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UNITED STATES SENATE

HEARING TO RECEIVE TESTIMONY ON THE PROCUREMENT, ACQUISITION, TESTING, AND OVERSIGHT OF THE NAVY'S GERALD R. FORD-CLASS AIRCRAFT CARRIER PROGRAM

Thursday, October 1, 2015

Washington, D.C.

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U.S. Senate
Committee on Armed Services
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The committee met, pursuant to notice, at 9:31 a.m. in Room SD-G50, Dirksen Senate Office Building, Hon. John McCain, chairman of the committee, presiding.

Committee Members Present: Senators McCain [presiding], Wicker, Ayotte, Fischer, Cotton, Rounds, Ernst, Tillis, Sullivan, Reed, McCaskill, Manchin, Gillibrand, Donnelly, Hirono, Kaine, and King.

OPENING STATEMENT OF HON. JOHN McCAIN, U.S. SENATOR FROM ARIZONA

Chairman McCain: Good morning.

For more than seven decades, the aircraft carrier has been the centerpiece of America's global power projection. We rely on our carrier fleet to defend our interests, our values, and our allies around the world, a mission that is more important than ever today as global threats multiply from Gulf to the western Pacific to the north Atlantic.

For 13 years, the Department of Defense has sought to develop our newest aircraft carrier, the U.S.S. Gerald R. Ford, marking the beginning of an entire new class of this ship. The Ford-class aircraft carrier program is one of our Nation's most complex and most expensive defense acquisition projects. It's also become, unfortunately, one of the most spectacular acquisition debacles in recent memory. And that's saying something. The Ford-class program is currently estimated to be more than $6 billion over budget. Despite the recent announcement of a 2-month delay, the first ship is scheduled for delivery next year. The second ship, however, is 5 years behind schedule. Significant questions still remain about the capability and reliability of the core systems of these aircraft carriers. And yet, when I asked the former Chief of Naval Operations who's responsible for the cost overrun on the U.S.S. Gerald R.

Ford, he said he didn't know.

This committee has been actively involved with this program from the very start. And, since the beginning of this year, our oversight has increased significantly. At the direction of Senator Reed and myself, committee staff have conducted a thorough investigation of the Ford-class program. This work has entailed the request and review of thousands of pages of work plans, proprietary documents, contracting information, correspondence, and operational testing data, as well as numerous interviews with key players from the Office of the Secretary of Defense, the Navy, and the industry. This work has been done on a bipartisan basis, in keeping with the best traditions of this committee.

As a result, we meet today with clear goals: to examine what has gone wrong with this program, to identify who is accountable, to assess what these failures mean for the future of our aircraft carrier fleet and Navy shipbuilding, and to determine whether any reforms to our defense acquisition system could prevent these failures from ever happening again.

To help us answer these questions today are the key civilian and military officials who are responsible for developing, procuring, testing, and overseeing the Ford-class program. The Honorable Katrina McFarland, Assistant

Secretary of Defense for Acquisition, is the principal advisor to the Secretary of Defense and Under Secretary of Defense for Acquisition, Technology, and Logistics on matters relating to acquisition. The Honorable Sean Stackley, Assistant Secretary of the Navy for Research, Development, and Acquisition, is the Navy's acquisition executive responsible for the research, development, and acquisition of Navy and Marine Corps systems. Rear Admiral Michael Manazir, who is Director of Air Warfare on the Navy staff, is responsible for Navy -- naval aviation requirements. Rear Admiral Thomas Moore, Program Executive Officer for Aircraft Carriers, is responsible for aircraft carrier acquisition. Rear Admiral Donald Gaddis, Program Executive Officer for Tactical Aircraft, is responsible for naval tactical aircraft acquisition programs, including aircraft launch and recovery equipment. The Honorable J. Michael Gilmore, Director of Operational Test and Evaluation, is the senior advisor to the Secretary of Defense for operational and live-fire test and evaluation of weapon systems. And Mr. Paul Francis, Managing Director of Acquisition and Sourcing Management at the Government Accountability Office, whose 40-year career with GAO is focused mostly on major weapons acquisitions, especially shipbuilding.

We thank each of our distinguished witnesses, and thank

them for joining us today.

In 2002, Secretary Donald Rumsfeld, the Office of the Secretary of Defense, and the Navy conceived of the U.S.S. Gerald Ford -- Gerald R. Ford, or CVN-78, as a, quote, "transformational weapon system." They decided to develop concurrently and integrate onto one ship all at once a host of advanced and entirely unproven technologies, including a new nuclear reactor plant, a new electrical distribution system, a new enlarged flight deck, a new dual-band radar, a new electromagnetic catapult system to launch aircraft, and new advanced arresting gear to recover them. This was the original sin, in my view, that so damaged this program.

Since 2008, the estimated procurement cost for CVN-78 has grown by $2.4 billion, or 23 percent, for a total cost of $12.9 billion. The story of the U.S.S. John F. Kennedy, or CVN-79, could be worse, because the Department of Defense began building it before proving the new systems on CVN-78 and while continuing to make major changes to the CVN-79, including a new radar. This has made CVN-79, in essence, a second lead ship, with all of the associated problems. Its estimated cost has risen to $11.5 billion, a $2.3-billion, or 25-percent, increase, and the ship has been delayed 5 years, to 2024.

Much of the cost growth and scheduled delays for the ship itself have been due to problems with its major

components which the Navy has been developing separately. These systems, especially those that launch and recover aircraft, have faced their own significant cost growth and schedule delays, and they still are not ready. For example, the advanced arresting gear, or AAG, was built as a more efficient and effective way to recover a wider variety of aircraft on the carrier deck. However, AAG's development costs have more than quadrupled, and it is expected to make -- to take twice as long as originally estimated, 15 years in total, to complete. As a result, if CVN-78 goes to sea as planned in 2016, it will do so without the capability to recover all of the types of aircraft that would land on the ship. Furthermore, the cost and schedule programs with AAG have so driven up its per-unit cost that the Navy will be unable to upgrade on our older Nimitz-class carriers with this new system as originally planned. This means that, by the 2030s, many of our naval aircraft may be able to land on just a few of our carriers.

The Ford-class program is actually symptomatic of a larger problem, the dysfunction of our defense acquisition system as a whole. A decade of oversight reporting show that CVN-78 has been plagued by the same problems found throughout Navy shipbuilding, and indeed, most major defense acquisition programs: unrealistic business cases, poor cost estimates, new systems rushed to production, concurrent

design and construction, and problems testing systems to demonstrate promised capability. All of these problems have been made worse by the absence of competition in aircraft carrier construction.

What's more, the Ford-class program exemplifies the misalignment of accountability and responsibility in our defense acquisition system. To my knowledge, not a single person has ever been accountable -- held accountable for the failures of this program. That is due, in no small part, to diffusion of authority across multiple offices and program managers. These blurred lines of accountability allow the leaders of our defense acquisition system to evade responsibility for results. Everyone is responsible, so no one is responsible.

While the Navy and the contractors deserve much of the blame, the milestone decision authority for the Ford-class program rests with the Office of the Secretary of Defense, specifically the Under Secretary of Defense for Acquisition, Technology, and Logistics. AT&L is responsible for determining whether a program has a sound business case and for approving the start of development and production. The Navy can be faulted for excessive optimism and deficient realism. But, AT&L was neither complacent -- was either complacent or complicit. Indeed, AT&L authorized the Navy to start construction of CVN-78 when only 27 percent of the

ship was designed and just 5 of its 13 new systems were mature. Despite 10 years of warnings from its own independent cost estimators and weapons testers, as well as the GAO, AT&L failed to make timely and effective course corrections.

And lest anyone think that Congress is above reproach, we are not. While congressional oversight has helped to control the cost and improve the program, we could have intervened more forcefully and demanded more from the Department of Defense. And we did not.

Ultimately, all of us need to internalize the lessons of this program. I am encouraged that the Navy appears to be doing so in their efforts to stabilize the program and change their approach to contracting for CVN-79.

This year's National Defense Authorization Act also contains several provisions that increase oversight of the Ford-class program, streamline authority, accountability, and responsibility in our defense acquisition system. But, perhaps the lesson I would most stress is this. We cannot afford another acquisition failure like the Ford-class aircraft carrier, especially in the current fiscal environment. We simply cannot afford to pay $12.9 billion for a single ship. And if these costs are not controlled, we must be willing to pursue alternatives that can deliver similar capability to our warfighters on time and on budget.

We must be willing to question whether we need to go back to building smaller, cheaper aircraft carriers that could bring new competitors into this market. We might even have to consider rebalancing our long-range strike portfolio with fewer carriers and more land-based or precision-guided weapons. If we can't do better, everything must be on the table. And so long as I am Chairman, it will.

I thank the witnesses and look forward to their testimony.

[A series of charts follow:]

[COMMITTEE INSERT]

Chairman McCain: Senator Reed.

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

Senator Reed: Well, thank you very much, Mr. Chairman. Let me commend you for calling this extremely important hearing, and not only calling the hearing, but for your attention to this issue over many, many years, and your advice and your insistence that we pay close attention to this program, and other programs, too.

The Gerald Ford-class aircraft carrier program has been plagued by delays and cost overruns since its inception over a decade ago, and today's hearing will focus on many of the problems that we've seen during the execution of the program.

Some of these delays and inefficiencies are the responsibility of the shipbuilder, who has been operating on a cost-plus incentive-fee type of contract and has been slow to apply modern building techniques that the shipbuilder is using in other programs, such as the Virginia-class program.

Some of the problems stem from including new technologies that were not sufficiently matured into the design of the ship. These immature technologies included systems that are critical for successful operation of the aircraft carrier: the advanced arresting gear, the electromagnetic aircraft launch system, and the dual-band radar. Each of these systems have posed schedule challenges

and is millions of dollars over budget.

While we recognize that designing and building an aircraft carrier is a difficult and costly enterprise, the committee is concerned that some of these problems were foreseeable and should have been resolved years ago. But, I believe there's a larger issue woven into this drama. If we look back at the inception of the program, the Navy was facing the inevitable retirement of the U.S.S. Enterprise, CVN-65, which was scheduled to run out of fuel about 2013 or 2014. This pressurized a schedule for starting the first ship in the CVN-21 program, which evolved into what would become the next aircraft carrier, the Gerald R. Ford. The CVN-21 program was intended to evolve technologies over a two-ship program, CVNX-1 and CVNX-2, and install new systems when they had achieved sufficient maturity to warrant inclusion. While that might not have been a perfect -- the two-step approach -- the two-step plan was more in keeping with the spiral acquisition approach favored by the Weapon Systems Acquisition Reform Act of 2009. However, in late 2002, the Navy was directed, as Senator McCain indicated, by the Secretary of Defense to pursue a program that was more transformational. This involved incorporating all of the new technologies on the first ship, which caused DOD to make risky choices in the aircraft carrier program. And we are living with the results of those choices now in the delayed

deliveries and increased cost.

The Navy is not blameless in this process, either. The Navy shares blame for failing to lay out potential off-ramps for risky technologies that did not mature in time to meet the underlying schedule. I believe the Navy could have done this even within the parameters of transformation. While such off-ramps may not have prevented all the problems we have faced, it would have had -- at least given us better options when we had unpleasant discoveries during the development phase.

The Navy and the contractors share blame for starting construction of ship before sufficient work had been completed on the design of the ship. And history has shown that this inevitably leads to inefficient production, schedule delays, and cost increase.

Finally, Congress shares responsibility for having approved the Department of Defense approach to acquiring these aircraft carriers. The only change to the program that Congress insisted upon was instituting a legislative cost cap on the three ships in the program. And, while I think this cost gap has brought some better discipline to the program, it's not prevented cost and schedule problems.

I look forward hearing from these witnesses on this important program about changes that have been made and can be made in the future to prevent the cost and schedule

overruns that we see today.

And, once again, thank you, Mr. Chairman, for your leadership.

Chairman McCain: I thank the witnesses. And we will hear opening witness statements from Secretary McFarland, Secretary Stackley, Dr. Gilmore, and Mr. Francis, and then we will proceed with questions.

We will begin with you, Secretary McFarland. Welcome.

STATEMENT OF HON. KATRINA G. McFARLAND, ASSISTANT SECRETARY OF DEFENSE (ACQUISITION), DEPARTMENT OF DEFENSE

Ms. McFarland: Chairman McCain, Ranking Member Reed, and distinguished members of this committee, I appreciate the opportunity to appear today to testify about procurement, acquisition, testing, and oversight of the Navy's CVN-78 Gerald R. Ford-class aircraft carrier program.

I ask that my prepared statement be taken and submitted for the record.

