

Ms. OAKLEY. Yes, It's just a lack of action in a lot of different respects. I think also too the recommendations don't get elevated to the level that they need to be, to be able to be resolved. I'm glad to be able to work with Dr. Seidle you know, going forward on how we can get some of these recommendations implemented.

Dr. SEIDLE. Okay. I'll, make a comment on that. We met last week to talk about this as well and spent some time together. I think in the past we typically are talking to each other via reports, which is not really the way to get after it. I think we can do a lot better job of working closely with her office and I mean that sincerely.

Senator SCOTT. You know, going back to what Senator Sullivan said, the problem you have if you sit here, who's responsible? Nobody. Because we change people out all the time. So far, like can you say John was responsible or Sally was responsible for the frigate not being done on time?

Admiral DOWNEY. No.

Senator SCOTT. In business you could.

Admiral DOWNEY. Yes sir. No. multiple folks involved in multiple turnovers over that period of time.

Senator SCOTT. Has anybody been held accountable?

Admiral DOWNEY. Not from a termination perspective.

Senator SCOTT. From a, didn't get promoted?

Admiral DOWNEY. Yes. I will share, I've terminated for cause, relief for cause, multiple folks. I terminated the *Ford* program manager when I was the PEO, I terminated the shipyard, Chief Executive Officer (CEO) and Executive Officer (XO) out in the far east this fall. Those aren't decisions that you ponder. It's not fun, but those are decisions that have to be reported to Congress and you got to move out on it. Overall, where that is appropriate, it has in the longer run a positive effect on the workforce and the product line.

Senator SCOTT. Yes. You know, in business, no one wants to fire anybody, right? It's not your fun day, right? Boy today am excited. But if you don't, then nothing happens. I'm done.

Senator KAINE. Senator Shaheen is on her way, so as soon as she comes in I'll depart. Tariffs on aluminum and steel, how might that affect the cost of these inputs into a supply chain where we're already seeing costs go up faster than the rate of inflation?

Dr. SEIDLE. So, we're having those discussions. It's a little early from an assessment perspective. You know, probably about half of our aluminum and a third of our steel in 23 came from Canada. Clearly tariffs in those arenas could drive cost. But having said that, the steel plate and bar for our shipbuilding efforts, most of it is domestically sourced. But we are expecting impacts, but we don't have our hands around yet what those impacts are yet.

Senator KAINE. Would it be hard or easy to go from, you know, 66 percent domestic to a hundred percent domestic, like that?

Dr. SEIDLE. I don't have the——

Senator KAINE. It'd be hard. Let me say one last thing and Senator Shaheen's about to arrive and I know I have a couple of questions. Just on the matching our reality to our budget, I'm very pro Australia, United Kingdom, United States (AUKUS). I think it's great. I think we need to have more alliances in the India Pacific. We need to deal with the China threat that the Chair discussed.

But I am worried about this reality to budget and in particular, given that the Australian Parliament did something that I just shuttered to contemplate what it would be like if we tried to do this here. They had a debate and they voted to give the U.S. $3 billion for the United States workforce to help build subs for Australia.

So, imagine we were having a debate on the floor of the Senate about we want to give the UK $3 billion to help us do something. It would be a very tough debate. They did it and they made the commitment and it demonstrates the concern that they have about China, obviously. But we have a lot at stake in trying once they have gone out on that political limb way out on the limb, we've got all lot at stake in trying to make sure we can meet the commitment.

So, we need to meet our own needs for sure. But that's a huge commitment that they've made to us, and we need to reciprocate with that. I yield back, Mr. Chairman. Thank you.

Senator SCOTT. Senator Shaheen, are you ready?

Senator SHAHEEN. So, I think this is for Dr. Seidle. Am I pronouncing your name correctly?

Dr. SEIDLE. You most certainly are, ma'am. Thanks.

Senator SHAHEEN. Alright. As you know, at our Nation's four public shipyards, and actually Senator Kaine may have raised this concern, the maintenance and sustainment mission is critical. With that in mind, I wanted to ask about the future of the Single Integrated Operational Plan (SIOP) program, which is very important to the Portsmouth Naval Shipyard. I hear that the Navy's getting close to a decision on the infrastructure upgrades that are required for the *Ford*-class carrier program at the Puget Sound Shipyard. That this will be the largest construction project that the Navy's ever undertaken.

While I understand that the Navy has said it will not impact other SIOP projects that are already underway, I want you to reassure me that that is in fact the case because there are a number of projects underway at the Portsmouth Naval Shipyard that will be affected if there are impacts on other yards that already have SIOP projects under construction.

Dr. SEIDLE. Yes, thank you for that question, ma'am. The multi-mission dry dock obviously, in the infrastructure upgrades is an important effort that we are absolutely looking at, and intend to move forward with.

I think it's fair to say no impacts to current SIOP projects that are ongoing right now. We have about 6.3 billion worth of projects across 51 different projects. It includes dry docks up at Portsmouth, two of those there. We got a dry dock at Norfolk; we got a dry dock going in at Pearl as well, and so those efforts are all ongoing. The Multi-Mission Dry-Dock (M2D2) is about 80 percent complete from a design perspective.

Like I said, we don't expect impacts to current SIOP projects, but we will obviously prioritize funding and SIOP issues going forward. Some of that will play out in our decisionmaking and we'll continue to update via kind of our SIOP 5-year plan.

I'm bullish on like SIOP is doing great things for the Navy, Mark Edelson and his team are really doing good work. Not only solving some of these infrastructure issues that we've had forever. Somebody was saying you know, our most recent built shipyard is in 1908. We don't often think about it that way.

Senator SHAHEEN. New Hampshire goes back to 1800, so——

Dr. SEIDLE. I know, right? So just great work ongoing there. Also, a lot of industrial equipment, you know, 500 million and probably 237 pieces of equipment, I think is the number. So, we are committed to stay in the course on SIOP in perpetuity. So, we'll continue to keep you updated and apprised as we move forward.

Senator SHAHEEN. So, as you're thinking about the commitment and Puget, what's the timetable? So, what should people who are watching this be considering as they're thinking about where the decision points are for what's going to happen?

Dr. SEIDLE. Yes, ma'am. I'll take that question for the record and get back with you from a timing because I don't want to misspeak on that because I know it's an important piece of the equation. But we'll take that for the record and come back to you.

Senator SHAHEEN. Okay, thank you.

Admiral DOWNEY. Ma'am, I can offer, being responsible for the shipyards. I have just had an update this morning on how it's going in Portsmouth on the dual docking capability, and overall

going well. That project is well ahead of M2D2, but your senses are right. It's a large project, M2D2, *Ford*-class carrier docking capability and major electrical upgrades.

As we go through these SIOP reviews and decisions, there's two constant themes of the reviews. How is it going to affect the work of the ships that are being processed through the yards? Then how is it going to affect the other projects?

So, these are themes at the highest levels of the Navy as we go through, and we'll get the specific dates, but roughly M2D2 is, I'll use the phrase, a slow start around the 2028 timeframe and 2030 kind of the large start. That's the rough timeframe and we'll come back and validate. A lot of that of course depends upon where we are in the budget process and what the national priorities are.

Senator SHAHEEN. Will the fact that we're in a continuing resolution for the remainder of this year affect that?

Admiral DOWNEY. The continuing resolution approach will affect some of the maintenance decisions for some of our platforms, but not the construction projects that I'm aware of.

Senator SCOTT. Okay.

Senator SHAHEEN. Thank you, Mr. Chairman.

Senator SCOTT. All right, thanks to the witness. Thanks for coming, thanks for your testimony. We're going to leave the record open for 3 days to take questions for the record.

This concludes the meeting.

[Whereupon, at 4:09 p.m., the Committee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR TOMMY TUBERVILLE

ACTIONS TO AVOID PAST FAILURES

1. Senator TUBERVILLE. Dr. Seidle, the same Navy failed acquisition strategy used on the *Constellation*-class Frigate is also being used on *Stalwart*-class auxiliary general ocean surveillance ships (T-AGOS). We have a constantly changing ship design on a firm-fixed price contract for six ships. What specific actions are you taking with T-AGOS to avoid repeating past failures?

