

HEARING TO RECEIVE TESTIMONY ON TACTICAL AIRCRAFT PROGRAMS IN REVIEW OF THE DEFENSE AUTHORIZATION REQUEST FOR FISCAL YEAR 2014 AND THE FUTURE YEARS DEFENSE PROGRAM

WEDNESDAY, APRIL 24, 2013

U.S. SENATE,
SUBCOMMITTEE ON AIRLAND,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

The subcommittee met, pursuant to notice, at 3:04 p.m. in room SDG-50, Dirksen Senate Office Building, Senator Joe Manchin III (chairman of the subcommittee) presiding.

Committee members present: Senators Manchin, Blumenthal, McCain, and Wicker.

Committee staff member present: Leah C. Brewer, nominations and hearings clerk.

Majority staff members present: Creighton Greene, professional staff member; William K. Sutey, professional staff member; and Bradley S. Watson, special assistant for investigations.

Minority staff members present: Ambrose R. Hock, professional staff member; and Anthony J. Lazarski, professional staff member.

Staff assistant present: John L. Principato.

Committee members' assistants present: Mara Boggs, Patrick Hayes, and David LaPorte, assistants to Senator Manchin; Paul C. Hutton IV, assistant to Senator McCain; Todd Harmer, assistant to Senator Chambliss; and Joseph Lai, assistant to Senator Wicker.

**OPENING STATEMENT OF SENATOR JOE MANCHIN III,
CHAIRMAN**

Senator MANCHIN. The subcommittee will come to order and thank you for being here. We want to apologize. Senator Wicker and I were both together at a briefing that we attended and we appreciate your understanding.

I want to welcome, extend a welcome to and thank each of our witnesses for appearing before this subcommittee today. This is my first hearing as a subcommittee chairman and, although he has served for a number of years on the Armed Services Committee, this will be Senator Wicker's first hearing as the Airland Subcommittee ranking member. Senator Wicker, I am really looking forward to working with you on the subcommittee this year.

On behalf of the committee, I want to thank you each of you representing the men and women of our armed services for the won-

derful jobs that they are performing in Afghanistan and around the world. We keep all those who are serving in our thoughts and prayers every day.

Every year we are challenged to make decisions balancing a number of competing demands of resources, including resources for current operations and investments in future modernization. In this case we will be assessing plans and programs regarding the current status and future prospects for tactical aviation programs. Complicating things this year is sequestration, which, if Congress does not act to change things, could lead to significant consequences for our current readiness and future modernization.

We meet today to talk about the F-35 Joint Strike Fighter, the JSF, program and other tactical aviation programs. We all know that the JSF program is central to the long-term modernization plan for the Air Force, Navy, and Marine Corps for more than 15 years now. Given that fact, any change in cost, schedule, and performance of the JSF program really sends shock waves throughout the Department and raises many questions of achieving that balance between the demands of maintaining readiness in the near term and those of modernizing for tomorrow.

For instance, the Government Accountability Office has estimated that extending the service lives of existing F-16 and F-18 aircraft would be approximately \$5 billion. Today we will seek a better understanding of implementation of the corrective actions the Defense Department has identified in the Joint Strike Fighter program after the Nunn-McCurdy certification three years ago and what levels of risk remain in the development and fielding program.

General Bogdan, I know there were a couple of engine-related problems since last year and, while we are always concerned any time that we hear about engine problems during the research and development stage, I understand that you have identified the problems and have mapped a way ahead to minimize the effect of the problems on the testing and development program. I hope you will discuss these programs and solutions during your testimony.

In addition to the more immediate acquisition issues, we also know there is significant concern about how much the F-35 is going to cost to operate during its life cycle. We do not have the new selected acquisition reports, or the SARs, for major defense acquisition programs yet this year, but last year the Department was predicting the F-35 life cycle cost over 50 years would be approximately \$1 trillion. That is a large mountain of cost and I hope that we can gather some insight today on what the Defense Department is doing to try to reduce those costs.

In addition, today we want to focus on a number of issues, but primarily we want to understand how the Department has been executing to the baseline for the F-35 program since last year, how the services are refining their responses to the Joint Strike Fighter delays that emerged two years ago, and what effects those delays may have on our forces.

Today we are going to hear from: Lieutenant General Christopher Bogdan, the JSF Program Executive; Vice Admiral Waller M. Skinner, Principal Military Deputy in the Office of the Assistant Secretary of the Navy for Research, Development, and Acquisition;

and Lieutenant General Charles R. Davis, the Military Deputy for the Office of the Assistant Secretary of the Air Force for Acquisition.

There are worrisome prospects for the future of tactical aviation programs, particularly in terms of having the numbers of aircraft that we need to keep from hollowing out our tactical aviation forces. We've been following your progress in trying to mitigate to close those gaps.

There are a number of other issues that we may discuss, but in the interest of time I will stop here. Again, I want to thank our witnesses. I look forward to hearing your testimony.