Chairman McCain: Without objection. All statements will be included.

Ms. McFarland: Thank you.

The CVX program was initiated in 1996. Its development and procurement timelines have spanned numerous administrations and multiple changes in acquisition policy, as the Chairman and the Ranking Member noted. The program has been subject of many -- multiple program reviews looking to reduce costs and achieve efficiencies that have redirected the acquisition approach or technical baseline.

As with all the Department's programs, the CVN-78 has had to compete for the resources in the President's budget review. And, while each change in policy, acquisition approach, or technical baseline was made in the best interests of the warfighter, the Department, and the taxpayer in mind, the cumulative effect of these changes has

resulted in program instability.

Since 2010, and coincident with the introduction of the Department's better buying power initiatives, this program has been largely stabilized. While technical challenges remain, the Under Secretary of Defense for Acquisition, Technology, and Logistics continues to work with the Navy to tailor the program and ensure appropriate oversight at both the Navy staff level as well as OSD.

We've established an excellent relationship with the Navy and worked together to change processes and policies that have impacted the ability of the program to succeed, to include revitalizing the acquisition workforce and the skills of them -- of whom we represent here, several thousand men and women who lead our Nation's shipbuilding acquisition.

The timeline and complexities associated with the construction of aircraft carriers are enormous and sensitive to a wide range of technological, economic, policy, and business factors, many of which cannot be predicted in time to be readily mitigated. Nevertheless, we are committed to applying the resources needed to keep control of aircraft carrier program costs and schedules for the CVN-78, -79, and all that follow, and deliver these carriers to meet the needs of the warfighter.

Again, thank you for the opportunity to appear today.

And I look forward to your questions.

[The prepared statement of Ms. McFarland follows:]

Chairman McCain: Secretary Stackley.

STATEMENT OF HON. SEAN J. STACKLEY, ASSISTANT SECRETARY, RESEARCH, DEVELOPMENT, AND ACQUISITION, DEPARTMENT OF THE NAVY; ACCOMPANIED BY REAR ADMIRAL DONALD E. GADDIS, USN, PROGRAM EXECUTIVE OFFICER, TACTICAL AIRCRAFT, DEPARTMENT OF THE NAVY, AND REAR ADMIRAL THOMAS J. MOORE, USN, PROGRAM EXECUTIVE OFFICER, AIRCRAFT CARRIERS, DEPARTMENT OF THE NAVY, AND REAR ADMIRAL MICHAEL C. MANAZIR, USN, DIRECTOR, AIR WARFARE (OPNAV)

Mr. Stackley: Mr. Chairman, Ranking Member Reed, members of the committee, thank you for the opportunity to appear today to discuss the CVN-78 carrier program.

This committee, and no one more than you, Mr. Chairman, fully understands the role of the carrier as an instrument of American diplomacy, power projection, and global security. George Will summed it well in his column just yesterday, "The Navy's operations on which the sun never sets are the Nation's nerve endings connecting it with a turbulent world, for though the next President may be elected without addressing the Navy's size and configuration, for 4 years he or she will be acutely aware of where the carriers are."

The newest of these carriers will be the Gerald R. Ford, CVN-78, the Nation's first new carrier design since the Nimitz was authorized by Congress in 1967. The Ford itself will be in service for 50 years in a three-ship class

until almost 2080. It is, therefore, imperative, as this committee has so clearly impressed upon the Department and reemphasizes here today, that our future carrier force have the capability necessary to defeat the future threat, but, two, that it does so at a cost that the Nation can bear.

Designing, building, manning, operating, and maintaining these incredibly complex ships is beyond any other nation's undertaking. Those members who have visited the Ford under construction fully appreciate the daunting numbers that measure her: tens of thousands of tons of structure, thousands of miles of cable and fiber optics, hundreds of miles of pipe, thousands of compartments, hundreds of ship systems, tens of thousands of sensors integrated to drive greater than 1,000 megawatt of nuclear power across the globe throughout its life. It is a remarkable demonstration of what American industry is able to achieve, and it is a quantum increase in capability for our warfighter, capability required by our Navy in the century ahead.

To be clear, however, this program has had significant challenges resulting in unacceptable cost growth. And to understand the cause of this cost growth, it's important to understand the carrier's history.

As the Nimitz approached mid-life, requirements were drafted to modernize future carriers to a traditional serial

evolution of technology development, ship design, and construction. A total of 23 new capabilities were to be incrementally introduced across three ships, commencing with CVN-77, at a pace consistent with the maturity of the related technologies. These development capabilities would provide a 33-percent increase in the rate at which aircraft are launched and recovered, a propulsion plant providing three times the electrical generating capacity and 25 percent more energy than Nimitz, increased service life allowances to enable future modernization, increase survivability, including improvements to the combat system, firefighting systems, weapons handling, and basic hull design, and, importantly, a $4 billion reduction per ship in total ownership cost over the ship's 50-year life. Technology development was initiated for the electromagnetic aircraft launching system, or EMALS, the advanced arresting gear, or AAG, and the advanced weapons elevators. Modernization of weapons, sensors, and communications systems would be accomplished by incorporating new capabilities developed, or being developed, by other programs, including the DDG-1000's state-of-the-art dual-band radar. A new power distribution, advanced degalcing system, and automated control systems would be incorporated to improve survivability. A new reactor plant, propulsion and machinery control systems would be developed to meet

power requirements. The carrier's superstructure, or island, would be redesigned to accommodate the new electronics systems and to enable improved flight-deck operations. And all of these upgrades would contribute to a total manpower reduction of 1200 sailors.

As the Chairman has pointed out, in 2002 with priority placed on transformation by the Secretary of Defense, DOD changed course such that the three-ship incremental modernization would be accomplished in a single step on a single ship, CVN-78. This decision resulted in what has proven to be a critically high degree of concurrent development, design, material procurement, and construction. Costs were estimated, and design and construction proceeded with inadequate information regarding the complexity of the new systems and with inadequate risk factors to account for the high degree of concurrency, ultimately impacting cost and performance in each phase of development, design, build, and test of CVN-78.

Today, design is effectively complete, and production is near 95 percent complete, and we are focused on completing the test program and delivering the lead ship. Actions put in place from 2009 through 2011 have been effective in halting the early cost growth on CVN-78, including converting the design from a level of effort to a completion contract with a firm target and incentive fee,

placing contract design changes under strict control, reducing fee consistent with contract provisions, yet incentivizing improvements upon current cost performance, removing overly burdensome specifications that impose unnecessary cost, contracting and competing alternative sources of supply to mitigate the significant impact of material delays, raising completion levels at each stage of construction to improve production efficiencies. Meanwhile, following a detailed Nunn-McCurdy-like review in 2009, the Navy converted the EMALS and AAG contract to a firm fixed-price contract for production to cap cost on each of those systems. And the shipbuilder subjected its build process to review by competitor shipyards in order to identify fundamental changes necessary to improve their performance.

Finally, management changes were instituted and coupled with increased readiness reviews focused on cost performance and critical path issues to ensure we're doing all that can be done to improve cost performance.

I personally conduct reviews on no less than a quarterly basis, often monthly, and have assigned, for these past 4-plus years, Rear Admiral Moore, the Navy officer with the single greatest experience across carrier operations, construction, and program management, as the program executive officer. And, importantly, while we confront the impacts of concurrency on CVN-78, we've made essential

changes to eliminate these causes for cost growth and to further improve performance on CVN-79 and -80. As reported to Congress in May of 2013, requirements for CVN-70 are locked down, the design model is complete, and 80 percent of initial drawings released. New technologies on CVN-78 are virtually mature on CVN-79. Material is being ordered efficiently and on schedule. The shipbuilder has leveraged lessons learned, incorporated produceability improvements, made significant investments to modernize tooling and facilities, and has implemented build sequence changes to drive down production cost. And the Navy is implementing a two-phase delivery plan to allow the basic ship to be constructed and tested in the most efficient manner by the shipbuilder while enabling select ship systems and compartments to be completed in a second phase where the work can be competed, accomplished more effectively, and use of skilled installation teams.

The net result of all these actions was the recent award of CVN-79 as a fixed-price construction contract that, in conjunction with GFE, government furnished equipment, procures CVN-79 at or below the congressional cost cap. We're on target on CVN-79 and will continue to reduce the costs of future ships of the class.

Mr. Chairman, you've raised questions regarding accountability. I am accountable for the decisions I make

about this ship or any Navy/Marine Corps program for which I am the service acquisition executive. But, this simple statement doesn't adequately address your concern. The current system is challenged to align responsibility, accountability, and decision-making for large, complex projects that take years to develop and deliver. This program, in particular, has spanned four Secretaries of the Navy, six Chiefs of Naval Operations, four naval acquisition executives, six defense acquisition executives, four program executive officers, four program managers, and eight Congresses. Gaps, seams, and course changes and decisions have been critical.

The decision to pursue a transformational approach driving three incrementally enhanced ships into one was made for what was believed to be the right decision at that time. As the acquisition executive, what can be done to stabilize the cost on CVN-78 and pursue cost-performance improvements on the remainder of the class, I believe is being done. We have much further to go in this regard, but I believe we are on the right path.

Going forward, under the Secretary's direction, the CNO, the Commandant, and I are changing the way we do business within the Department of the Navy to achieve much greater clarity of authority, traceability to cost, visibility to performance, and therefore, accountability for

cost and schedule on our major programs. We hope to have the opportunity to share these details with you and your staff.

In sum, your Navy is committed to providing our sailors with the capability they need to perform their missions around the world, around the clock, every single day of the year. And we strive every day to do this in a way that enhances affordability while ensuring we maintain a robust industrial base to hedge against an uncertain future.

We look forward to answering your questions, sir.

[The prepared statement of Mr. Stackley follows:]

Chairman McCain: Thank you.

Dr. Gilmore.

STATEMENT OF HON. J. MICHAEL GILMORE, DIRECTOR OF OPERATIONAL TEST AND EVALUATION, DEPARTMENT OF DEFENSE

Dr. Gilmore: Mr. Chairman, Senator Reed, members of the committee, I'll briefly summarize my written statement.

Whether the projected quantum improvements and combat effectiveness and reductions in total ownership costs that will be realized that are associated with the new systems being incorporated in CVN-78 are not now known, the Navy indicates the reliability of the electromagnetic aircraft launch system, or EMALS, advanced arresting gear, AAG, and dual-band radar, DBR, will support initial operational test and evaluation in first deployment.

The most recent definitive data I have indicate the reliability of EMALS is below the Navy's goal by more than a factor of ten. The reliability of the DBR and redesigned AAG are unknown. We only have engineering estimates or reliability, very little test data.

Prior to its redesign, AAG reliability was a factor of 800 below its goal. Data providing a first indication of the reliability of the redesigned AAG will be available later this year as a result of ongoing testing.

In the case of EMALS, the Navy notes that reliability is above the December 2014 reliability growth curve. However, as a consequence of poor performance and tests, that growth curve was rebaselined to well below the

reliability goal, and, consequently, the data we have indicate EMALS was not on a path to meet its goal.

What the effects on combat effectiveness of shortfalls, if any, in the ultimate reliability of these systems could be will not be known until developmental and operational tests that are conducting post-delivery. In particular, the specific nature of the failures encountered and their difficulty of repair will be important to understand. In that regard, the Navy has recently indicated that the EMALS installation on CVN-78 is such that failures in selected EMALS components could result in multiple catapults being down for extended periods. This is because there is no ability to read -- to readily electrically isolate components permitting, as in current fleet operations, maintenance on nonoperating catapults while flight operations are performed on operating catapults. The reliability of these systems will also be a key determinant of whether projected life-cycle cost savings for the Ford-class will actually be realized.

The schedule of activities for CVN-78 subsequent to its delivery, including the timing for and number of independent steaming exercises, is determined primarily by the Navy's certification, safety, and training requirements. Operational testing and strike combat operations, which cannot be accomplished until carrier air wing qualifications

are complete, will be conducted as part of the Ford's joint task force exercise, which is an integral part of the Navy's planned training evolution for the ship and her crew. The plan is to test systems realistically as early as possible, to provide feedback to the program office, and to combine training and testing. Nonetheless, the current test schedule remains, in my view, aggressive, with concurrent ship-based and land-based developmental testing, and with some developmental testing, including very important first-time integration testing, continuing past the start of operational testing.

In August, the Deputy Secretary of Defense directed the Navy to conduct a full-ship shock trial on CVN-78 before the ship's first deployment. Historical experience indicates clearly this is a key means to identify and mitigate mission-critical failures before the ship and her crew deploy into harm's way.