Dr. SEIDLE. The Navy is applying lessons learned from the Frigate program and applying them to the *Explorer*-class ocean surveillance (T-AGOS) program. One such lesson learned is that the program will avoid over-progressing its metrics regarding design maturity. Additionally, the Navy has established an increased and continual onsite program and engineering presence at the shipbuilder and a critical subcontractor to address technical challenges. Contractually, the detailed design was split from the construction of the lead ship. The lead ship was awarded in May 2024, but to prevent challenges encountered with early construction, the shipbuilder is not authorized to begin construction until the Navy has completed all applicable design reviews and conducted a Production Readiness Review.

2. Senator TUBERVILLE. Vice Admiral Downey, the same Navy failed acquisition strategy used on the *Constellation*-class Frigate is also being used on T-AGOS. We have a constantly changing ship design on a firm-fixed price contract for six ships. How are you controlling the Navy's engineering authorities differently on T-AGOS to avoid constant changes?

Vice Admiral DOWNEY. To meet operational requirements, the *Stalwart*-class auxiliary general ocean surveillance (T-AGOS) 25 will be the largest and fastest Small Waterplane Area, Twin Hull (SWATH) Hull) ship designed and built in the United States. The Navy is working closely with the shipbuilder on the design and providing onsite engineering expertise and assistance to help design this unique ship.

T-AGOS uses a different design strategy from the Frigate, with a heavy reliance on commercial technology and requirements. The Navy's technical authority on aauxiliary ships, such as T-AGOS, is more limited than on combatants such as the Frigate. Auxiliary ship technical authority largely relies on commercial regulatory

bodies, such as the American Bureau of Shipping and industry standards groups, and the Institute of Electrical and Electronics Engineers. The Navy has technical authority over a select few key performance parameters identified in the capability development document (CDD), military-specific requirements, or higher technical risk areas of design.

The T-AGOS requirements as defined by the CDD have remained stable, with no changes since November 2021. Contract specification changes to date have been mostly minor administrative changes, clarifications, or relief from requirements as requested by the shipbuilder.

QUESTIONS SUBMITTED BY SENATOR MAZIE K. HIRONO

FIRST-OF-CLASS TRANSITION CHALLENGES

3. Senator HIRONO. Dr. Seidle, persistent difficulties in transitioning first-of-class ships from design to full-scale production is leading to unforeseen complications and setbacks. The *Constellation*-class frigate has been affected by this issue. What steps is the Navy taking to ensure better design maturity before starting construction on first-of-class vessels?

Dr. SEIDLE. Along with production readiness, design maturity is certainly one of the key indicators of readiness to begin ship construction. The Navy is more aware of the consequences of beginning construction before achieving requisite design maturity levels. We appreciate this focus from Congress, on behalf of the taxpayers, and are redoubling our focus on achieving necessary levels of production readiness and design maturity prior to commencement of construction. We are focused on 'World Class Shipbuilding and Design'—developing a pragmatic method for: measuring and communicating levels of design completion; performing meaningful production readiness reviews prior to commencement of construction; and increasing focus and engagement by senior Navy leaders in these efforts.

4. Senator HIRONO. Vice Admiral Downey, how is the Navy implementing lessons learned from previous first-of-class delays to avoid repeating the same mistakes in future shipbuilding programs?

Vice Admiral DOWNEY. The Navy is actively incorporating lessons learned from first-of-class shipbuilding delays by emphasizing requirements stability, design maturity, robust prototyping and testing, and improved integration of new technologies before construction begins. Programs are adopting a "design-then-build" approach, which prioritizes mature designs and systems engineering to minimize costly rework and schedule slips. Additionally, the Navy is enhancing collaboration with industry through integrated product teams, leveraging technology to improve the design process, and using digital tools to identify and manage risk earlier in the process. These steps aim to improve cost control, schedule adherence, and overall program execution on follow-on ships.

CONSTELLATION-CLASS FRIGATE

5. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, the *Constellation*-class frigate program is intended to provide increased lethality, survivability, and affordability in an era of great power competition. However, the Secretary of the Navy's (SECNAV) shipbuilding review highlighted challenges with design maturity, first-of-class production delays, and cost overruns. These issues raise concerns about whether the program will meet its delivery timelines and intended operational effectiveness. The *Constellation*-class frigate is based on a parent design, yet the program has encountered unexpected design integration challenges. What are the primary factors contributing to these difficulties?

Dr. SEIDLE and Vice Admiral DOWNEY. The difficulties are driven primarily by two challenges: one, adapting the parent design to U.S. Navy survivability and lethality standards; and two, workforce challenges consistent with industry-wide trends. This includes difficulties in hiring and retaining white collar workers, which includes design engineers, thereby impacting design completion and production schedule. The *Constellation*-class Frigate is projected to meet all operational requirements, including those for lethality and survivability, and to reach full operational effectiveness.

Ms. OAKLEY. The Navy sought to build the *Constellation*-class frigate based on the *Bergamini*-class European Multi-Mission Frigate. This approach sought to leverage the approach that leading shipbuilders take of using existing ship designs to speed design maturity and reduce technical risk when building new ships. However, as the Navy and its shipbuilder embarked on *Constellation*-class design development, their

implementation of this leading practice was quickly sidelined by differing interpretations of Navy technical standards established in the contract—including the time-consuming process for implementing those standards, use of flawed design completion metrics, and decisions to begin lead ship construction prior to attaining a stable design.

First, the Navy underestimated the technical complexity of adapting a foreign design to meet Navy requirements. This underestimation caused the Navy to substantially modify the frigate design from the parent design that was selected during the 16-month conceptual design phase. As a result, the Navy and shipbuilder continue to grapple with implementing the technical standards set in the contract, which has delayed the program at least 3 years from initial estimates. The frigate now bears little resemblance to the parent design that the Navy touted as a built-in, risk reduction measure for the program in 2020.

Second, as we reported in May 2024, the Navy used metrics for measuring design progress that obscured its visibility into the actual basic and functional design progress.[1] We recommended that the Navy restructure its functional design review practices to better reflect actual design progress completed, which the Navy has since implemented. This has resulted in the Navy reporting the basic and functional design was just 70 percent complete, as of December 2024, over 2 years after the Navy certified the design was 88 percent complete and authorized lead ship construction start.

Last, the Navy approved the shipbuilder to begin construction with a largely unstable design, including incomplete design knowledge of structural, piping, and other critical components. The Navy's approach is inconsistent with leading ship design practices, which calls for functional design to be complete before beginning construction. As a result, the lead ship is now delayed 3 years, and construction has effectively stalled as the Navy and its shipbuilder continue to negotiate crucial technical requirements associated with the ship design. A silver lining to the current situation is the Navy limited its financial liability by using a fixed-price incentive contract, which limits its cost risk to the combined total of ceiling prices for the six frigates currently under contract.

6. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, has the Navy fully assessed the lessons learned from previous first-of-class shipbuilding programs, such as the Littoral Combat Ship (LCS) and *Zumwalt*-class destroyers, to avoid similar cost and schedule overruns?

Dr. SEIDLE and Vice Admiral DOWNEY. The Navy, in partnership with our shipbuilders, have assessed the performance of recent programs to improve shipbuilding on current and future shipbuilding programs. Examples of improvement efforts include the early engagement of shipbuilders on our Future Destroyer (DDG(X)) Program to ensure the ship is designed for producibility. In addition to this, the Navy and our partners are working to determine the best timing for authorization of lead DDG(X) ships in order to bring DDG(X) construction online at a time that coincides with ceasing production of DDG 51 Class ships, thereby mitigating a gap in construction activity at those shipyards. Further, as a lesson learned from the LCS Program, the Navy and Fincantieri have partnered in certain facility improvements to improve construction efficiency for the FFG Program. Finally, expansion and diversification of the vendor base has proven a valuable lesson as we seek to strengthen the supply chain, improving resiliency.