I would now like to recognize Senator Wicker, who will give his opening statement and ask questions.

Senator Wicker.

STATEMENT OF SENATOR ROGER F. WICKER

Senator WICKER. Thank you, Mr. Chairman. Thank you for holding the hearing. Thank you for your kind words of welcome to the subcommittee. And thank you to our three witnesses today for your selfless service to our Nation. I look forward to your testimony.

Senator Manchin, I also want to take a brief moment to congratulate you on your appointment as chair of the Airland Subcommittee. Our subcommittee responsibilities are immense. They include programmatic and budget oversight of most Army and Air Force programs, as well as oversight of the Navy and Marine Corps tactical aviation activities. As ranking member I look forward to working with you to ensure that our Armed Forces remain the best trained, best equipped, and most professional fighting force in the world.

I would like to begin by saying that I remain deeply concerned about the fiscal year 2013 defense authorization conference committee decision, made behind closed doors and without consultation of all conferees, which enabled the Air Force to begin implementation of its total force plan. I am convinced that some elements of the TFP were shortsighted and may adversely impact our intra-theater airlift capability at a time when our Services are evolving toward a more rotational deployment model.

Similar to our committee's bipartisan efforts last year, I look forward to working with the chair on initiatives to help ensure the Air Force makes its force structure decisions based on the best possible understanding of long-term global force requirements. These decisions should not be based solely on self-imposed resource constraints.

Now, as to tactical air superiority, our military has fought four major regional conflicts over the last 22 years—Kuwait, Bosnia, Afghanistan, and Iraq. America's security challenges continue to persist across the globe, from the defiance of a volatile and dangerous dictator in North Korea to the scourge of transnational terrorism that persists in sub-Saharan Africa. Effectively dealing with our current and potential adversaries means we must be prepared to act across the continuum of conflict, from lending humanitarian assistance in the wake of natural disasters to combating terrorism and cyber attacks, and we must be ready to fight and win a high-

end conventional war against a nuclear-armed foe. Air power will no doubt continue to play a central role in our National security.

Since 1953, no U.S. ground personnel have been killed by an attack from enemy aircraft. That is a success story. America's superiority and dominance in the air protects our homeland, deters potential adversaries, and ensures that our joint and coalition forces never have to question whether the aircraft flying above them is friend or foe.

However, our air dominance is being challenged. Both Russia and China are currently fielding fifth generation fighters. Like our ground forces, America's combat air assets are worn out and spread thin after two decades of deferred modernization programs and curtailed purchases of key platforms.

The service lives of many of these aircraft now extend beyond 30 years, in some cases well beyond 30 years. These extensions come at a price. Extending the lives of legacy aircraft means increased operations and maintenance costs, as well as decreased technical superiority gaps.

America must continue to be able to deter or defeat any threat, be it an asymmetric threat from a terrorist organization or a conventional challenge from a near-peer competitor. To do so we must be able to modernize and sustain our military, including our tactical aircraft. We cannot continue to kick the modernization can down the road, and I hope we agree on that, Mr. Chairman.

Successfully modernizing means we must be cognizant of the negative impact of the overly expensive and slow acquisition process we currently have. We must find ways to deliver new and innovative systems on time and on budget. Changing the system will require the combined efforts of Congress, the Department of Defense, and industry.

Specifically, number one, DOD must get its acquisition process in order by defining program risks up front, setting realistic requirements, adequately prioritizing research and development, and leveraging the power of competition.

Number two, DOD's industry partners must submit realistic contract proposals and be held accountable to their contractual obligations.

Three, Congress must uphold our responsibility to provide timely and adequate funding for key acquisition programs to help ensure predictability and long-term affordability for DOD and our foreign government partners.

Let me conclude by observing that national defense is solely a Federal responsibility, but it requires assistance from all levels of government and civilian industry. We need our States to maintain or implement business-friendly policies that will encourage the industrial base to grow and add high tech manufacturing jobs. We need defense companies to meet their contractual obligations to the taxpayer by delivering products on time and on budget. And finally, we need better cooperation and transparency between the Executive Branch, the Defense Department, and us in Congress, in order to ensure all parties fully understand our National security challenges and the means our military leaders require to meet them.

I hope our witnesses today will elaborate on their assessment of the long-term impact that reduced defense spending will have on

our industrial base and our ability to acquire new tactical aircraft on time and on budget.

Thank you very much, Mr. Chairman.

Senator MANCHIN. Thank you, Senator Wicker.

I think at this time, Senator Wicker, I know that you have got to—we'll go back to regular order then, if we can. We'll start with brief comments from our three presenters today, if you will. General Bogdan, if you would like to start, we'd like to hear from you.

**STATEMENT OF LT. GEN. CHRISTOPHER C. BOGDAN, USAF,
PROGRAM EXECUTIVE OFFICER, F-35 LIGHTNING II JOINT
PROGRAM OFFICE**

General BOGDAN. Thank you, sir. Chairman Mankin, Senator Wicker: Thank you for the opportunity to address this committee regarding the F-35 Lightning.