Finally, CVN-78 was designed to reduce manning, thereby limiting total ownership costs. However, recent Navy assessments raise concerns about manning issues on CVN-78 that would only be exacerbated by any shortfalls realized in the reliability of EMALS, AAG, and DBR. In particular, the Navy's manning wargame 3 states front-end analyses have not been finalized to capture the true maintenance and operational workload associated with the carrier's new and

unique systems, and that won't be possible until we know more about what the reliability will actually be and what their maintainability will actually be.

Thank you.

[The prepared statement of Dr. Gilmore follows:]

Chairman McCain: Mr. Francis.

STATEMENT OF PAUL L. FRANCIS, MANAGING DIRECTOR OF ACQUISITION AND SOURCING MANAGEMENT, U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Mr. Francis: Thank you, Mr. Chairman, Mr. Reed, members of the committee. And I appreciate the opportunity to talk about the carrier program this morning.

Let me start with the CVN-78. My bottom line on the CVN-78 is "same story, different program." In 2007, we reported that costs were likely to be underestimated by 22 percent on the construction of the ship and that the three main technologies -- EMALS, AAG, and DBR -- were immature, likely to slip to the right, and out of schedule margin. And we said the Navy would be faced with the decision to either push the ship to the right or push the technologies to the right.

Fast forward to today, 2015, cost increases are 22 percent. The three key technologies -- I'm going to hold the slide up -- but, they've slipped about 5 years. So, the decisions made to keep the ship construction schedule pretty much intact but let the technologies slip. So, that's probably hard to see. But, the top chart -- we have circles here. Three, four, five, and six, those are the three key technologies in the beginning of the shipboard testing. So, the original plan on the top was clearly "fly before buy." Where we are today is, those three technologies and

shipboard testing have all slid past ship launch. So, that's "buy before fly."

So, my view at this point is, ship costs are going to continue to increase, full capability of the ship has been deferred, and right now we're looking at getting less for more. Now, why would I say that? I remember 25 years ago, I was interviewing the second Under Secretary of Defense for AT&L, John Betti. And he told me, "You know, cost estimates in the Department of Defense, it's not like they're impossible to be achieved, but they do count on hitting seven home runs in the bottom of the ninth." So, I apologize for the sports analogy, but it's not mine.

So, let's look at the home runs that the CVN-78 has to hit. And you can kind of see them bunched up here. We have to do a land-based testing, ship-based testing, integrated testing, IOT&E, all the time we're trying to complete construction. So, it's a big lift.

Let's go to the CVN-79. What are its home runs? Right now the CVN-79's cost estimate depends on reducing construction labor hours by 18 percent, 9.3 million labor hours. Never been done before. Twice of whatever's been done in the past. The dual-band radar has been removed. It'll be replaced with a radar that's to be determined. And upgrades that were planned for the ship have been postponed. And so, I think that's wringing a lot out of the program

already. It's already, with all these changes, at cap, and we're 7 years from delivery. Again, I think cost increases are likely, regardless of what's reported against the cost cap.

So, I'd like to put the carrier in a little context here against acquisition. And, I think, Mr. Chairman, you brought this up, as did Mr. Reed. The CVN-78 program is a typical acquisition outcome. You know, 22-percent increase in cost, schedule delays are actually pretty typical for acquisitions. And, Mr. Chairman, I've testified before you a number of times on different things, but we can think of worse examples: JSF, FSC, F-22, LCS. So, I think what's different here is, this program -- we knew all along this was going to be the case. We shouldn't be surprised by anything that's happened here, because we saw it coming. So, it's not an "I told you so" moment. It's "We all knew it."

And so, you ask yourself why does something like this happen? Best practices are pretty well known, and we can go through them. So, mature technologies before you put them on the program. Wasn't done here. Go with a realistic cost estimate, and budget to it. We've always gone with the lowest cost estimate, the Navy's estimate. And we still are. And "fly before buy." It wasn't done here.

So, you ask yourself, Why don't we do these things?

And my belief is, it's the prevailing acquisition culture. It's the collective pressures that the different participants bring upon the process that create incentives for programs to overstate what they think they can do, to understate technical risk, to understate cost, and to understate schedule. That's how you get funding, that's how you get programs approved.

So, I'd just like to say, Where does this leave us today? And I'll say I know it's popular today to talk about the acquisition process being broken, but I think it's in a happy equilibrium. Well, maybe not so happy, but it's in equilibrium. It's been this way for 50 years. And I think it's going to stay this way until the incentives change. And, as the Chairman said, I've had -- been in this job for 40 years. I haven't given up hope yet. And I believe that Congress is the game-changer here. I think Congress can change the incentives by reclaiming its oversight role, which I think has been diminished over the years. So, what do I mean by that? I'll cite three things:

First is, your most important oversight tool is the initial funding you provide to a program. But, you give that tool up pretty early. So, if I'm a program today and I'm at milestone B, Congress had to approve my funding 2 years ago. Information was less, optimism fills the void. There's a cardinal rule in acquisition that says, "Don't

take money off the table." So, once you've approved my funding, 2 years later you've actually made the milestone B decision for me.

Second thing is, I know the committee has many, many heavy responsibilities, but one of your responsibilities is, you're the appeals court for the services. So, if OSD says something a service disagrees with -- and I'm speaking broadly -- if Mike Gilmore's shop says something that the -- they don't agree with, if the CAPE estimate they don't like, if it's a GAO recommendation they don't like, the services come up here. You're the appeals court. And they try to strike a deal. And they get those deals.

And then, finally, a movement in the Department -- and, I think, particularly with the Navy -- is the bundle-up programs in multiyear procurements, block buys, and option program -- or option contracts. So, not only do you give up your funding -- initial funding power, you can't touch the program afterwards, because it's all locked down in a block contract.

So, I guess my appeal to you today is, let's not think of the CVN-78 program as the story, per se, but let's think about it as an object lesson in acquisition process and acquisition culture, and what the Congress can do about it, not just telling what the Department can do, but how you might do differently. Because I really think what you do

with money sends messages as to what is acceptable.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Francis follows:]

Chairman McCain: Well, thank you, Mr. Francis.

Have you seen some of the changes we've made in acquisition in the defense bill that we passed through the Senate?

Mr. Francis: I have, Mr. Chairman.

Chairman McCain: Is those steps in the right direction?

Mr. Francis: I think they're in the right direction, in many cases, for the Department, but I think, as you said in your opening statement, to the extent the Department comes in with a bad business case, if you still approve it and fund it, you're sanctioning it. So, with all of those improvements in acquisition reform legislation, that has to be coupled with what you do on programs. And I think a couple of good "noes" would be healthy.

Chairman McCain: I think Senator Reed and I realize that we're just beginning in acquisition reform. And we will continue to make it our highest priority.

Secretary McFarland or Secretary Stackley, is there anything you disagree with that Mr. Francis said?

Mr. Stackley: Mr. Chairman, I was paying close attention and taking notes, and if I were changing places with Paul, looking at this from his perspective, I think I'd write a very similar summary, with some edits that I don't want to quibble over right here. But, I think his summation

of some of the systemic issues, I think they are -- I think he is correct, on spot. And what I would suggest is that we are making some systemic changes on our side, and you, likewise, with the Congress, to try to address these issues. And I don't give up on them.

Chairman McCain: Secretary McFarland?

Ms. McFarland: Chairman, Ranking Member, I agree with much of what Paul said. In fact, I haven't spent 40 years, but I've been spending at least 30-plus years being both a program manager and a tester in most of the functions that are performed inside of acquisition. And the challenge is the culture, and it is the people. It's the workforce, itself. I think the Department is very grateful for other committee and for the Congress for providing defense acquisition workforce development funds to help. But, inside of this culture, there needs to be a constructive change to how we work together as a team to provide these products.

Mr. Stackley: Sir, I'm going to buy back one moment on that, too. Paul hit a very -- he hit the word "incentives." And the context that he uses that, I would make it much broader. If you look at the complexity of our acquisition system from end to end, starting with Congress, right down to the program manager and industry, the incentives across the board are not all aligned to the same outcomes. And as

long as that is true, we've got forces pulling in opposite directions that are impacting program execution.

Chairman McCain: But, I would like to direct the witness's attention to probably one of the most egregious aspect of these cost overruns. And, of course, that's the advanced arresting gear, which, from an original estimate of $143 million is now estimate of $1 billion. It grows so much that 2 years ago, this -- just this aspect of the carrier had grown so much, it hit the threshold to become a major defense acquisition program. And it continues, as we mentioned, to go up.

I understand the Navy has assessed how their contractor has performed on this program is consistently substandard. It's having significant difficulties meeting cost and schedule targets. Yet, we ask the contractor and the Department's contract management officials, they characterize this type of performance, to my staff, as typical or average.

Secretary Stackley, do you agree with the characteristic that a cost growth of 600 percent is typical or average?

Mr. Stackley: Absolutely not, Mr. Chairman.

Chairman McCain: Secretary McFarland, on page 3 of your statement, you said -- acknowledging that the AAG problems have had the largest effect on construction, you

stated, "These engineering design problems are now in the past." Now, that's in your statement. And yet, I have in front of me a Defense Contract Management Agency evaluation of the AAG contract performance from just this past month that directly contradicts your statement, and, in fact, expect additional delays due to issues that have not yet been resolved. Now, I understand you oversee the Defense Contract Management Agency. Tell me that -- what's the disconnect here between you and the people that are making this estimate about the AAG? And can you assure this committee that this cost increase has stopped?

Ms. McFarland: Chairman, I do not believe that the cost has stopped. I do believe that the majority of the engineering aspects of this program, in terms of technological risks and development, have been retired. There is still testing to be completed. There are still opportunities for risk to be realized as part of that effort. And I do believe that there will be activities in front of us. It's essentially that we have in front of us a program that has sunk a lot of effort into getting to where it is. And to go backward with the opportunities that this system has, operationally, to provide for the carrier does not make a good business case.

Chairman McCain: Thank you.

Would you -- I would just point out that, recently, the

manufacturers of the new tanker experienced cost overrun. They absorbed that cost overrun within that corporation. I wonder if maybe we should make that a standard procedure here in defense contracting. I think it should be a subject of a lot of consideration.

Senator Reed.

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

And first, Dr. Gilmore, you urged that shock trials be conducted on the CVN-78. And those are not going to be done on the CVN-78, they're going to be postponed to the next ship in the class, the -79. Senator McCain and I wrote to the Navy, basically accepting your advice and your opinion. Why is it so important that these shock trials begin on CVN-78, not deferred, in your view?

Mr. Francis: Well, first of all, the -- as I mentioned in my testimony, the Deputy Secretary decided to direct that the shock trial be done on the -78 before its first deployment last month. He made that decision.

It's important because history has shown clearly -- the history of shock trials has shown clearly that they are the only way to discover mission-critical failures. There has been -- there has been some claim that component-level shock qualification testing, which, by the way, had not been funded for the Ford class -- it had been defunded; now the Navy says it will do it -- and modeling and simulation are

sufficient. But, if those things were sufficient, we should never see any mission-critical failures when we do shock trials, which are conducted at less-than-design level of shock. But, we always do. And I think it was Captain Hontz who sent the committee a letter -- he was the CO of the Princeton when it was hit by a mine in the Persian Gulf -- indicating his experience with shock trials and how they provided the key information that enabled his ship to survive and function in the Gulf after being hit.

So, the history is clear that you will not know about mission-critical failures unless you do the shock trial. And I can assume, and I know, that the history that we presented to the Deputy Secretary and the Secretary figured in that decision.

Senator Reed: Very good.

Just for the record, Secretary Stackley, we are -- you're on board -- no pun intended -- with the shock trials for the CVN-78.

Mr. Stackley: Sir, we're moving out. Dr. Gilmore made reference to the component testing. The component testing was being lined up with a potential CVN-79 full-ship shock trial. We're moving that back to the left to support CVN-78.

Senator Reed: Thank you.

Let me follow up, Secretary Stackley, with the -- the

issue of off-ramps. Particularly when this was decided, in 2002, that it would be a transformative technology and risks went significantly higher -- in other cases, you have used off-ramps. I know, in -- with the DDG-1000, you were able to select a different type of motor when the desired, or at least the breakthrough, technology didn't materialize. What's your position with respect to the CVN-78 and -79 EMALS and others? Do you have a backup, or are we just going to follow this down to the point at which it can't work, and then -- one of the points I think Senator McCain has made very useful is that if we have a system that cannot accommodate every type of aircraft the Navy flies for all of our carriers, then we are diminishing our force projection.