Ms. OAKLEY. The Navy has testified numerous times that it learned its lessons from prior programs, including the Littoral Combat Ship (LCS) and *Zumwalt*-class Destroyer (DDG 1000) programs. However, the Navy's recent performance on the *Constellation*-class Frigate and Medium Landing Ship programs are too similar to its prior performance in the LCS and DDG 1000 programs to presume that the Navy has learned the lessons from its prior shipbuilding efforts and has implemented corrective fixes. For example, both programs' performance to date reflect that decisions were made based on a weak business case—the balance of technologies, design knowledge, funding, and time needed to deliver a product. These programs have experienced significant schedule delays and cost increases during the early stages of program development or production resulting from several factors, including a weak business case.

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[1] Basic and function design include the following tasks: designing the ship steel structure and setting hydrodynamics; designing safety systems; routing all major distributive systems throughout the ship; gathering information on position of piping, ventilation, equipment, and other outfitting in each block; and 3D modeling the ship structure and major systems; among other details.

7. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, given that modifying an existing parent design has proven more difficult than expected, would the Navy have been better off pursuing a clean-sheet design instead?

Dr. SEIDLE and Vice Admiral DOWNEY. Modifying a parent ship design to meet US Navy survivability and lethality requirements comes with challenges. There is, therefore, some benefit in starting out with a clean-sheet design. One benefit is that the Navy can land on a design that is in accordance with requirements without the need for modifications, which could have a cascading effect throughout the system of systems. That said, clean-sheet design comes with challenges that make it cost or schedule prohibitive in some instances. Knowing this, the acquisition strategy supported the concept of adapting a parent design for the benefits of cost and schedule expedience. An important lesson learned is that the Navy and its shipbuilding partners must work together in open and transparent fashion in order to facilitate an acceptable design as efficiently as possible. It is through communications, relationships, and pragmatic decisionmaking that we have seen the recent progress in FFG design efforts.

Ms. OAKLEY. While the Navy has faced challenges modifying an existing design to meet Navy requirements, it is difficult to ascertain whether pursuing a clean-sheet design would have yielded better program performance. Reliance on a parent design—and the finite scope of tailoring that it afforded—helped the Navy constrain its appetite for the new technologies that the frigate could introduce to the fleet. While the Navy's execution of the parent design approach may have been flawed in this case, in pursuing a clean-sheet design, the Navy could have made similar high-risk acquisition decisions based on a weak business case, as evidenced by prior ship designs that started with clean sheets. Instead, it is important to understand the missteps the Navy took once it selected the parent design for the new frigate. For example, our May 2024 report on the Navy's frigate program highlighted that the Navy significantly modified the parent design after it had awarded a detail, design and construction contract, which undercut its approach to leverage an existing design to minimize technical risk. This approach contrasts with how commercial shipbuilders design and build ships. Commercial shipbuilders isolate changes when building a new ship design to maximize the value of using an existing design as their foundation for new ship designs. This approach helps preserve design maturity and reduces total work required for new ship designs.

8. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, the lead ship, FFG–62, was originally scheduled for delivery in 2026, but delays suggest it may not enter service on time. What are the current projected delivery dates for the lead ship and follow-on hulls?

Dr. SEIDLE and Vice Admiral DOWNEY. Projected delivery dates for the awarded *Constellation*-class Frigates are as follows:

USS *Constellation* (FFG 62) – April 2029

USS *Congress* (FFG 63) – January 2030

USS *Chesapeake* (FFG 64) – January 2031

USS *LaFayette* (FFG 65) – January 2032

USS *Hamilton* (FFG 66) – January 2033

USS *Galvez* (FFG 67) – September 2033

Ms. OAKLEY. The Navy now projects to deliver the lead frigate in April 2029 and has yet to set delivery dates for follow-on ships. However, achieving this date relies on the Navy and shipbuilder stabilizing the design in the near term. The program office expects to achieve a stable basic and functional design by late spring 2025. However, the program has yet to achieve its planned rate of design progress to meet this goal. Last, the shipbuilder must ensure it has an adequate workforce to support planned production schedules once production ramps up in order to achieve planned delivery dates for the lead and follow-on ships.

9. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, the original per-unit cost estimate for the *Constellation*-class was approximately $1 billion per hull, but the recent congressional Research Service (CRS) report and Navy assessments indicate potential cost growth. What are the updated cost projections for the lead ship and future frigates?

Dr. SEIDLE and Vice Admiral DOWNEY. The cost of each ship is constrained by the ceiling price of the contract, representing the Government's cost risk. The current constrained estimated cost of the lead ship (FFG 62), along with the Government-furnished combat system, is approximately $1.4 billion, compared to the Navy's

original estimate of $1.2 billion. The current constrained estimated cost of the second ship (FFG 63) is approximately $1.1 billion.

Ms. OAKLEY. Our current estimate, which is based on December 2023 data, reflects a per-unit cost of $1.15 billion per hull. However, based on current contractor performance, estimated costs for delivering the lead frigate has risen above the contract ceiling price; $310 million in cost growth across multiple ships on key government furnished equipment that was funded in 2023; and five requests for equitable adjustment under review between the Navy and shipbuilder, as of November 2024, it is likely that the Navy will exceed the original per-unit cost estimate. Any future cost increases will likely be reflected in Cost to Complete funding requests in future budget submissions. Further, the Navy is unlikely to accurately estimate new per-unit costs until it completes the lead ship design and stabilizes the ship's ongoing weight growth.

STRATEGIC APPROACH TO SHIPBUILDING

10. Senator HIRONO. Ms. Oakley, the Government Acquisition Office (GAO) report titled "Shipbuilding and Repair: Navy Needs a Strategic Approach for Private Sector Industrial Base Investments" highlights the Navy's struggle to meet its shipbuilding goals due to limitations in the private sector industrial base. Specifically, challenges like inadequate infrastructure and workforce shortages continue to hinder progress. A long-term strategic approach is needed to address these gaps and improve effectiveness in shipbuilding and maintenance. What specific measures is the Navy taking to address the infrastructure limitations in the private sector industrial base and ensure it can meet current and future shipbuilding demands?

Ms. OAKLEY. DOD has spent over $5.8 billion since fiscal year 2014 on support for the shipbuilding industrial base, which includes funding for shipbuilder and supplier infrastructure investments. For example, this funding includes $1.83 billion in Navy contract incentives for private investment that shipbuilding companies earned between fiscal years 2014 and 2023. These incentives were primarily in Special Capital Expenditures and Construction Readiness Incentives, which are investment incentives that are typically used to encourage the shipbuilders to make corporate investments in infrastructure and facilities. Funds under these incentives are available to the shipbuilder only if it agrees to make a Navy-approved shipyard investment.

The Navy plans to provide additional support to shipbuilder infrastructure in the coming years. In addition to at least $1.5 billion in additional investment incentives already on contract that the shipbuilder could earn, the Navy's fiscal year 2025 budget request included $733 million for shipbuilder infrastructure as part of its submarine industrial base funding request. In addition, the proposed reconciliation bill could provide additional industrial base funding.

In addition to funding shipbuilder infrastructure investments, the Navy has also supported investments in the supplier base. Since 2018, the Navy reported receiving more than $2.6 billion to invest in the submarine supplier base and help achieve *Columbia*-class construction goals. Some of this supplier funding has been used to purchase new equipment—like cranes—and improve supplier facilities, among other things. As of December 2023, the *Columbia*-class submarine program reported that 193 suppliers had received supplier development funding awards.

DOD also provides funding that supports shipbuilding and supplier infrastructure, such as through Defense Production Act Title III funding.

11. Senator HIRONO. Dr. Seidle, how does the Navy plan to align its investments in the private shipbuilding sector with its long-term goals to increase fleet size and improve the readiness of its ships?