Mr. Stackley: Yes, sir. Let me -- your touching on the off-ramps is striking a chord here. The amount of risk that was stacked up on CVN-78 without adequate off-ramps put us in a -- just in an untenable position when we ran into issues. I made reference to this Nunn-McCurdy-like review that we did on EMALS and AAG in the 2009 timeframe. That was with concern, cost and technical, regarding the program's performance. And, at that point in time, we had -- the ship was off and running, in terms of production. And so, when we look at a potential off-ramp then, it would have caused a significant halt in production, delay, complete redesign of many of the ship's systems to bring

steam back up to the flight deck to go to an alternative. So, there was no tenable off-ramp in that regard. And much of our focus then became, Will the system work? Are we confident the system will work? Can we cap the cost? And that ended up leading to a decision -- and, frankly, with the CNO chairing that decision board -- that we're going to press on, because of the trades in cost, one path or the other, the impact on schedule, the impact on performance if we were to, to that point in time, take an off-ramp that we had not planned.

Going back in time, if -- you know, if we had the ability, we could have, in fact, laid in an off-ramp in the early design stages of the CVN-78, in the event that we determined EMALS or AAG was not mature enough.

I think this was a manifestation of what became a highly concurrent, highly compressed timeframe for development, design, production, and also decisionmaking that precluded that. Your example of the DVG-1000 going from what was going to be the permanent magnet motor, which was higher risk, it failed in test, we had a backup ready, in terms of the advanced induction motor to replace the PMM, and that -- that has proven very successful, in terms of its completion of development, installation, and test on that program.

Senator Reed: Just very quickly, going forward now --

Mr. Stackley: Going forward. Yes, sir.

Senator Reed: -- one of the lessons of this very expensive exercise is that, when you're doing transformative technology, very high-risk technology, will you always make it routine to have an off-ramp?

Mr. Stackley: Yes, sir. We -- our assessment of technical risk -- if we have a high-risk system that we're bringing to a production program, we've got to keep a hand on what are our alternatives, at least to a certain decision point where the confidence is compelling to go forward. You --

Senator Reed: Thank you very much.

Mr. Stackley: You specifically asked about EMALS and AAG, going forward.

Senator Reed: Yeah

Mr. Stackley: Sir, we have absolute confidence in EMALS at this point. We have conducted thousands of cycles on that system. We have gone through what we refer to as high-cycle fatigue testing, highly accelerate lifetime testing. We've got a system at Lakehurst that, in fact, is demonstrating the performance that we need.

AAG is behind where it needs to be. All the data that Dr. Gilmore referred to, in terms of reliability, that's not because it's poorly designed, that's because we're behind where we need to be, in terms of time to demonstrate

reliability -- test, fix, test, fix. So, we have that -- a merge between development and production. Going forward, in terms of an off-ramp, first question that -- every AAG meeting I have, I start with, "Is the system going to work?" -- to make sure there's no doubt, no question, or, if there is, that we're addressing it.

The Chairman described how there was a plan to backfit AAG on all the Nimitz-class carriers. And that's proven to be not affordable. That's not affordable as much because of the impact of a carrier than the cost of the AAG system, itself. But, if we had to, we could.

Senator Reed: Thank you.

Chairman McCain: How many years have we been seeing that? It's a remarkable record.

Senator Ernst.

Senator Ernst: Thank you, Mr. Chair.

Secretary McFarland, gentlemen, thanks for being with us today.

Secretary Stackley, "test, fix, test, fix." How long are we going to continue to do that?

Mr. Stackley: Ma'am, when it comes to -- every developmental system -- we are still doing test and fix on the DDG-51 Aegis weapon system that's been in the fleet for 30 years. So, there's going to be a continual test-and-fix as you bring in upgrades and added performance improvements.

On the specific systems that we're delivering to the CVN-78, we'll be in a test-and-fix mode right through operational testing. We'll identify some further issues in operational testing, just like we do with every major weapon system that we bring to the fleet. And we'll continue to fix those.

Today, test-and-fix primarily -- primarily is software-related -- software, not hardware.

Senator Ernst: And where is this carrier right now?

Mr. Stackley: CVN-78 is about 95 percent complete at the piers at Newport News Shipbuilding in Hampton Roads.

Senator Ernst: It's sitting in a shipyard, correct?

Mr. Stackley: Yes. Yes, ma'am.

Senator Ernst: Okay. Well, Iowa, we don't have shipyards. The only time it matters to the folks back home, for me, is when they are actually out there operating. Now, across the military services, I have been told the 90-percent solution on time is better than the 100-percent solution too late. And at some point, this is going to be too late. And we are rapidly approaching that.

Now, you have been the Assistant Secretary of the Navy for Research, Development, and Acquisition since 2008. And that was the same year the CVN-78 procurement was authorized. Have you ever received adverse action by the Navy or DOD due to the delays and the $2.4 billion in program cost growth?

Mr. Stackley: No, ma'am.

Senator Ernst: Has anybody within your chain, your structure, have they ever received adverse action for this?

Mr. Stackley: In the chain, yes, ma'am.

Senator Ernst: And can you describe those actions to me, please?

Mr. Stackley: There was a program manager associated with the aircraft launch and recovery equipment who was relieved of his responsibilities.

Senator Ernst: And at what level was he? Can you give me a rank, please?

Mr. Stackley: Program manager, a captain in the United States Navy.

Senator Ernst: Okay.

And, Secretary McFarland also, have you received adverse action?

Ms. McFarland: No, ma'am.

Senator Ernst: Has anybody within your structure been --

Ms. McFarland: Not to my knowledge.

Senator Ernst: -- reprimanded? Not to your knowledge.

Folks, this is -- I can tell you, a lot of folks have been let go for a lot less. I -- and you can tell, I am extremely frustrated with the cost overruns, not being on time. There's no excuse. You can talk about all the gee-

whiz gadgets that you want. That's fantastic. But, I will tell you that this is affecting all of the other services, as well.

I still serve in the National Guard. You know, I'm a ground-pounder. Great. Good for me. We are losing in the National Guard, with this new NDAA, 8200 National Guard soldiers. We're being cut 1100 dual-status technicians. We're losing 800 Active, Guard, and Reserve members. We're being cut forces. And at some point, this is going to hit the Navy, too. If we keep spending money on gee-whiz gadgets that are sitting in a shipyard, someday you may not have the sailors to get that thing out of port. It's affecting everyone. And our taxpayers are going to hold everyone accountable for this. Everyone.

I am really upset, because I have been working very hard -- early hours, early months of my work here in the Senate, in this committee and on Homeland Security -- trying to restore the program management process. And I had a bill pass unanimously out of HSGAC on the program management. And I tried to get something into the NDAA, specifically for the Department of Defense. But, unfortunately, it didn't survive the conference. And I'm baffled -- I am baffled why we're not focusing on program management and cost overruns. This is an epidemic, and we've got to do something about it.

I'm sorry I'm on a soapbox, but you can tell that I'm

upset. The folks back home are upset. And it doesn't do us any good unless it's actually out there, providing protections for the United States. And if we keep sitting on it, not moving forward in a timely manner, it doesn't do us any good.

So, I'd like to hear a response. Just when are we going to get this done?

Anybody. Anybody, please.

Mr. Stackley: Let me specifically address CVN-78, in terms of when she will deliver to the Navy. The CVN-78, at one point in time, was going to be a 2006 procurement. It was delayed to 2007, delayed to 2008, for budget purposes. As was described earlier, she was tied to being -- to maintaining an 11-carrier Navy. Today, we're at 10 carriers. The requirement is for 11.

Since the ship was put under construction, there was a 4-month delay to launching the ship. And that was associated with getting completion levels to a higher level to ensure that we could control the costs going forward on the program. Since that time, there was a 6- to 8-week delay, that we announced a couple of weeks ago, which is tagged to ensuring that we maintain the discipline and cost in executing the balance of the test program. We have not moved the delivery date. We have changed the trials date. So, today we are still targeting an April, could go into

May, delivery date for CVN-78. All of that lines up to get the ship on its scheduled deployment in 2019.

Senator Ernst: I appreciate the response. I hope everybody understands my frustration, as well as the other members on the committee. This has got to be corrected, and somebody needs to be held accountable.

Thank you, Mr. Chairman.

Mr. Francis: Senator Ernst, I -- may I make a comment?

Senator Ernst: Absolutely.

Mr. Francis: I think your concerns about, you know, the budget are well founded, and how those bills are going to be paid. I think, if you look at the CBO's analysis of the Navy's shipbuilding plan, if it's executed as it's currently planned, the Navy will need a 30-percent bigger budget than it's historically gotten. So, that's on the Navy side.

On the Air Force side, we have the tanker, we have the JSF, and the Long-Range Strike is coming. And, at the same time, the Army is shrinking.

So, those bills are going to have to be paid somewhere. And then, if they're higher than even we think now, we're going to be in real trouble.

And on the program managers, I remember we were at a hearing a few months ago, and you had asked me a question about that. One thing I wanted to bring up which I didn't

then is, we really put program managers in terrible positions. So, when we create business cases where a program's underestimated and there isn't enough schedule to get things done, and technology's immature, we put a program manager in that position. And they have to do two things. They have to manage the program and impart discipline; at the same time, they have to defend the program. So, what we do with our program managers is not what industry does, and we grind really good people up. It's a wonder they take the jobs.

Senator Ernst: Exactly. Thank you so much. I appreciate it.

Admiral Manazir: Senator Ernst, may I make an operational comment?

Senator Ernst: Yes, absolutely, Admiral.

Admiral Manazir: Captain John Meier and his crew have moved aboard Ford. They're in the galley aboard Ford. They're operating almost 50 percent of the systems, and the crew is extraordinarily happy with the ship at this point. Secretary Stackley has already outlined the retirement of risk in the timeline, and we'll have to do that, but the warfighter does need this ship. And we're pleased with the fact that the crew likes the capability that we're delivering there, and the statement referred to that capability. Yes, ma'am, absolutely, costs more and is

taking longer, but we will have that ship delivered with that higher capability by the time it deploys. And I'd just like to note for the record that the crew is very happy with the technology we're delivering to the warfighter.

Senator Ernst: And thank you, Admiral.

I'll make a closing comment. I have gone way over my time, but I will tell you, $2.4 billion is a lot of up-armor that could help the guys on the ground, as well. We could have saved a lot of arms, a lot of legs, a lot of lives if we had had that money allocated in our budget, as well.

Thank you.

Senator Reed [presiding]: Thank you.

On behalf of the Chairman, let me recognize Senator Manchin.

Senator Manchin: Thank you, Mr. Chairman.

Let me just say that it's just that it's unbelievable to sit here and listen to this. And I'm reminded -- in a 1961 farewell speech of then-President Eisenhower, "In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military industrial complex."

Mr. Francis, I don't know how -- I'd like to know how you're able to do this job and be -- keep from being so frustrated, seeing the recommendations, seeing the forecast that you've put out in all these years, and knowing that the

deficiencies will happen. So, what I would ask -- Has anyone followed those people who have left? I think someone mentioned, here, how many of -- people that were in charge, whether it be from the Secretary on down -- how many have left during the process of some of these acquisitions, and where they had -- where they have gone to work afterwards?

Mr. Francis: I don't know if -- that there's a comprehensive study. I think --

Senator Manchin: Back home, we always say, "Follow the money," and you can usually figure out what the problem is.

Mr. Francis: Yes. I think there's a fair amount of, you know, government personnel retiring and moving to industry.

Senator Manchin: Do they move to the same industry that -- basically, that they were in charge of overseeing?

Mr. Francis: Well, there are laws about conflict of interest, and they apply to different levels. So, they have to abide by that. But, many of them do eventually do that.

Senator Manchin: What I'm understanding, in listening to the testimony, sir, that there's no repercussion whatsoever. I think this -- the last statement was made, Mr. -- Secretary Stackley -- nobody at a higher level has ever been reprimanded, relieved, or whatever, for incompetency, but someone at a lower level has been. One person was mentioned. You know, in the private -- back home

in West Virginia, if we build a home and it goes over budget, and then let's say later on they build another home, you would learn from the first one. You know. And the definition of "insanity" is continue to do the same thing and think you'll get a different result. You would think that sooner or later we would learn.

Mr. Francis: Well, I think Sean make -- a very good point when he went through -- these programs take so long. The leadership changes, at every level, so many times that, you know, we're starting over again. And the people who are in the position now don't remember what happened then.

I'll also say, I don't think this is a case of bad actors. I think these are people trying to act rationally in the environment --

Senator Manchin: I'm not accusing anybody --

Mr. Francis: Yeah.

Senator Manchin: -- from being --

Mr. Francis: Yeah

Senator Manchin: -- intentionally a bad actor. I'm accusing probably the system, the way it's evolved over the years.

President Eisenhower saw something coming. There is something that got his attention for him to make this statement in his farewell speech. And, being a military person, if we had operated in World War II, probably, he was

thinking, the way he saw the evolution of the industrial complex, military, God help us in World War II, probably what -- I'm saying something stoked his interest to say, "We've got a problem. Be careful." And you're telling me this has evolved for 50 years.

Mr. Francis: Yes.

Senator Manchin: So, he had tremendous vision back then, knowing that we were going down a slippery path.

I'm just saying -- I was looking at what Russia -- I mean, what China's able to do. And if you look at how they're able to advance and jump in very quickly. I'm sure there's other -- they've had other ways of acquiring the information they're getting, and we have suspicion about that. But, still yet, there is a process, a move that they're able to do things in a much quicker timeframe.

What would -- what recommendation would you make to us as -- of all of us here, and people that make decisions, and people that maybe can change the law or create laws that would help us or prevent this from continuing? GAO, we pay no attention to you all. It's a shame. There should be a law that, when GAO basically makes a recommendation, we should at least owe it to the American people to give you an answer back why we accepted your recommendation or why we don't accept your recommendation. It's very simple. And myself and a -- former Senator Coburn tried to get that

done. Someone has to answer to what you're seeing and we're not doing. What's your recommendation for us to fix this system?

Mr. Francis: I actually don't think it's a matter of law or regulation or telling the Department to do anything. I think it's -- when you're making -- your biggest opportunity is when you're approving a new program and you really have to scrutinize that program for what principles it embodies. So, if you really believe in "mature technologies before you put them in a program," if you really believe in "fly before buy," if you really believe in "realistic estimating and scheduling," and a program comes up that doesn't measure up, you've got to say no.

Senator Manchin: Mr. Francis, if I may -- and I'm reading -- "The GAO found" -- this is in 2007; you mentioned this -- "the Ford-class aircraft carrier's lead ship began construction with an unrealistic business case."

Mr. Francis: Yes.

Senator Manchin: You identified that. Didn't anybody here, or whoever was there at the time, did they talk to you? Did you give them that information, what you saw in evaluation?

Mr. Francis: Wow. I'll tell -- yes, in terms of the report. But, I believe this is the first hearing on the carrier where outside witnesses have been invited. I think

that's right.

Senator Manchin: Well, I thank the Chairman for that, because he's had some great hearings for us learn a little bit more about. I just -- sir, I -- I mean, I appreciate all your services.

Ladies and gentlemen, we've got to change. $18 trillion of debt and the way we're climbing, and our military is under-funded from the standpoint -- or less -- or lack of direction.

But, Mr. Francis, thank you. And I'd love to meet with you later on, sir.

Mr. Francis: I'd like that.

Senator Manchin: Thank you.

Chairman McCain [presiding]: I thank the Senator from West Virginia for his involvement and his commitment on this issue.

Senator Tillis.

Senator Tillis: Thank you, Mr. Chair.

Mr. Francis, I think you opened up your statement by saying "the same story, different program." And you also commented, in your opening statement, about the -- this committee and the Senate -- or Congress as a whole, playing a more aggressive oversight role than we have over recent years. So, can you give me some sense of how much of that is going forward with new programs, how much of that should

be applied retroactively to this subject or any of the other major projects that we have. What are your recommendations to this committee for what, specifically, we should do, say, in the next committee meeting or over the course of the year?

Mr. Francis: I would say, right now we're kind of in a period where there aren't as many big, new programs coming down the pike. And that's really your opportunity. I don't know how much you can do on a program that's already through the milestone and under contract without making more of a mess of it.

Senator Tillis: Well, what -- maybe just going back, I think you used the analogy of seven home runs in the bottom of the ninth with respect to this graphic, here. To what extent do we need to go back and say, "We know" -- I think maybe the Twins did it to the Tigers this season, but it's very uncommon. It was widely reported, as a result. So, what do we need to do, with respect to this timeline, about being realistic that we're going to have a timeline that we're going to achieve? What do we need to do here to at least just not come back and have the same frustrations that Senator Ernst has about -- we see it, we know it's not likely to happen; therefore, what should we be doing to set realistic expectations about what's already in the pipeline?

Mr. Francis: So, for something like this, I would say

-- and I think the Navy has moved the schedule out a little bit so far on integration testing -- I think you have to make it okay for the Navy to come up and say, "We need to move this schedule, and it's going to cost more." That has to be okay. And right now we sort of play this -- we're on eggshells, because, you know, the Navy might not want to come in and say that, because they're going to take a beating over increased cost. So, we kind of play --

Senator Tillis: Not wait until it happens.

Mr. Francis: Wait until it happens.

Senator Tillis: Yeah. And I will tell you, as somebody who's been in long -- you know, has been responsible for long-term, complex projects, that's when people lose their jobs. I think that the thing that we ought to put on the table now is, if you come back and you explain to us why you're going to miss your dates, that becomes our problem, it becomes senior leadership's problem in the Department. If you wait, and ultimately realize or come to us and actually say, "Well, you know, we were wrong," then somebody else needs to lose their job. It's a matter of whose problem it is. I can -- and I'm not citing any one person, but it seems like it's obvious that we're going to have to pull a rabbit out of the hat to achieve these dates. Somebody owns the responsibility to speak honestly about that and set the right expectations. And if

they don't, then they need to own it. And I think -- I don't think you disagree with me.

Mr. Francis: No.

Senator Tillis: I think, going forward, because you said it's the same story, different program, we do need to come up with some sort of findings of fact before we approve future programs so that we can really have people own this, going forward, instead of having it, as Senator Manchin said, be the insanity that seems to be driving a lot of these large, complex programs.

For the Admirals, I'm going to ask you just a general question. First off, with respect to China, I know we spend a lot of time trying to take the edge off of our quantitative disadvantage with, say, a country like China that's churning out a lot of ships by the qualitative advantage. But, as Admiral Harris said, quantity has a quality of its own. At some point, we just -- our capabilities may end up being matched by the sheer quantity that some of our potential adversaries are building up.

What was so important, in terms of some of the unproven capabilities that are going onto these ships -- what sort of leap in capabilities justified the cost overruns and the -- and the basis of the discussion we're having today? And I'll open it up to any of the Admirals. And, in advance, thank you for your service.

Admiral Manazir: Senator, as the Director of Air Warfare, I'm responsible for stability of requirements that go into our acquisition programs. When you have stable requirements, you control cost, or at least that's one aspect of controlling costs. When we developed the Ford-class carrier, starting in the mid-'90s, with a -- actually before that -- a look at the future of aircraft carriers, we don't look at only one country, sir, we look around the world at potential conflicts. And we take the conflicts from relatively low-end conflict, like you're seeing in the north Arabian Gulf, with the carriers that are operating over the top of northern Iraq and Syria, and we look at higher-end conflicts against countries who can, through technology, attempt to match our capabilities. We do campaign modeling. We actually have names for them, like Thunder and Storm, and they are joint campaign models using U.S. Air Force, U.S. Navy, U.S. Army, and other military assets to effect that campaign.

As has already been stated by Secretary Stackley, the United States Navy nuclear-powered, the largest place of an aircraft carrier is a chess piece in our Navy. Those chess pieces are a critical factor on the campaign plans that we bring forward. When we looked at the future and the way that the threats around the world were going, we devised the Ford-class, with 33-percent greater sortie generation

capability, with enhanced technology and an electric capacity, and, with the EMALS and AAG, an ability to increase getting airplanes on and off the ship, and other technologies around the ship. That campaign model, sir, looking at threats around the world, is what delivered the requirements base that resulted in the Ford design you see today. When we stabilize those requirements, sir, that is one aspect of stabilizing the cost and schedule.

Admiral Moore: Sir, if I may, from a pure acquisition standpoint, the other reason from -- that we built the Ford-class is, the Nimitz class was starting to reach the end of its useful service life. Technology does change. We have to keep up with that technology. But, the other thing is that the Nimitz class was built in an era where people were relatively inexpensive. And so, from a total life-cycle cost perspective, the Nimitz class is very expensive. People make up 40 percent of the cost of that ship over its 50-year service life. So, it was pretty clear, as we went forward, not only did we need the warfighting capability, but we had to drive long-term affordability into the ship over the 50 years, and the most important thing we could do in that respect was to get people off the ship. That required a complete redesign of the ship. Some of the things you're seeing with the new technology -- EMALS and AAG, for instance -- not only do they provide operational

capability, but they also provide a significant reduction in the people on the ship.

So, we're going to take 663 sailors off of Ford, compared to Nimitz, about 1200, when you compare the air wing. The net result is, over 50 years, the cost to buy that ship, own it, operate it, and maintain it would be about $4 billion less than a Nimitz-class carrier today.

Chairman McCain: Well, I must say, all those things that both Admirals pointed out are undeniably accurate, but those numbers there are totally unacceptable. And I hope you realize that.

I'd like to point out that Senator Kaine has been more involved in this situation in regard to this carrier than any member of this committee. He has been very constructive. He's been incredibly helpful in informing this committee. And he is a strong advocate for the men and women who are doing great work in the construction of this -- of these aircraft carriers in arguably one of the finest shipyards in the world.

Senator Kaine.

Senator Kaine: Thank you, Mr. Chair. And thanks for your comments about the shipyard. I'm proud to represent the thousands of shipbuilders who manufacture the largest and most complicated items on the Planet Earth, nuclear aircraft carriers and subs, many from North Carolina and

Virginia, who work at the shipyard. And they didn't make the decision about putting all the new technologies on the first in class of the Ford class. They also didn't develop the weapon systems that have -- and the AAG and EMALS systems that have been complicated. Those were developed elsewhere, and they're working to install them. But, I've been on the ship many times, and seen the work that's underway. I saw the core inserted into the ship one day. I've seen the Navy take control of the ship in recent months, and they are very excited about it. But, a couple of items:

Cost overruns. And I agree that there's very systemic issues that are demonstrated that we need to tackle them. Cost overruns, I would say that a lot of this is less an overrun than poor cost estimation. And I think you unpack what cost overruns are: poor cost estimation.

Before 2010, when the Navy was talking about their cost estimate on this project, to this committee and others, repeatedly the Navy said that their confidence level in the cost estimate was less than 50 percent, or even, in some cases, less than 40 percent. Isn't that correct?

Mr. Stackley: Yes, sir.

Senator Kaine: And I gather that that was because first in class and the addition of all these untried technological systems, as mandated by a previous SECDEF,

that was one of the reasons that the confidence level was low. Is that right?

Mr. Stackley: Yes, sir.

Senator Kaine: Now, let me talk about first-in-class history, because, Mr. Francis, you talked about, you know, this is a similar problem, but just a new example. I think it was Eric Labs who did the CBO study this summer, where he basically looked at Navy acquisition programs. And he looked at first in class over a variety of programs. And he basically concluded, I think, that, as a general matter, first-in-class acquisitions in shipbuilding tend to be 30 or 40 percent higher than the estimate that the Navy has begun with. Isn't that essentially true?

Mr. Francis: Yes, Senator. I think in my statement we have listed the most recent, the first in class, and the average cost increase is 28 percent. So --

Senator Kaine: So, I'm not going to defend 23 percent as a -- as better than an average, but, to put it in context, this isn't that unusual. But, maybe the thing that is more important is what happens after first in class. So, first in class on the Ticonderoga-class cruiser, there was a lot of problems, "An obese $1 billion walrus of the high seas with potentially dangerous stability problems." That was the assessment of the first-in-class by Defense Week in 1982. That program ended up being significantly improved as

it moved along. The Arleigh Burke destroyer, it was called "the Navy's billion-dollar hole in the water, another example of the Navy driving itself to the poorhouse in a Cadillac." That was the Washington Post in 1986. But, generally, that acquisition program significantly improved after the first in class.

One that I really love from our shipyard is the Virginia-class submarine that's done in tandem between the shipyard in Newport News and Electric Boat. That's turned into a very successful acquisition program. But, wouldn't you agree the first-in-class of that had some significant challenge and cost overruns or cost estimation problems? Have I basically given the history correct on these three, the Ticonderoga, the Arleigh Burke, and the Virginia-class?

Mr. Stackley: Sir, you're absolutely correct.

One important thing to keep sight of is, in each case, unlike other major weapon systems programs, there is not a prototype --

Senator Kaine: Right.

Mr. Stackley: -- ship.

Senator Kaine: Right.