Dr. SEIDLE. The Navy is continually assessing private sector capacity and capability with its forecasted requirements and ensuring alignment of investments and initiatives to support future shipbuilding and maintenance requirements. The Navy is leveraging its Maritime Industrial Base (MIB) Program, which is leading enterprise efforts to help restore America's shipbuilding capacity, executing significant Navy investment to strengthen and expand the shipbuilding industrial base required to meet a generational increase in demand for shipbuilding. The MIB Program's efforts are focused on six key areas: growing capability and capacity in the supply chain; modernizing shipbuilder infrastructure; expanding capacity of key suppliers to take on work traditionally executed by shipbuilders; developing the critical maritime manufacturing workforce; operationalizing advanced manufacturing technology; and improving government oversight.

12. Senator HIRONO. Dr. Seidle, what steps is the Department of Defense taking to evaluate and improve the effectiveness of its funding in supporting the industrial base, especially in terms of long-term sustainability and workforce development?

Dr. SEIDLE. The Navy has implemented a data-driven and data-informed process to ensure our investments and initiatives are targeting the primary enablers of shipbuilding and ship sustainment schedules. As part of this process, we assess and track impacts of Navy industrial base investment at multiple levels across our key lines of effort: supplier development; shipbuilder infrastructure; strategic outsourcing; workforce development; and advanced manufacturing technology.

At the individual project level, the Navy implements discrete, measurable return on investment metrics for each project with a mandated feedback loop to measure progress. At the aggregate level, we assess multiple individual projects with shared objectives. For example, we assess how numerous individual initiatives focused on workforce training and placement contribute to overall workforce objectives. Finally, at the portfolio level, we assess projects and aggregate-level impacts relative to production schedule drivers, such as on-time and in-full delivery of submarine components.

The Navy's data-based assessment and decisionmaking process for industrial base investment enables a standard approach to assessing impact and identifying challenges and opportunities, improving coordination, and integrating perspectives among a range of stakeholders. This approach enables us to assess performance against current shipbuilding demand, in addition to projected future demand as the industrial base scales to meet that growing demand, to ensure we are working to achieve gains that are sustainable. Collectively, these efforts support flexible decisionmaking to meet a dynamic supply chain environment.

FUTURE FLEET DESIGN AND ACQUISITION STRATEGIES

13. Senator HIRONO. Dr. Seidle, the Navy's current fleet acquisition strategy is not optimized for long-term efficiency, and alternative approaches, such as modular construction, increased automation, and different fleet compositions, could help address cost and schedule risks. What alternative shipbuilding strategies is the Navy exploring to improve efficiency, such as modular construction or changes to fleet composition?

Dr. SEIDLE. The Navy is working with other agencies across the Government to review shipbuilding strategies as a whole, as part of the efforts associated with the recent Executive Order, "Restoring America's Maritime Dominance." These efforts are ongoing, and we look forward to opportunities to improve our shipbuilding program performance.

Additionally, the Navy is continuing to support shipbuilder efforts to pursue strategic outsourcing by shifting some workload to other shipbuilders and key suppliers to enable long-term sustainable growth in capacity. This approach supports delivery of the ships and submarines we must have, while leveraging existing capacity throughout the country. These efforts include the innovative partnership with private capital and industry to create the United Submarine Alliance Fund and its subsequent purchase of shipbuilding industry land in Mobile, Alabama.

14. Senator HIRONO. Dr. Seidle, how is the Navy incorporating new technologies and best practices to reduce shipbuilding time and cost while maintaining capabilities?

Dr. SEIDLE. To remain competitive and ensure our Nation has the capacity to build ships at scale, our industrial base must quickly adopt advanced manufacturing technologies such as automation, robotics, additive manufacturing, artificial intelligence, and generative scheduling to maximize productivity and efficiency.

Driving advanced manufacturing at scale into the supply base and operationalizing technologies like additive manufacturing (AM) as an interchangeable manufacturing process are critical focus areas for the Navy to reduce maintenance delays and new construction schedules, alleviate chokepoints in key marketspaces, and help mitigate the demand for manufacturing workforce.

The Navy's investments in advanced technology, such as the AM Center of Excellence (CoE), are already helping get our ships back to sea, with more than 15 examples where the AM CoE has printed parts for ships and submarines in response to emergent needs. For example, the AM CoE printed a replacement for a damaged helicopter hanger door bracket for USS *Halsey* (DDG 97) in just 19 days, while acquiring the part via the stock system would take 40 weeks.

Similarly, the Navy is investing in efforts to implement and scale advanced technologies like robotics, automation, artificial intelligence, and machine learning to

streamline production workflows, improve efficiency, and support the next generation workforce.

ADDRESSING NAVY COST ESTIMATION GAPS

15. Senator HIRONO. Ms. Oakley, persistent underestimation of shipbuilding costs often leads to major budget overruns once construction begins. These miscalculations have impacted multiple programs over the past decade. How is the Navy working to improve its cost estimation process to provide more accurate projections for Congress?

Ms. OAKLEY. We have not been requested to conduct the work necessary to answer this question. However, our work has highlighted the importance of the Navy addressing this challenge to be able to realistically achieve the fleet growth that it wants. We have found that the Navy historically sets extensive and detailed requirements for new vessels many years before these vessels are fielded. It locks in major commitments to construct ships before design stability is achieved. These actions have led to unrealistic cost and schedule expectations. In turn, these unmet expectations disturb the Navy's funding plans, driving the department to redirect resources intended to pay for other needs and resulting in unfunded capabilities.

16. Senator HIRONO. Ms. Oakley, is the Navy considering independent cost assessments for major programs to ensure greater transparency and accountability?

Ms. OAKLEY. The Navy used to have its own independent cost assessment office. However, this group was disbanded over 5 years ago. Navy program offices use a centralized resource to conduct cost estimates, but they use assumptions as approved by the program office. To the best of our knowledge, the Navy is not considering reinstating this office.

We have consistently found that the Navy's cost estimates are optimistic. Navy practices for estimating costs and for contracting and budgeting for ships have resulted in unrealistic funding of programs and when unexpected events occur, tracking mechanisms are slow to pick them up. Tools exist to manage the challenges inherent in shipbuilding, including measuring the probability of cost growth when estimating costs; making full use of design knowledge to inform realistic cost, schedule, and performance attributes; and tracking and providing timely reporting on program costs to alert managers to potential problems. However, we have repeatedly found for 20 years that the Navy does not effectively employ tools to mitigate cost risk.

For example, in 2019 we found that the Navy's $115 billion procurement cost estimate for the Columbia Class program is not reliable partly because it is based on overly optimistic assumptions about the labor hours needed to construct the submarines. While the Navy analyzed cost risks, it did not include margin in its estimate for likely cost overruns. The Navy told us it would continue to update its lead submarine cost estimate. As we reported in 2019, an independent assessment of the estimate would not be complete in time to inform the Navy's 2021 budget request to Congress to purchase the lead submarine. Without these reviews, we determined the cost estimate—and, consequently, the budget—were likely unrealistic. A reliable cost estimate is especially important for a program of this size and complexity to help ensure that its budget is sufficient to execute the program as planned.

ADDRESSING WORKFORCE SHORTAGES

17. Senator HIRONO. Vice Admiral Downey, several reports highlight significant workforce shortages across the U.S. shipbuilding industrial base, particularly in skilled labor necessary for both new ship construction and maintenance of existing fleets. Without addressing this issue, we risk continued delays and increased costs in delivering much-needed vessels. What specific actions is the Navy taking to recruit, train, and retain a skilled workforce to support shipbuilding and maintenance efforts?

Vice Admiral DOWNEY. Encouraging young Americans to seek careers in the skilled trades requires the collective efforts of Federal, State, and local governments, as well as our industry partners. Next-generation workforce members must see a viable career path that is adequately compensated, has clear purpose, and provides opportunities to advance. We must fundamentally change how we view skilled trades—they must be seen as a critical component of our national security, and the Navy team is actively working to elevate those conversations at a national level through messaging and partnership.

The Navy has made significant investment to attract, recruit, train, and retain the maritime industrial-base workforce. Our attraction and recruitment campaigns are raising awareness of career opportunities in the maritime sector, and inspiring

the next-generation of "new collar" workers. Since September 2023, nearly 19 million people have visited Buildsubmarines.com, 2.8 million applications have been submitted via the career portal, and our K–12 engagement efforts have reached more than 25,000 students.