Mr. Stackley: The lead ship is the prototype. It is the first opportunity you get to bring these complex systems together, integrate, test. And there are uncertainties, unknowables, and risks that get brought to that ship, in

production, when it is most costly to find and fix those issues.

Senator Kaine: I love the "try it and buy it." For some weapon systems, that's really what you do. You prototype it and try it and then you buy it. But, for a ship of this size, the prototype is the actual. And that's why you often see difference between first-in-class and the subsequent history.

You talked, Secretary Stackley, about the changing in the contracting mechanism between -78 as a cost-plus to -79 as a fixed cost. And I'm assuming -80 will be fixed-cost, as well.

Mr. Stackley: Yes, sir. Both -79 and -80 will be fixed-price contracts.

Senator Kaine: And then, finally, on just the -- Senator Tillis asked the question about the O&S savings. Actually, for as much we talk about the cost of constructing, actually the cost of operating is even larger on platforms such as this, because they have such a long life. And I gather that one of the main design features of this is to put in physical design to dramatically reduce the number of sailors and then drop the personnel cost by about $4 billion. Now, I credit -- it was either Dr. Gilmore or Mr. Francis who said yes, there's a projected savings in personnel cost, but we haven't achieved it yet. We -- you

know, we have to see whether that's accurate. There may be some challenges that would reduce that. But, I do know that those -- bringing down the number of personnel is one of the main advances over the Nimitz design that's part of this Ford class. And obviously, I think the committee should stay very much on y'all. We should all stay on it to make sure that that's actually achieved.

I strongly support the Chair's acquisition reform strategy. What we did in this year's NDAA was important. But, I think, Mr. Chair, I certainly see that as just a downpayment on what we will be doing, going forward. And I think it's important that we do it.

Mr. Francis: Senator Kaine, can I make a --

Senator Kaine: Please.

Mr. Francis: -- a couple of comments?

Senator Kaine: Please.

Mr. Francis: First, on the contract for the CVN-79. The current contract is fixed price. That covers about 45 percent of the construction cost. Fifty-five percent has already been paid for under a cost-plus contract. So, just keep that in mind.

And then, I think you're exactly right on -- the first-of-class of any weapon system, we seem to have a lot of trouble with. And then, later on, we kind of get comfortable with the fact that we've worked out the problems

and everything looks good. And it creates a little complacency. So, I think a challenge for us, if we're repeatedly having trouble with first article -- and it's not just Navy -- what is it we can do, in terms of estimating and risk analysis, so we're not making those same estimating errors every time?

Senator Kaine: Good point.

Ms. McFarland: Could I add to that, Senator? I think it's important this committee has actually received from the Director of CAPE a information package that showed that, since the implementation of WSARA, that the cost estimating techniques were improved because we were given access to information and data right directly from contractors. And it shows that the disparate distance between the service cost positions and the independent cost positions has gone at a median from over 6 percent to less than 2 percent and 3 percent, which is in the margin of error.

So, over the last period of time, what the Senate points out is exactly what needs to be done to improve our future understanding of how costs are gone.

Chairman McCain: But, isn't it also true that the delays in CVN-78 have had a significant effect on the cost of CVN-79?

Ms. McFarland: Go ahead.

Mr. Stackley: Yes, sir, there's -- the program plan

for the carrier, CVN-78, -79, and -80 has been stretched out, programatically and budgetarily. So, as I described earlier, 78 was originally going to be an '06 carrier that became '07, then'08. In the 2008 NDAA, the Navy was authorized to procure the -78, -79, and -80 on 4-year centers, which was consistent with 12-carrier Navy. The decision was subsequently made by the Department of Defense that we're going to stretch that out to 5-year centers, so now the CVN-79, which was going to be an earlier carrier, is not put under contract until 2013 budget, and then the -80 was bumped further. So, the program has been stretched out, and that's brought, frankly, more cost to the program just associated with costs that run with time.

Chairman McCain: Senator Ayotte.

Senator Ayotte: Thank you, Chairman.

I want to thank all of you.

I just wanted to say that I think one of the challenges -- Mr. Francis, you referenced this in your testimony -- is, here we sit here today, billions of dollars of overrun, and people are very frustrated by it. And you cited also that the JSF program, the F-22, the Littoral Combat Ship, they were actually worse, and that this is a typical acquisition outcome.

So, here's the challenge. We've got to change this dynamic, because we've had the leaders of all of our

military rightly come in here and testify about the impact of sequestration and the fact that we're going to diminish the size of our fleet, that we need more ships, more attack submarines, more ground troops, obviously more fighters and making sure that we also have the training, of course, for our men and women in uniform. And then my constituents look at these billions of dollars of overruns that have been multiple examples of it, and look at us and say, "Why aren't you dealing with that? If we're going to give you more money, then we need you to deal with that." So, all of us who care very deeply about making sure that we do what needs to be done to defend this great Nation, this is an issue that we've -- it's got to go from being the bottom priority to a top priority.

So, one question I'd ask all of you, whoever is the best -- Secretary Stackley, Secretary McFarland, if you're -- Mr. Francis -- who is best to answer this -- you mentioned aligning responsibility, accountability, and decisionmaking. How are we rewarding good acquisition behavior within the Pentagon? In other words, if you are doing a good job, how are you rewarded? And, in turn, I think one of the questions you're hearing from all of us is, How are those being held accountable, not just at the captain level that we've heard about today, but at the highest levels that this has to be a priority for all of us

if we want to make sure that our men and women in uniform have what they need and that we can make this case to the American people about how important this is?

So, whoever is best to field that. But, I think that's the big question here. We're clearly not aligned in accountability priority and how we're rewarding the people who are doing a good job and also holding accountable the people who aren't doing a good job. And I'm sure that's demoralizing to the people who are doing a good job.

Ms. McFarland: Senator, I think your points are very well made. I'm not sure we reward our program managers very well. I think the only thing that I could see from my experience is, you promote them.

In terms of holding folks accountable, when we see a clear connection between what they did and their outcome, we do retire them or move them, both civilian and military. Beyond that, the incentive structure that you're referring to is not clear, and it's not adequate, and it ties to what the earlier -- Chairman and the Ranking Member talked about is, where those decisions are made. And what Paul talked about, in terms of, How is it that the culture and how the decisions are directed into a program manager relates to their ability to perform.

Senator Ayotte: Well, one thing I would say is that also, as leaders, if you've got someone you've got to let go

at the captain level, the leader needs to be held accountable also, because any one of us, if our team does something, we're ultimately responsible, right, as the leaders? And I think that coming from the top is so critical of making this a priority.

I had a specific question also about what Senator McCain referenced, Mr. Francis mentioning the KC-46 program and how the contractors absorb the cost overruns. Wouldn't it make sense for all major defense acquisition production programs to be designed so that the contractor absorbs the cost overruns for production?

Ms. McFarland: If I could, Senator.

Senator Ayotte: Yes.

Ms. McFarland: I think it's important to understand the risks. Sometimes the threat drives us to take risks because we need to. And when the risks aren't clear, that cost-sharing between us and the contractor has to be considered. When we ask for a fixed-price contract when the risks are high, the contractor, in order to get their corporate headquarters to agree upon working in that contract, they add that risk related to costs.

Senator Ayotte: So, I understand that issue with regard to R&D, but what I'm talking about is production costs.

Ms. McFarland: I agree with you in production.

Senator Ayotte: So, are we doing that consistently across the board on production?

Ms. McFarland: We took a look at our contracts across all the enterprise, across the services, and, indeed, yes.

Mr. Stackley: Let me make one point regarding that. And we talk about shipbuilding, the lead shipping of prototype. Historically, the lead ship of a new class has been a cost-plus ship, with the follow ships being production. Over the last -- frankly, since I've been in this office, we've been trying to drive down the number of cost-plus ships in our program. And today, across the Department of the Navy, we have two cost-plus ships in production, one of those is the CVN-78.

Senator Ayotte: My time is up, but I also will submit a question for the record that concerns me. As we looked at the CVN-78 cost growth, I'd like to understand, as we look at the Ohio-class submarine replacement program, what lessons we've learned from this so that we don't go down the same road with the Ohio-class, which is obviously very important to our Nation. So, I'll submit that for the record.

[The information referred to follows:]

[COMMITTEE INSERT]

Senator Ayotte: Thank you all.

Mr. Francis: Senator, can I jump in on the time you don't have left?

[Laughter.]

Senator Ayotte: Of course. With the Chairman's latitude. How's that?

Mr. Francis: Thank you.

I -- on -- you're right, on production contracts. They should be fixed price. But, there are still times -- ships aside, there are still some contracts that are cost-plus going into low-rate production. And you do have to match the risks you're taking with the contract. So, a good contract can't save a bad program. So, if the risks are high, I don't necessarily fault the contract type. I raise the question, Why are we going into production if we're not done with development yet?

Senator Ayotte: Well, if it's a bad program, we shouldn't be investing in it in the first place. Isn't that the fundamental question?

Mr. Francis: Yes. Or if it's just not ready to take the next step.

And then, on your first point, on program managers and people held accountable, I think it's a really good philosophical question about: Accountable for what? What constitutes success? So, if I'm a program manager and I'm

trying to get my program through the next milestone, and I do that, and then there's a cost increase, what am I going to be rated on? Getting it through the next milestone or the cost increase? And it's going to be the former. If you can support the program and get it moving, that's your -- that's what you're mainly accountable for.

Senator Ayotte: Well, that's a problem --

Mr. Francis: Yes.

Senator Ayotte: -- because if it costs you a lot more and you're putting it through, but you get it on time, that's not meeting your target. And so, people need to be held accountable for both. Otherwise, this is where we end up, with the billions of dollars in overruns.

Thank you.

Chairman McCain: Senator Hirono.

Senator Hirono: Thank you, Mr. Chairman.

I know that the Department has -- undertaking headquarters reductions, and Congress has reiterated the need to look at reducing headquarters positions for efficiencies and other savings. And, while we all want to reduce waste and inefficiency, I would urge the Department to look at possible headquarters reduction targets on a case-by-case basis and to make informed decisions, keeping in mind that cuts today can come back to cost much more in the long term than we get in the short-term savings.

The acquisition workforce is vital to ensuring that our acquisition programs, such as the Ford-class carrier, are managed and lead to successful outcomes so that our men and women in uniform are given the tools that they need to effectively carry out their missions. We have to ensure that we are able to recruit and retain a quality acquisition workforce if we are to be successful in defense acquisitions. And if we have acquisition teams that are understaffed, undertrained, or too inexperienced, we cannot expect to have good results in our acquisition programs.

As described in Secretary McFarland's testimony today, we cut the DOD acquisition workforce by roughly 57 percent during economy drives of the late 1990s and early 2000s. I believe that these deep reductions contributed directly to a large number of the problems that DOD has had in major acquisition programs over other last two decades. And I agree that Congress has an important oversight role to play on acquisitions. However, at the start, I want to know that our acquisition workforce can perform and that we can rely on the analyses and processes of our acquisition team before a program is recommended.

Therefore, when we look to implement mandatory cuts to headquarters, we should be -- we should consider the potential long-term effects on our acquisition programs among, of course, other programs.

So, for Secretary McFarland, what is your assessment of the health of the acquisition workforce --

Ms. McFarland: Senator --

Senator Hirono: -- especially as we deal with these very complicated acquisitions that we are -- such as the Ford class?

Ms. McFarland: Senator, first, thank you. This is such a human endeavor. That is the principal understanding of the underlying problems that we have inside of acquisition, is to ensure that our workforce is appropriately trained and experienced to do these jobs.

In 1986, we had 622,000 core acquisition people. By the timeframe of this program, in -78 was conceived, in '96 through 2002, we had reduced that workforce to less than 300,000 people.

This committee and Congress in general has provided us the Defense Acquisition Workforce Development Fund that has allowed us to regrow, retrain, and reeducate about 8- to 10,000 people to bring abroad since then. That has been a critical improvement to where we are. The majority of our workforce is imminent to retirement. The workforce that we do have is predominantly younger and not necessarily in age, but rather in experience. And this program and these capabilities that we're discussing were inherently bred by people that may not have the adequate acquisition experience

or understanding of the business case that needed to be executed here.

So, I would say that we're very fragile right now, is the best way I could say it. These people are working very hard, they're very loyal, they're patriotic people, they don't get very well paid, they get a lot of abuse in the press. There is also an opportunity to forget what they have done that is done well, like the JLTB program that's actually been put together under the principles of WSARA and the better buying-power initiatives. And I can really commend the services -- the Navy, the Marine Corps, and the Army -- for that program and others that are doing much better by having that disciplined approach.

The only way we're going to protect our future is to invest and protect that core capability.

Senator Hirono: Secretary Stackley, would you like to comment also?

Mr. Stackley: Ma'am, I think I'll add just one comment.

Back in May of 2014, Chairman McCain and Senator Levin signed out a letter soliciting inputs from a number of individuals and organizations regarding, What do we need to do to improve this acquisition system? And I was fortunate enough to have the opportunity to respond. After giving it much thought, first and foremost my concern and conclusion

was: programs that succeed succeed because you've got a highly talented, experienced team in place, that is able to overcome work through, in, and around this very dense, difficult system that we've got and, at the same time, master the technical details and programmatic oversight to deliver complex weapon systems; programs that fail quite often fail because of not having the same attributes, in terms of the acquisition workforce team. And so, first and foremost, we've got to give us the tools to attract, train, and retain those professionals to get the job done.

Senator Hirono: I emphasize how important it is to have an acquisition team that we can rely upon, because these are very complicated systems and programs, and it would be very difficult for Congress to be the first line, in terms of analyzing the efficacies and the reliability, et cetera, of these programs, so I expect our acquisition people to do that. And therefore, you know, thank you very much.

Mr. Chairman.

Chairman McCain: At Secretary Carter's hearing for confirmation, I showed a chart, $40 billion that was spent on programs that never became reality. That is not an acceptable system or situation. We value the men and women who work in this business, but these problems are of such magnitude, in the view of most members of this committee,

that we can't lose sight of the fact that the system is badly broken.

Senator Sullivan.

Senator Sullivan: Thank you, Mr. Chair. And thank you for your leadership on this issue, in terms of oversight. Critically important function of this committee.

You know, I'm not sure the question has been asked, but maybe I'll just ask it. Pretty simple. Secretary Stackley, Secretary McFarland, who is responsible? Who's responsible? Who's kind of raised their hand and said, "This cost overrun is my responsibility. I accept it"?

Mr. Stackley: Sir, I will tell you that, today, I'm responsible. You see the gentlemen here at the table that are responsible for elements of the program that all come together to the -- for the carrier. But, as the service acquisition executive, as I stated in my opening remarks, I assume responsibility for this program and the decisions that I have the opportunity to make as we execute.

Senator Sullivan: Secretary McFarland?

Ms. McFarland: Sir, the Navy is responsible --

Senator Sullivan: No, no, I'm not talking about an organization. That's very amorphous. I'm talking about people, individuals.

Ms. McFarland: Sir, I believe we could have done much better in preparing and advocating for the right aspects of

this program to be conducted at the beginning and throughout its execution.

Senator Sullivan: So, who's responsible, in your view?

Ms. McFarland: The Department. Not a good answer, not something that --

Senator Sullivan: No, it's a ridiculous answer. Okay?

Ms. McFarland: Yes, sir.

Senator Sullivan: So, who -- in your view, who is responsible? Part of the issue here is that the responsibility seems to be placed in a --

I mean, Secretary Stackley, I appreciate your statement. Right? That's up front.

Secretary McFarland, I'm just asking the same question to you. Who is responsible? I'm talking about individuals. That's how we fix it. We can't blame it on "the Navy."

Ms. McFarland: Sir, I will take absolute responsibility for not having done the correct things, in terms of helping this program along.

Senator Sullivan: So, who's responsible?

Ms. McFarland: Then I would say myself, sir.

Senator Sullivan: Okay.

Admiral Moore, Admiral Gaddis, I -- you know, looking at your bios, very impressive, in terms of your military careers. When you get assigned to be the billet of a program manager, as a senior flag officer in the United

States Navy, is that something that, when that happened, you celebrated? Is that something you were, like, "Oh, geez"? I mean, how is your job, as uniformed military officers, viewed in the Navy? And is that part of the issue, here?

Admiral Moore: Well, other than I got to spend my 16th consecutive year in Washington, D.C., if I had taken a job, yeah -- no, it's --

Senator Sullivan: I feel for you.

Admiral Moore: -- it's an honor. I -- you know, when --

Senator Sullivan: But, I mean, is that a career enhancer, to successfully complete a tour that's obviously filled with landmines, or is that something you try to avoid? What I'm getting at is, Do we have our most ambitious, top-rated officers trying to get these jobs, or are they trying to avoid them? And is that part of a problem?

Admiral Moore: Sir, I believe, you know, this is the best job in the Navy. I was honored to be asked by Secretary Stackley to take the job. I think most of us sitting at -- or anybody sitting at this table at our level will tell you that we want the challenges and we're not going to shy away from the responsibilities that go with the job. I'm ultimately accountable for this program with Secretary Stackley. I accept that responsibility. I want

the tough jobs. I was glad to take it. I think we've made strides on -78. We're -- nobody is happy with the cost overruns we've had on -78. I think we've done significantly better on -79, and I think we're on a good path, going forward.

But, to the -- to your basic question, good people want these jobs. They're tough jobs, and I think you're going to continue to get the right people in these jobs, going forward.

Senator Sullivan: So, I -- and I know you see the frustration from the committee. I think Senator Ernst did a very good job of articulating that, in terms of -- you know, we talk about dollar costs, but what we're really talking about is opportunity costs with regard to the defense of our Nation. So, just one of these cost overruns on one of these carriers could fund a brigade combat team in the Army for 10 years. That's a really important issue. And the Army wants to cut 40,000 troops right now. And so, strategically, it just doesn't seem to make sense.

Let me ask a quick question, following up on Senator Ayotte's comments. Do we need -- do you need statutory authority to have the responsibility of cost overruns be borne by the contractor and not the American taxpayer, or can you do that now, presently?

Admiral Moore: Sir, we have the authority, when we

contract with the contractors, to put contracts in place that hold them accountable.

Senator Sullivan: And so, you -- we're making that, from a production standpoint, regular part of our contracting work right now?

Admiral Moore: Yes, sir, absolutely.

Senator Sullivan: Thank you, Mr. Chairman.

Chairman McCain: Senator King.

Senator King: Mr. Chairman, first I want to thank you for your interest in this topic. I think it's one of the most important responsibilities that we have. And -- but, I do think, in terms of the -- today's discussion, that there needs to be some context.

I suspect the first Macintosh computer cost a million dollars, in terms of the work. I've read about the work that they went through to develop that computer. But, then they made them by the thousands or millions, and they went down to -- the price went down to $1,000. I think one of the problems here -- Mr. Francis, you identified it, and I think this is where we really need to focus our attention -- is that we're dealing with first-in-class products. We're dealing with new products. And you mentioned two terms, "fly before you buy" and "mature technologies." And I understand that. But, the problem is, we're building a product, here, that's supposed to have a 50-year life. And

if we build it with "fully mature" and "fly before you buy" technologies, it's going to be obsolete the day it enters the water. And we're talking about a qualitative technological edge.

So, I really think we -- and as Senator Kaine pointed out, we're essentially building prototypes. There's no way to do a prototype -- that first Macintosh, you know, was a prototype that we could sit on this desk, but a build -- you can't build a prototype of a -- of an aircraft carrier.

So, I think the problem -- and you identified it, Mr. Francis -- how do we deal with the first-in-class issue? And maybe it's more realistic estimates at the beginning. Maybe it's more realistic estimates of the time. But, it -- to simply say there's an overrun here, as Senator Kaine pointed out, if the estimates in the beginning had been more realistic, there would be no overrun, it would have been what was estimated.

So, Mr. Francis, how do we deal with this -- it's a risk-and-cost balance, it seems to me. And, in order to build the highest technology, most advanced weapon system, we're going to have to take risks, in terms of being sure that that technology is the most advanced possible when that ship launches. Talk to me about what you identified, I think, properly. This isn't an overall procurement problem of the -- all of the military, but the fact that it seems to

happen in every branch, on every weapon system, when -- the first -- whether it's the F-35 or this or other ships or other weapon systems -- tanks, you name it -- how do we deal with this first-in-class issue?

Mr. Francis: Well, Senator, I think there's a way to take risks, so we need to take them. Our position has been, let's take more risks in science and technology before we get into acquisition. That takes money. And we're kind of stingy about money before we get into a program.

Senator King: Would it be accurate to say that some of these ships are -- that some of these systems -- this is an R&D project. This --

Mr. Francis: Yes.

Senator King: -- is R&D on the hoof.

Mr. Francis: Yes. And so -- we talked earlier about off-ramps. I think Sean talked about them. If you're going to take a risk, I think we should say -- let's say we're taking a risk, and we've got an off-ramp, so if this doesn't work out, we've got a Plan B. We tend not to do that. We tend to bet that this is going to come out just the way we say.

And if you look at the original plan for the CVN-78, these systems were going to get wrung out in land-based testing before they got on the ship, but we were too optimistic about the schedule for that -- taking that risk.

So, they slid onto the ship.

So, myself, personally, I don't -- I'm not terribly concerned about the types of problems we're having on those systems. It's when and where we're discovering them. That's the problem. So, I think there's a way to take risk, to take it more intelligently.

Again, I come back to the acquisition culture. The culture here is to say there is no risk, that we can do it for low cost. If you come in and say it's going to cost 13 billion, maybe you'll get told no. And so, you can't put that on the table. So, somehow our culture has to change so we can say, "It's okay to take a risk, and here's how we're going to do it."

Senator King: And, of course, one of the problems here is that we're talking about a class of ships -- we're building three of them. So, you don't have 50 or 60 to spread those, essentially, R&D costs over. The DDG=51, I think, is an example of that. It's now cheaper than it was when it was first -- in real dollars -- than it was -- I believe, than it was back in 1986. It had a whole lot of problems, and now it's the mainstay of the Navy.

So, we -- I think we -- again, I think this is a very important subject. I don't mean to sugar-coat it. And I think we need to focus on it. But, I think we need to understand the context somewhat and really focus on the real

problem, which seems to be, How do we deal with the quantitative risk? I spent 2 hours, not long ago, in a classified briefing on the new bomber. Same kinds of issues, and trying to hammer about, How do we do the contracts? Who takes the risk? -- whether it's the contractor or the government. And -- but, this is a tough problem when you're talking about trying to build the most technically advanced weapon system in the world. And Senator Manchin mentioned the Chinese. They're doing pretty well by stealing our intellectual property, he alleged. I alleged.

[Laughter.]

Senator King: But, you know, that's one way to shorten -- short-circuit the R&D. But, I hope you all -- and, Madam Secretary and Secretary Stackley, you've done a lot of thinking about this. I think it would be very helpful to present us with some thinking about how we deal with the first-in-class problem, because that's what we're talking about, across the government.

Admiral?

Admiral Manazir: Senator King, if I can offer -- this is more complex, from the technology risk perspective, than just whitewashing first-of-class. And that is, What technologies do you choose to put into the first-of-class? Secretary Stackley and others have said in their statements

the original plan with CVN-77 had part of it, CVNX-1 had part of it, CVNX-2 had part of it, all pushed into one class. We talked about -- I think Ranking Member Reed talked about the Enterprise Air Surveillance Radar Project that we're putting in the CVN-79 to replace the dual-band radar. That's a management of risk, because that radar is a non-developmental solution. We have created requirement sets that looks at what industry has now to reduce the risk of technology and development on time and schedule. The P-8 program -- brand new antisubmarine warfare aircraft was put on a COTS commercial system. That's the Boeing 737 aircraft. We reduced the risk of integration into an airframe by using something that was already proven, and we're realizing that risk. Several of our weapons programs, we use the back-end motor with a brand new seeker on the front. Very, very capable. When the seeker is good, we do the back-end motor later on.

So, the type of risk that you take on, sir, in the first-of-class is key. If we choose to do a full developmental first-of-class, like the Joint Strike Fighter, that is a revolutionary weapon system that is better than any aircraft in the world. There's a lot of risk there, sir, and we're realizing that risk now. We've talked about the Ford. That was revolutionary between the Nimitz and the Ford.

So, I would submit, sir, that Mr. Francis's comments are exactly on the mark. We have to look clearly at the risks that we have. If your first-in-class is revolutionary, and you don't do the things that you're talking about for technology, you're going to have a cost-delivery mismatch that you're going to have to deal with later on, sir. And we look at that risk.

Senator King: Well --

Mr. Stackley: If I may just add, because Senator Ayotte brought up the Ohio. You're asking a very -- you're just spot-on questioned an issue that we wrestle with continuously. Ohio is the next big thing coming our way in the Department of the Navy, in terms of a first-of-class. We're talking about a program that will be providing reliable, secure, certain sea-based strategic deterrence until the 2080s. So, how do you design and develop the capabilities that are going to go on that boat on the front end, deliver on schedule so that she can be on deployment, as scheduled, in 2031, certainly, and then, throughout its life, remain that secure sea-based strategic deterrent.