The Navy's six regional talent pipeline programs have placed more than 6,700 workers in maritime industrial base careers, while partnering with small and medium suppliers to implement best practices to improve retention. In January 2025, the Accelerated Training in Defense Manufacturing (ATDM) program in Danville, Virginia, opened its National Training Center, which will graduate 1,000 students per year in key maritime trades like welding, additive manufacturing, advanced machining, quality assurance, and non-destructive testing.

Navy funding is also supporting "Quality of Life" improvements at the shipyards, such as a new childcare facility at Bath Iron Works. What we know is that all these areas must be addressed—K–12, career and technical education/university, incumbent workforce, and the ecosystem improvements to ensure people want to stay.

18. Senator HIRONO. Vice Admiral Downey, how does the Navy plan to work with Congress, industry, and educational institutions to develop a pipeline of trained workers, particularly in critical fields like welding and engineering?

Vice Admiral DOWNEY. The Navy has made significant investment to attract, recruit, train, and retain the maritime industrial-base workforce. We have partnered with government and private organizations across key regions in an "all hands on deck" effort, launching more than 150 workforce-development initiatives since fiscal year (FY) 2023.

The Navy has established six regional Talent Pipeline Programstalent pipelines, which forge connections between small and medium suppliers, trade schools and training programs, and workforce candidates, to meet the hiring demand for the maritime industrial base. The pipelines have placed more than 6,700 trade workers in the maritime sector and partnered with nearly 400 suppliers. In January 2025, the ATDM program in Danville, Virginia, opened its National Training Center, which will graduate 1,000 students per year in key maritime trades like welding, additive manufacturing, advanced machining, quality assurance, and non-destructive testing. The Navy is also partnering with universities across the country to support demand for engineering workforce.

With the Navy's investments and strong participation from partners across the country, the submarine industrial base hired 12,600 new workers in 2024, nearly a 200-percent increase since 2021 and approaching the 14,500 annual demand for submarine construction.

MANAGING COST OVERRUNS AND SCHEDULE DELAYS

19. Senator HIRONO. Dr. Seidle, inflation, design maturity challenges, and contracting inefficiencies have led to cost overruns and schedule delays across key Navy programs, including the *Constellation*-class frigate. These delays directly impact our fleet readiness and long-term force structure planning. What lessons has the Navy learned from past programs to improve cost estimation and avoid the recurring issue of unrealistic procurement estimates?

Dr. SEIDLE. The Navy's cost estimation methods involve models that are ever evolving as more is learned. Variables within the model include shipbuilder past performance, lessons learned, inflation, and ship requirements such as size and complexity. Some factors that may have significant impact to ship cost are difficult to predict, such as a natural disaster, pandemic, or certain macroeconomic events. The Navy continues to refine cost estimating models and methods and perform uncertainty analysis to better predict, or account for, the uncertain cost drivers, continually improving cost estimates.

20. Senator HIRONO. Dr. Seidle, how does the Navy plan to increase accountability within shipbuilding contracts to ensure on-time and on-budget deliveries?

Dr. SEIDLE. The Navy fully agrees with the need to be responsible stewards of the taxpayer's money as we ensure we build the Navy we need. This is critical to fielding our fleet. I am aware of the acute focus by both the Secretary of Defense and the Secretary of the Navy on the acquisition process and, specifically, holding both ourselves and our industry partners accountable to the American people in equipping our Navy to perform its mission set.

To ensure we can hold private companies accountable for failure to perform, we must commit to establishing clear requirements and minimizing post award requirements changes. After contract award, we must continue to utilize all available mechanisms at our disposal such as critical, but honest feedback in the Contractor Per-

formance Assessment Reporting System (CPARS), awarding follow-on contracts and exercising options only when the Government has sufficient confidence in contractor performance, withholding of financing when appropriate, and, if necessary, termination of the contract to ensure we are holding the industrial base accountable for timely and affordable delivery of goods and services.

STRENGTHENING THE SHIPBUILDING INDUSTRIAL BASE

21. Senator HIRONO. Dr. Seidle, the shipbuilding industrial base is struggling with capacity constraints. Strengthening the industrial base is essential to meeting national security objectives. What targeted investments does the Navy plan to make to expand the capacity of both private and public shipyards?

Dr. SEIDLE. Since 2018, more than $10 billion has been appropriated to address submarine industrial base capability, capacity, and workforce with an additional $1.3 billion appropriated to support surface ship industrial base efforts. The Navy Maritime Industrial Base (MIB) Program Office is leading enterprise wide efforts to help restore America's shipbuilding capacity in a strategy focused on six key lines of effort: growing capability and capacity in the supply chain, modernizing shipbuilder infrastructure, expanding capacity of key suppliers to take on work traditionally executed by shipbuilders, developing the critical maritime manufacturing workforce, operationalizing advanced manufacturing technology, and improving government oversight.

Navy investments have helped to grow submarine industrial base capacity by 250 percent, with investments underway expected to add an additional 40 percent. We are making targeted investments to address chokepoints in the supply chain, with more than $1 billion invested to date to improve on-time delivery of components that are build sequence-critical for nuclear shipbuilding programs. Navy investments are also helping improve capacity and modernize infrastructure of new-construction private shipyards, as well as address supply chain capacity constraints by leveraging advanced manufacturing technology.

At our public shipyards, the Navy is currently investing in the Shipyard Infrastructure Optimization Program (SIOP) to provide the modernized facilities needed to maintain the current and future fleet. SIOP is delivering infrastructure and industrial plant equipment, expanding shipyard capacity, and optimizing shipyard configuration to meet the Navy's nuclear-powered aircraft carrier and submarine maintenance requirements and return these critical platforms to sea faster.

22. Senator HIRONO. Dr. Seidle, how is the Navy leveraging partnerships with allied shipbuilders and best practices from foreign shipbuilding industries to improve efficiency and productivity in U.S. shipyards?

Dr. SEIDLE. The Navy is closely engaged with our allies to understand their approaches to shipbuilding and how we can leverage best practices to improve efficiency and productivity. For example, the Navy is working to identify opportunities to leverage some of the approaches that Japan and South Korea use in their shipbuilding sector, such as standardized ship design, modular production techniques, advanced manufacturing technology, and strong public-private partnerships.

Additionally, opportunities for targeted strategic foreign investment into the domestic shipbuilding industrial base offers opportunities for leveraging successful practices, lessons learned, and technological advances that could positively impact Government shipbuilding program outcomes and help to rebuild the domestic commercial shipbuilding industrial base. Any investments are carefully reviewed and well understood in advance of approval given the strategic importance of the domestic shipbuilding industrial base.

The Navy continues to review opportunities to strategically partner further with its allies and partners to improve shipbuilding outcomes, meet Navy battle force requirements, and identify opportunities to redefine the Nation's approach to military shipbuilding.

SUPPLY CHAIN DISRUPTIONS AND MATERIAL SHORTAGES

23. Senator HIRONO. Vice Admiral Downey, former SECNAV Del Toro's review and CRS report on shipbuilding highlight supply chain vulnerabilities, particularly in securing key components like propulsion systems and combat systems. These disruptions are further exacerbating shipbuilding delays and increasing costs. What actions is the Navy taking to stabilize the shipbuilding supply chain and ensure timely access to critical materials?

Vice Admiral DOWNEY. The Navy is focused on improving the capability, capacity, and resiliency of our supply chain. Since fiscal year 2018, the Navy has funded over 725 supplier development projects to add capability, capacity, and resiliency to the

supply chain, including development of alternate suppliers for critical submarine components. This includes investments with more than 50 single/sole-source suppliers to address supply chain fragility, including establishing and qualifying alternate sources of supply in key areas like castings, raw materials, valves and fittings, and mechanical components. In addition, the Navy has invested $1 billion to date to improve on-time delivery of components that are build sequence-critical for nuclear shipbuilding programs.

The Navy is also addressing supply chain vulnerability by leveraging advanced manufacturing technology such as automation, robotics, additive manufacturing (AM), artificial intelligence, and generative scheduling. Driving advanced manufacturing at scale into the supply base and operationalizing technologies like AM as an interchangeable manufacturing process is a critical focus area for the Navy to reduce maintenance delays and new construction schedules, alleviate chokepoints in key market spaces such as castings and forgings, and help mitigate the demand for manufacturing workforce.

24. Senator HIRONO. Vice Admiral Downey, what can be done to help mitigate supply chain risks and improve resiliency in ship component production?

Vice Admiral DOWNEY. The Navy is focused on improving the capability, capacity, and resiliency of our supply chain. Since fiscal year 2018, the Navy has funded over 725 supplier development projects to add capability, capacity, and resiliency to the supply chain, including development of alternate suppliers for critical submarine components. This includes investments with more than 50 single/sole-source suppliers to address supply chain fragility, including establishing and qualifying alternate sources of supply in key areas like castings, raw materials, valves and fittings, and mechanical components. In addition, the Navy has invested $1 billion to date to improve on-time delivery of components that are build sequence-critical for nuclear shipbuilding programs.

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MULTIYEAR PROCUREMENT AND BLOCK BUYS

25. Senator HIRONO. Dr. Seidle, multiyear procurement (MYP) and block-buy contracting could help stabilize shipbuilding programs, lower costs, and provide greater predictability for the industrial base. What programs are currently being considered for MYP or block-buy contracting, and what are the expected cost savings from these approaches?

Dr. SEIDLE. The Navy actively utilizes MYP and block-buy contracting strategies to enhance program stability, reduce costs, and provide greater predictability for both the industrial base and the workforce. These strategies also support the retention of a skilled workforce and ensure necessary investments in the supply chain by providing a longer-term planning horizon.

Currently, the following shipbuilding programs are either utilizing or are being considered for MYP or block-buy contracting strategies: *Virginia*-class submarines, *Columbia*-class submarines, DDG–51 *Arleigh Burke*-class destroyers, *John Lewis*-class (TAO–205) fleet replenishment oilers, Amphibious Multi-Ship Procurement (one *America*-class amphibious assault ship (LHA) and three *San Antonio*-class amphibious transport dock (LPD) ships).

In addition to shipbuilding, the Navy also applies MYP and block-buy contracting strategies to aviation and other programs, including the CH–53K heavy lift helicopter and various munition programs. MYP and block buys remain instrumental to meeting force structure goals affordably while ensuring the readiness and timely delivery of critical platforms. The Navy appreciates continued congressional support for these authorities.

26. Senator HIRONO. Dr. Seidle, how can Congress better support these long-term procurement strategies to enhance fleet sustainment and shipbuilding efficiency?

Dr. SEIDLE. Compared to the standard approach of annual contracting, multiyear procurement (MYP) and block buy contracting (BBC) have the potential for lowering procurement costs and providing higher level of stability for the industrial base. MYP and BBC are special contracting mechanisms that Congress permits the De-

partment of Defense (DoD) to use for a limited number of defense acquisition programs. The Navy encourages Congress to continue to authorize the DOD to utilize these special contracting mechanisms. The firm prospect of future business results in cost reductions by allowing the contractor to optimize its workforce and production facilities and make economic ordering quantity purchases of long-lead components.

FEDERAL WORKFORCE REDUCTION

27. Senator HIRONO. Ms. Oakley, the Department of Government Efficiency (DOGE) has initiated significant reductions in the Federal workforce. These cuts are poised to impact various Federal agencies, including those overseeing shipyards crucial to our national defense infrastructure. Notably, Pearl Harbor Naval Shipyard (PHNSY) serves as a cornerstone of Hawaii's defense infrastructure and economy. As the State's largest industrial employer, it provides substantial economic benefits to the region. Union leaders across several public shipyards have expressed concerns that these workforce reductions could severely hinder their shipyard's capacity to meet Navy project demands. How does the Navy anticipate that reductions in the Federal workforce, particularly within agencies overseeing shipyards, will affect national security and the timely execution of defense projects?

Ms. OAKLEY. We have reported extensively on defense maintenance taking months or years longer than expected, in part, due to shortages in skilled personnel. For example:

- In August 2020, we reported that workforce factors, such as having enough people to perform the work, was one of the main factors causing maintenance delays for aircraft carriers and submarines. The workforce factor contributed to more than 4,000 days of maintenance delay on aircraft carriers and submarines during fiscal years 2015 through 2019. In response to our recommendations, the Navy has taken action to update workforce planning requirements.
- In December 2018, we reported that, because it takes 5 years or more to become proficient in some occupations, DOD must systematically plan and prepare to hire, train and retain the workforce it needs to support its vital maintenance and repair mission. When this does not happen, maintenance for weapons systems could be delayed by shortages in skilled personnel. For example, at Pearl Harbor Naval Shipyard, two submarines were delayed approximately 23 and 20 months past their scheduled maintenance dates, in part, as a result of shortages in ship fitters and welders, among others. We recommended that the Navy assess the effectiveness of the Navy's shipyards' and fleet readiness centers' hiring, training, and retention programs, which the Navy implemented.
- In November 2018, we reported that the Navy had started to address workforce shortages and facilities needs at the public shipyards. These efforts to address the Navy's maintenance challenges are important steps, but they will require several years of sustained management attention to reach fruition. The number of civilian full-time employees at the shipyards increased from 25,087 in 2007 to 34,160 in 2017, with a goal to reach 36,100 by 2020.

To meet requirements for maintaining its ships in the fleet, the Navy is undertaking an effort to re-capitalize its public shipyards. We have ongoing work related to the Navy's Shipyard Infrastructure Optimization Program (SIOP) at the four public Naval shipyards. This will address, among other things, the extent to which Navy oversight of SIOP includes processes for identifying, mitigating, and communicating program risks—including workforce challenges—to inform decisionmaking. We expect to issue a report early in 2026.

28. Senator HIRONO. Ms. Oakley, while certain shipyard employees have been exempted from hiring freezes, what criteria are used to determine these exemptions, and how does the Navy plan to ensure that essential positions remain filled to support shipyard operations?

Ms. OAKLEY. We have not been requested to conduct the work necessary to answer this question. While we are aware of the current hiring freeze, we do not have information regarding the Navy's plans for staffing positions. However, we are aware that in a February 28, 2025, the Secretary of Defense exempted public shipyard employees from the hiring freeze. The memo further stated that DOD will only hire mission-essential employees into positions that directly contribute to warfighting readiness.

AMPHIBIOUS SHIPS

29. Senator HIRONO. Vice Admiral Downey, amphibious warships, such as the *San Antonio*-class (LPD), *America*-class (LHA), and older *Whidbey Island*/*Harpers Ferry*-class (LSD) vessels, are critical for Marine Corps expeditionary operations, humanitarian missions, and power projection. What are the primary challenges facing the construction of new amphibious ships, such as the LPD Flight II and LHA-class vessels?

Vice Admiral DOWNEY. The primary challenges facing construction of new amphibious ships at Huntington Ingalls Industries are a downward shift of average labor experience (i.e. increased "green labor") and challenges in hiring-and-retention to meet manning level targets. The single source nature of amphibious ships to one shipyard in one geographical location increase the difficulty in mitigating these challenges.

30. Senator HIRONO. Vice Admiral Downey, how does the Navy plan to address shipyard capacity limitations and supply chain shortages that are delaying amphibious ship production?

Vice Admiral DOWNEY. The Navy is continually assessing private sector capacity and capability with its forecast requirements and ensuring alignment of investments and initiatives to support future shipbuilding and maintenance requirements. The Navy is also supporting shipbuilder pursuit of strategic outsourcing by shifting some workload to other shipbuilders, including small shipyards and key suppliers, leveraging existing capacity throughout the country to enable long-term sustainable growth in capacity to deliver the ships and submarines the Navy requires. The Navy and Gulf Coast shipbuilders are actively investing in workforce retention programs, including mentorship initiatives and enhanced training, to improve stability and reduce production delays. These efforts aim to create a more skilled and engaged workforce that will improve shipyard productivity and reduce delays. The Navy will continue to make critical investments to grow the capability, capacity and workforce of key suppliers around the country to enable shipbuilding.