Senator King: Still be an effective weapon 50 years from now.

Mr. Stackley: Yes, sir. So, we're not going to go big-bang. We've been working this. We look at, What do we need to do on the Ohio replacement that we don't already do

on the Ohio? Well, right now we have a very effective high-performing strategic program, in terms of the weapon system, itself. We're not going to develop a new weapon system. We're going to port over the existing weapon system, in its current state of technology at the right time, onto the Ohio replacement hull.

The Virginia class, very effective combat systems, sensors, communication platform. We're going to port over that technologies onto the Ohio replacement hull. The advances that we need to make are in terms of stealth and survivability of the Ohio replacement hull for the next half-century. And that's where our focus is, in terms of development and design. And the way we're going about this is, we are challenging the requirements. You've got to get the requirements right, up front. And getting them right doesn't just mean, What does the operator need? But, what are the -- what is technically feasible? What are the risks that you carry in there? When you identify those, make sure that you've got a development program that works those risks so everybody understands, as you're making progress before you're cutting steel, and then have the off-ramps that we discussed. And so, in fact, we've got that laid out. That's a 2019 boat that we're sitting here today doing those developments, managing -- 2021, excuse me -- 2019 advanced procurement -- that we're managing closely today, and then

assessing the risk each step along the way, visibly, for the Congress, for the Department of Defense, with industry, to ensure that each step along the way, we have -- we're making the right decisions, and we don't find ourselves where we are today, with delay and the cost growth that we're seeing on CVN-78.

Chairman McCain: Admiral, when -- your time is expired -- when you use the Joint Strike Fighter as a success story, sir, you have lost the connection between the military and this committee. The most expensive, longest cost -- largest cost overrun, first trillion-dollar weapon system in history, and you're using that as a success story? Sir, you have lost connection with the members of this committee and those of us who have been involved in this fiasco for a decade.

Mr. Francis, you've got to respond to some of this. We are now being painted pictures, everything is fine.

Mr. Francis: I think that this is the byproduct, again, of culture and the long timeline. So, when programs get through their problems, we fall back on, "Wow, but so much better than what we have." But, we've forgotten the cost and the opportunity cost it took to get there. So, I think we could agree that the system produces tremendous weapon systems, but they cost way more and they take much longer. And we're giving things up along the way, but we

don't know what those things are. And that's not a pattern we want to repeat. We want to get it right the first time.

Chairman McCain: Senator Cotton.

Admiral Manazir: Mr. Chairman, just for the record, sir, I did not intend to use the Joint Strike Fighter as a success story, sir, as much as illustrate that innovative technology, such as Secretary Stackley said, is a challenge, sir. So --

Chairman McCain: Innovative technologies in Silicon Valley reduce costs. Innovative technologies, apparently, in the Department of Defense increase costs.

Senator Cotton.

Senator Cotton: Thank you.

I know that we've gone over a lot of the details of this program, so I won't rehash those, but I do, in the spirit of inquiry and problem-solving, moving ahead in the future, have a couple of simple questions that I want to ask.

Mr. Francis, I'll start with you. Has the Navy ever delivered a ship under budget and on time?

Mr. Francis: I don't know if I can answer that for history. I want to say, in the recent ones that we've looked at, that hasn't happened. But, probably Mr. Stackley has better data on that.

Senator Cotton: You --

Mr. Francis: The ones we've looked at, I haven't seen it.

Mr. Stackley: Yes, sir. First off, you said "a ship." And the answer is, absolutely yes, we do it consistently. I think what you wanted to get at is a lead ship, since we've spent so much of our time discussing lead ships. And the answer, again, is yes, we have. And that's when we have been very measured, in terms of the risk that we've carried into those lead ships. And, as we look forward, I -- talking about the higher importing over technologies -- when we look at the lead ships coming our way right now, the first one is going to be the TAOX, which is in the 2016 budget. We're going to leverage existing technologies and design to minimize the risk on that. And that'll be a fixed-price program.

The next one after that is going to be the next amphib program, what we refer to as the LXR. We have made the decision to mitigate -- minimize those risks to ensure that we deliver the capability that the warfighter needs at a cost we can both afford and rely upon when it delivers. We're going to reuse the LPD-17 hull form, which is technology and capability that we understand and supports the mission, and then we're just going to deal with those changes to the mission that are necessary for the changes to that platform's requirements.

Senator Cotton: So, those are ships in the future, though, retrospectively. What is the lead ship that --

Mr. Stackley: The --

Senator Cotton: -- the Navy delivered under budget and on time?

Mr. Stackley: I don't want to oversimplify this, but the last lead ship that we delivered was the Mobile Landing Platform. That delivered on schedule, under budget.

Senator Cotton: Okay.

Secretary McFarland, do you have anything to add to this question?

Ms. McFarland: No, sir.

I would add one thing different, though. I think the underlying premise, in terms of what we're having as a discussion, doesn't go specific to the ship for the first-in-class, but to that culture that we discussed earlier.

Senator Cotton: And to be clear, I'm asking this not just about the Ford-class carrier, but all these major capital investments that, in particular, our Navy and our Air Force have to make. If the Air Force were in front of me, I'd ask them the same thing about airplanes. But, you know, we have to replace our ballistic missile submarines, and Air Force is on the verge of replacing its long-range strike bomber.

So, the reason I asked the question is, I want to know

if we've done it in the past, even if it's been rarer than over-budget and delayed programs, what are the features or the best practices or the cultural conditions that allowed a program to be delivered on time and under budget?

Ms. McFarland: Senator, I would like to bring forward a list of programs that have come in on schedule and performance. And also, in terms of the culture, I think that was adequately discussed by the Chairman and Ranking Member, and I think the table here. There are thing is that can be done to improve things, like bureaucracy and things like overhead.

I think the other piece that you're getting at, in terms of, What have we learned? -- one of the attributes of our new implementation of WSARA and the better buying powers is taking lessons that come from GAO, from the DOD IG, from DOT&E, and incorporate it in very stepwise and disciplined into the system to work to see these improvements inculturated into our workforce for the long term. We've seen, as part of the performance of the acquisition systems reports that we started 3 years ago, a moderate improvement, a decrease of the Nunn-McCurdys, an increase of performance of our contracting, although we can improve an incentive. We have been trying to measure what we do, and find those faults, whether they trace to acquisition reform, policies, statute, regulation, to work, as we had done, with Congress

for these upcoming NDAAs and legislation. We believe we need to get to the heart of the matter, which is the data that points us to what we can do to improve.

Senator Cotton: Mr. Francis, do you have any --

Mr. Francis: Yes, Senator. One of the classic cases of a success story is the F-16 fighter. And I know that's -- it's old, but the story -- the lessons are still applicable. So, that was a low-cost alternative to the F-15. So, the requirements were kept low. We had five international partners, and they all had to agree to any requirements changes, which had the effect of keeping the requirements down. And we had a contractor at the time that was in very difficult financial straits, so they couldn't underbid and hope to get well later So, that combination of things had the effect of changing the culture for that program.

There are some other examples. I'm trying to think of -- the Shadow UAV that the Army developed also went quite well. And again, in that case, it -- we had both the head of requirements in the Army and the head of acquisition actually drove that program and kept it in check.

So, I -- I'm -- my experience suggests that the success stories have been the byproduct of exceptional circumstances and not the result of normal circumstances. So, the takeaway here is how to replicate that, how to make those

circumstances, that culture, normal for most acquisitions.

Senator Cotton: Would the uniformed officers have anything to add?

Admiral Gaddis: Yes, sir. I was PMA-265. I was the Hornet, Super Hornet, and Growler program manager. And, at my change of command, I said that I thought Super Hornet was the most successful program in the history of DOD.

Two years later, I found that I was wrong, because the 18G Growler beat the E/F Super Hornet. And I would argue that that's normal acquisition, and what you see is an aberration.

That, over there, is an aberration. I have a $47 billion portfolio with those platforms, and it includes E2D Advanced Hawkeye, it includes the next-generation Jammer. Very successful programs. That, right there, is the unfolding of one agonizing technical discovery after another. And at its root, since Senator McCain asked that question, is -- we didn't do it -- an adequate TD. In fact, let me give you some examples. EMALS -- we did a risk-reduction effort before signing the production contract, and we spent $322 billion. WSARA Act is passed in 2009. For next-generation Jammer, before we go to milestone B, the Department of Defense will have spent $622 million for tech-mat development and tech development for next-generation Jammer. What that means is, you're going to have a solid

technical baseline and a solid technical -- or cost estimate going into milestone B. I feel pretty confident about those -- execution of those programs.

AAG, we spent a $29 million. We could have discovered -- everything that we discovered then we could have discovered it a lot sooner. But, we're at a point in the program where we're beating back all the discovery, we're beating back all the design changes, we're into test. And, as Secretary Stackley said before, we're now into software and tweaking the software. But, that's where we're at with AAG.

I wish we had done TD like we did next-generation Jammer as a result of WSARA Act and what we did with EMALS. We just didn't do it. And in 2004, by the way, normal acquisition, we did propose that. We did propose a 5-year component advanced development program followed by a 5-year development program. And it was deemed as too costly and too lengthy. Well, here we are. We should have done that in the first place, but the leadership said no, because we were into transformation pushing technology to the left. But, that's the consequences of those decisions that were made back in 2004, which, by the way, is all documented in the 2004 acquisition strategy.

Thank you.

Senator Cotton: Well, thank you, Admiral Gaddis, for

that perspective.

I would, if you could, follow up on providing examples of where systems have succeeded. They've been a success story, they come in under budget, they come on time. The headline grabbers are the lines, like this one or like the Joint Strike Fighter, that don't do that. But, I do think that we have a lot of lessons to learn, not just on oversight of current or past products, but what's going to happen in the future for the platforms and the weapon systems that our sailors, soldiers, and airmen, marines, need to fight and win our wars for the future. So, that would be very helpful for me and for the rest of this committee, I'm sure.

Thank you very much.

[The information referred to follows:]

[COMMITTEE INSERT]

Senator Reed [presiding]: Thank you, Senator Cardin.

On behalf of the Chairman, let me recognize Senator Kaine. He has one question.

Senator Kaine: Thank you. Thank you, Mr. Chair.

And super questions by Senator Cotton.

In this program, going back to a point I asked earlier -- and I'm -- I want to get your opinions on the role we should play in, sort of, oversight. In this program, the cost estimates before 2010 were coming with a confidence factor of less than 50 percent or, in one instances, less than 40 percent. If we're being asked to make a decision about a significant acquisition, and we're given a cost estimate, but the Navy, or whatever the service branch, says, "And our confidence on this cost is less than 50," to me that suggests probably some questionable confidence on cost, but also even on operational risk, because the reason you have a question about cost often then connects to an operational uncertainty, as well. Should we just say, "Come back to us when you're at 75, or come back to us when you're at 60?" If there's that much uncertainty about a cost estimate, should we, basically, push you to do more work before we give a green light?

Mr. Stackley: Sir, I spend a lot of time with the cost estimators and a lot of time with the program managers, and I explained the cost estimate is not the answer. The cost

estimate is information. And you hit on two things: the cost estimate and the percent confidence. In fact, the estimators come up with a range of things that could influence the final cost. What I want the program management team and the cost estimators to do is, in that, understand what are the risks. If today the confidence is 40 percent, what are the risks that we have to drive out of the program to get it up to the level that we're ready to put budget down on, ready to go to contract, ready to cut steel. And so, it's not just the cost estimate, it's the next two or three layers below that that the estimators are pointing at that identify the risks that we need to retire, just like we're been discussing here, all the parts of the carrier program, that we need to retire before we go to contract, before we go to Congress and say, "We need authorization and appropriation to go forward on this major program."

Mr. Francis: Senator Kaine, I would say, for you, you have to start your work earlier. So, when you come up to a milestone, and the cost estimate's done, and the program's acquisition strategy is laid out, there's very little you can do. But, I think, with Congress and this committee, by getting invested in programs earlier, say 3 years before that milestone, you create the expectation that you want that to come in at a high confidence level, you want the

risks identified, and you're willing to either, one, pay for the risk reduction, like Admiral Gaddis talked about, or you're willing to offload some of the requirements to bring the system down. But, the work would have to start earlier to position it for success.

Senator Reed: Well, thank you very much.

Thank you for your extraordinarily interesting and insightful testimony, and for your service to the Nation.

On behalf of Chairman McCain, I'll adjourn the hearing.

Thank you.

[Whereupon, at 11:41 a.m., the hearing was adjourned.]