31. Senator HIRONO. Vice Admiral Downey, given cost overruns and schedule delays across multiple shipbuilding programs, what measures is the Navy taking to control costs in the amphibious ship fleet?

Vice Admiral DOWNEY. The Navy has taken the following actions to control costs for amphibious ships: (1) using fixed-price incentive fees and firm-target contracts for ship construction, where the Navy and shipbuilder share the risk of cost overruns, (2) using common configuration baselines for sequential ship awards by minimizing change between flight upgrades, and (3) awarding a multi-ship (LPD 33–35 & LHA 10) amphibious procurement contract to enable proven cost-avoidance tools, such as economic order of quantity, for component sourcing and stabilization of demand for our shipbuilder and industrial supply base.

32. Senator HIRONO. Vice Admiral Downey, how does the Navy's long-term shipbuilding plan align with the Marine Corps' requirements for amphibious warfare and littoral operations?

Vice Admiral DOWNEY. The Navy's long-term shipbuilding plan is aligned with the Marine Corps' requirements for amphibious warfare and littoral operations, focusing on enhancing mobility, flexibility and readiness in contested environments. Central to this alignment is the commitment to maintain a minimum of 31 amphibious warships—comprising of 10 Landing Helicopter Assaults and 21 Landing Platform Docks—as mandated by Congress, ensuring the Marine Corps has the necessary platforms for rapid deployment and sustained operations. Additionally, the Navy plans to procure Medium Landing ships to support the Marine Corps' vision for distributed operations and littoral maneuver, particularly in the Indo-Pacific theater. These efforts are complemented by multi-ship procurement strategies aimed at cost savings and industrial base stability, as well as initiatives to address maintenance backlogs and improve the material condition of the existing amphibious fleet, thereby enhancing overall operational readiness.

To further strengthen our commitment, the Navy is placing significant emphasis on maintenance to ensure that the existing amphibious fleet remains fully capable of meeting the Marine Corps' requirements for rapid deployment and sustained operations. This includes addressing maintenance backlogs, modernizing older platforms, and improving the overall material condition of amphibious warships. By enhancing the fleet's readiness and extending the life of these vital assets, we are ensuring that the Navy and Marine Corps are well-equipped to operate in the challenging and dynamic environments of amphibious warfare and littoral operations.

CHINA AND SHIPBUILDING

33. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, in April 2024, The Office of the U.S. Trade Representative (USTR) initiated an investigation into efforts by China to dominate in the maritime, logistics, and shipbuilding sectors. Following its report, it determined in January 2025 that China's targeting of the maritime, logistics, and shipbuilding sectors for dominance displaces foreign firms, deprives market-oriented businesses and their workers of commercial opportunities, and lessens competition efforts thus creating a "burden or restrict[ing]" United States commerce, and are therefore "actionable" under Title III of the Trade Act, which is one of the principal statutory means by which the United States enforces U.S. rights under trade agreements and addresses "unfair" foreign barriers to U.S. exports. How does China's dominance in global shipbuilding impact the United States Navy's ability to maintain and expand its fleet?

Dr. SEIDLE and Vice Admiral DOWNEY. China's dominance in global shipbuilding, while not directly impacting the Navy's domestic shipbuilding and maintenance, presents potential risks to future expansion and competitiveness. At face value, China's cost and production advantages have no direct impacts on these companies' support to the Navy. However, China's massive production scale fuels rapid technological advancement, potentially surpassing United States capabilities in maritime areas. More critically, China's influence extends to crucial supply chains that provide raw materials and minerals required for sustainment and production of Navy capabilities. The domestic industrial base and the ability to rapidly procure critical components are undermined by Beijing's efforts to halt, delay, or degrade access to critical minerals. By addressing and discouraging predatory trade practices that threaten the long-term competitiveness of domestic maritime activities, the U.S. Trade Representative's report and potential actions under Title III of the Trade Act could indirectly contribute to a more robust U.S. maritime ecosystem.

Ms. OAKLEY. We have not been requested to conduct the work necessary to answer this question.

34. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, what vulnerabilities does the U.S. face due to its reliance on foreign-built commercial vessels for sealift and logistics support?

Dr. SEIDLE and Vice Admiral DOWNEY. The U.S. reliance on foreign-built commercial vessels is currently limited to the Ready Reserve Force (RRF) recapitalization program. Under the RRF recapitalization program, RRF sealift vessels are recapitalized through procurement of existing vessels in the commercial marketplace. The vessels procured to date under the RRF recapitalization program include seven foreign-built vessels, which were eligible for procurement due to lack of available U.S.-built vessels. Vulnerabilities associated with the procurement of existing vessels, whether foreign or U.S.-built, include:

- Availability of suitable replacements within allocated budgets
- Age and material condition of replacements
- Market price and availability fluctuation/instability
- Extent and cost of vessel reflagging, reclassification, and modifications necessary to achieve required capability
- Lifecycle maintenance and support challenges associated with foreign-sourced suppliers and logistics
- Procurement delays and impacts on RRF readiness associated with the above factors.

Ms. OAKLEY. We have not been requested to do work to assess DOD's reliance on foreign-built commercial vessels for sealift and logistics support. However, in 2017, we previously reported that sealift and combat logistics fleet readiness decreased since 2012—including incidents of degraded or out-of-service equipment had increased over a 5-year period. At the time, the Navy has started to develop a long-term plan to address recapitalization of the aging surge sealift fleet, but the plan had not been finalized. We recommended the Navy incorporate leading practices for capital planning in a comprehensive sealift recapitalization plan and assess the effects of widely distributed operations on the combat logistics force. The Navy implemented both recommendations.

In September 2024, we issued a CUI report on DOD's reliance on contractors providing fuel delivery and storage in the Indo-Pacific Command. We can provide a copy of this report upon request or it is available from House security staff.

35. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, what steps is the Navy taking to ensure supply chain security for critical ship components that are currently dominated by People's Republic of China (PRC) manufacturers, such as propulsion systems and ship-to-shore cranes?

Dr. SEIDLE and Vice Admiral DOWNEY. China's dominance in global commercial shipbuilding presents potential risks to future United States expansion and competitiveness. Their investment in maritime infrastructure has been extensive and culminated in a virtual monopoly on global shipping containers and ship-to-shore cranes as well as Chinese ownership stakes at 95 ports in 53 countries—including the United States. Fortunately, our most advanced vessels and our nuclear fleet rely on US technology and manufacturing for critical propulsion systems. While there is some reliance on international markets and critical minerals for standard propulsion, we recognize that a strong supply chain is the foundation for a strong Navy and we have concentrated efforts to illuminate risks, map their impact, and engage the industrial base to develop mitigation strategies. The Navy is taking and will continue to take action by applying proactive risk management strategies and leveraging illumination tools to identify and target high-risk Original Equipment Manufacturer (OEM)/market spaces for strategic supply chain engagement, performing targeted foreign investment screening to ensure our critical technologies remain free from adversarial capital practices, and strengthening our relationships with critical suppliers. By securing our supply chains, the Navy is committed to delivering a steady stream of advanced warfighting capabilities to maintain maritime dominance.

Ms. OAKLEY. We have not been requested to do work to answer this question in whole. However, GAO has an ongoing review assessing the country of origin of DOD items and components, including foreign dependency and supply chain risks, in response to a mandate included in the conference report to the National Defense Authorization Act for Fiscal Year 2024 that we expect to issue later this year.

36. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, how is the Navy planning to maintain and sustain unmanned ships with conventional surface repair shipyard capacity already constrained by today's manned fleet?

Dr. SEIDLE and Vice Admiral DOWNEY. Integrating and maintaining a growing fleet of unmanned surface vessels (USVs) presents a significant challenge for already busy shipyards. The Navy is exploring multiple strategies to achieve USV readiness, but success hinges on overcoming maintenance and sustainment hurdles. This requires innovative solutions, long-term planning, and improved shipyard workflows, including streamlined procedures and potential prioritization of USV maintenance during less busy periods.

The Navy plans to procure commercial standard USVs with high levels of reliability, automation, and modularity with specific focus on reducing the frequency and complexity of maintenance. Modular design and commercial standards will support rapid component swapping, increase the ability to repair vessels with mobile repair teams, reduce load on major shipyards, and allow the Navy to leverage commercial shipyards. The Navy plans to partner with private shipyards to supplement maintenance capacity; this includes providing training and support to private companies to help equip them to handle USV maintenance. The Navy recently sourced four prototype MUSV platforms that can be maintained in smaller scale facilities that have ship or boat repair agreements with the Navy. This augments commercial repair capacity for surface combatants.

Ms. OAKLEY. The Navy contracts with private companies to repair surface ships. In February 2025, we found that the ship repair private sector industrial base has struggled to meet the Navy's goals for on-time completion of ship repair periods due to key infrastructure and workforce challenges. The private sector ship repair industrial base generally has enough capacity to support the Navy's planned surface ship repair work in the near term. However, this industrial base does not always have the capacity to support maintenance plan changes, such as growth work, emergency repairs, or wartime needs due to limited infrastructure and workforce capacity. For example, the Navy estimates that its planned repair workload could exceed ship repair companies' workforce capacity in three fleet concentration areas—San Diego, California; Mayport, Florida; and Pearl Harbor, Hawaii—at some times through fiscal year 2031 if workforce capacity does not change from current levels. Adding uncrewed vessels to this workload could further exacerbate these challenges.

We have identified several factors that hindered the Navy's ability to address these challenges. For example, the Navy has not developed a strategy to guide management of the ship industrial base. Our prior work has shown that a consolidated and comprehensive strategy enables decisionmakers to better guide program efforts and assess results. Without an overall strategy, the Navy has struggled to provide

industry with a stable workload projection, which has hindered industry efforts to invest in needed infrastructure. Developing a ship industrial base strategy would help the Navy align and assess its actions to manage the industrial base for shipbuilding and repair. We made six recommendations in February 2025 to DOD to improve its management of investments in the private sector shipbuilding and repair industrial base, including that the Navy create a ship industrial base strategy. DOD generally agreed with the recommendations.

37. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, what facilities, workforce, and resource allocation will surface fleet maintenance need as the fleet changes and the hybrid fleet future arrives?

Dr. SEIDLE and Vice Admiral DOWNEY. Adding additional unmanned ships to the fleet threatens to complicate an already busy shipyard industry. However, by ensuring unmanned systems are built to commercial standards, with modular and highly reliable designs, the Navy can both increase the number of shipyards capable of executing repairs and reduce the complexity and duration of those repairs. This offers a chance to save the major shipyards for the complex maintenance required for manned combatants, while smaller commercial yards can provide the agility and capacity needed to support the future force.

Ms. OAKLEY. Related to the hybrid fleet, there is a gap in small and medium unmanned surface vessels that could be built in non-tier one yards but the Navy has not budgeted for these systems in earnest to date. The Navy's 30-year shipbuilding plan highlights that these ships are essential to augmenting traditional battle force ships. However, the Navy has consistently not supported these programs in the budget as requirements and costs for battle force ship programs increase and take up a large portion of the budget. DOD has tried to address this issue by providing funding for Replicator. However, Replicator is focused on small attritable systems only. All robotic autonomous systems will require sustainment, logistics, training and operators. We have previously found that the Navy has poorly planned to sustain its assets during the acquisition process, which creates costly and significant problems during operations. We further discuss these challenges in a recently released SECRET-NOFORN report on Robotic Autonomous Systems that is available from House security staff.

EMERGING TECHNOLOGY AND OPPORTUNITIES

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40. Senator HIRONO. Dr. Seidle, Vice Admiral Downey, and Ms. Oakley, shipbuilding acquisition and research and development dollars are tied to legacy, conventional programs like the guided missile destroyer (DDG) and guided missile frigate (FFG). These programs are critical, but if all money is tied to them, future programs will never get attention from Navy personnel and contracts attention they need to develop. For example, Navy Manufacturing Tech (MANTECH) dollars today can only go to major programs like frigates and aircraft carriers, while private companies are building new manufacturing capacity and new processes. Processes that the Navy cannot validate and invest in with contracts because money is tied to legacy shipbuilding programs. How can the Navy invest in shipbuilding for the future surface fleet?

Dr. SEIDLE and Vice Admiral DOWNEY. As an example of how RDT&E funds are used to invest in our future surface fleet, our Future Destroyer Program, DDG(X), is utilizing those funds to mitigate technical and design risk through extensive distributed land-based testing. This testing supports design and architecture decisions as well as serves to mitigate risk by discovering issues and determining corrective actions or alternate solutions. Further, these efforts help codify partnerships with non-traditional and non-government entities as the early design analysis is performed. These partnerships include Florida State University, University of Texas at Arlington, as well as with the Defense Innovation Unit (DIU). Finally, the Navy is partnered with Huntington Ingalls Industries as well as General Dynamics-Bath Iron Works as a collaborative design application is being developed, allowing two shipbuilding companies to work collaboratively on a single ship design, as well as allowing the shipbuilders to influence the design for producibility, thereby making future construction of those ships more efficient.

Ms. OAKLEY. We reported in February 2025 that the Navy has some potential options for using additional U.S. shipbuilders to construct its battle force ships. For

example, representatives from a shipbuilder we visited that generally constructs Coast Guard ships and conducts other commercial work told us that they would be interested in pursuing contracts for larger Navy ships. Other U.S. shipbuilders that construct ships for the U.S. Coast Guard, Military Sealift Command, and commercial buyers could also pursue Navy work. However, the number of additional domestic shipbuilders is limited.

The Navy's fiscal year 2025 shipbuilding plan states that the limited availability of companies to compete for shipbuilding contracts has contributed to progressively higher costs to the government, greater fragility of the workforce, and reduced incentives for the private sector to invest in infrastructure. The plan also describes a new initiative in which the Navy plans to attract new market entrants and restore competition to the U.S. shipbuilding industry—referred to by the Navy as the Maritime Statecraft initiative. The plan describes this as a long-term initiative that would enable the Navy to deliver more ships on time and at a lower cost. Increasing the number of companies that can compete for Navy contracts could aid the Navy's goal of quickly increasing the size of the fleet. However, while the Navy has an interest in increasing opportunities for competition, it also wants to preserve the financial health of its existing shipbuilders so that they remain part of the industrial base for future shipbuilding programs. As the Navy seeks to provide competitive opportunities for future classes of ships, it will need to determine how to navigate these competing priorities. As such, we recommended that the Navy develop a strategy to guide its approach to the industrial base.

Smaller shipyards may also have opportunities to take on additional work as subcontractors to ongoing shipbuilding programs. Most of the shipbuilders that the Navy currently uses for its major shipbuilding programs are giving consideration to outsourcing to suppliers to alleviate constraints at their shipyards, such as aging infrastructure and limited physical space. Such outsourcing could result in work for the Navy's ongoing shipbuilding programs being conducted at smaller shipyards. However, as we have previously reported, quality assurance oversight of outsourced materials will be critical to avoiding delays that could be caused by quality problems.

Last, there is a gap in small and medium unmanned surface vessels that could be built in non-tier one yards but the Navy has not funded these systems in earnest to date. The Navy's 30-year shipbuilding plan highlights that these ships are essential to augmenting traditional battle force ships. However, the Navy has consistently not supported these programs with funding as requirements and costs for battle force ship programs increase and take up a large portion of the budget. DOD has tried to address this issue by providing funding for Replicator. However, Replicator is focused on small attritable systems only. We further discuss these challenges in a recently released SECRET-NOFORN report on Robotic Autonomous Systems that is available from House security staff.