I first came to the F-35 Joint Program Office in August 2012, serving as the Deputy to the then-Program Executive Officer, Vice Admiral Dave Venlet. On 6 December 2012, I took over as the Program Executive Officer from Admiral Venlet, who left me a program that was well on its way to getting its legs back underneath.

Despite a turbulent past, the F-35 program is making steady progress today. This progress may not be as fast as you and I may like, but the size and the complexity of the program do contribute to this inertia. I hope that I'll be able to leave you today with an understanding of where the F-35 program is, where it is headed in the future, and what we are doing to ensure its success.

Today the program continues to make slow but steady progress and is moving forward in a disciplined manner. Let me highlight a few of the program's accomplishments in 2012. We conducted the first in-flight weapons releases from both the F-35A and B last year. We stood up our first operational F-35B squadron at Yuma Marine Corps Air Station. Additionally, the program began edge-of-the-flight envelope testing to the aircraft's maximum speed and altitude, and we also began our high angle of attack testing, all of which to date has been very successful.

The program also successfully completed a U.S. Air Force operational evaluation, clearing the way for them to begin pilot and maintenance training at Eglin Air Force Base. Additionally, the cost of producing the F-35 continues to come down for each successive lot of airplanes. For example, Lot 5 airplanes cost 4 percent lower than the previous lot 4 airplanes, and we expect such reductions to continue.

While the program has continued to progress, there are still challenges and risks ahead. The biggest technical concern on the program is the development of software. Although most of the basic coding of software is complete, the integration of this software, linking all the systems on the airplane together, still has a ways to go.

Over the past two years, the program office has implemented many changes in the way software is developed, tested, flight tested, measured, and controlled by the program office. These changes are beginning to have a positive effect, and as a result we are moderately confident that the program will successfully release our Block 2B and our Block 3I capabilities in 2015 and 2016. Our Block

2B capability is our initial combat capability, which we believe the U.S. Marine Corps will potentially use to declare IOC in 2015.

However, there is more risk to the delivery of our final block, known as Block 3F, which is the services' full warfighting capability. We intend on delivering that by the end of late 2017 and there is some risk there.

The program office will be conducting a Block 3 critical design review this summer and that, coupled with at least six months of flight testing of the current 2B software, will allow the Department to assess the likelihood of meeting the Block 3F final capability requirements in 2017. I will have a better answer for this committee and for the enterprise by the end of the summer about how likely it is to meet that final block of capability.

Other technical risks we continue to monitor include the helmet-mounted display system, lightning protection, the tailhook, the fuel dump system, and the maturity of our autonomic logistics information system, known as ALIS. The program office has been working with the contractors and the Navy and the Air Force systems commands to arrive at solutions for all these issues.

Affordability remains the Department's and my number one priority. The program office must execute the development program with discipline to ensure it can be completed within the time and the money we have been given. The Department must also continue to drive the cost of producing F-35s down and continue to attack the long-term life cycle costs of the F-35 weapons system.

Let me tell you a few things the Department is doing today to ensure that in the long run this aircraft is affordable. First, we've been studying all areas of sustainment to identify areas for cost reduction in what we call our business case analysis. We will continue this analysis through the summer and I will report those results when it is completed.

Second, the program office intends on injecting competition into various portions of the overall sustainment effort. We conducted an industry day in November 2012 to see if there were both domestic and foreign companies that had the capacity, the capability, and the desire to compete for various sustainment areas, including managing our global supply chain, producing support equipment, operating our training centers, and administering our ALIS system.

Additionally, the program has instituted a robust reliability and maintainability program that is systematically identifying all the parts and systems on the aircraft that today require repairs all too frequently, and the Department is standing up its organic depots to improve the quality, throughput, and turnaround times for parts repairs. The Department is committed to doing everything it can to drive the cost of sustaining the F-35 down to a level that is considered affordable by all the services, the partners, and FMS customers.

In summary, I believe the basic F-35 aircraft design is sound and the program office can deliver on our commitments. As in any complex development program, there are still challenges and risks ahead. I intend to continue to lead this program with discipline, transparency, and accountability and we will continue to drive costs out of this program.

Thank you again for the opportunity to discuss the F-35 and I look forward to answering your questions.

[The prepared statement of General Bogdan follows:]

Senator MANCHIN. Thank you, General.
Now we'll hear from Admiral Skinner.

STATEMENT OF VADM W. MARK SKINNER, USN, PRINCIPAL MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION

Admiral SKINNER. Chairman Manchin, Senator Wicker: Thank you for the opportunity to appear today before your subcommittee to discuss the Department of the Navy's aviation programs. On behalf of the Department of the Navy, I thank you and all members for your steadfast support to our Navy and Marine Corps who are meeting the Nation's commitments around the world. I propose to provide a brief statement and submit a separate formal statement for the record.

The Navy-Marine Corps team is forward deployed and forward engaged performing missions around the globe. Today naval aviation components are in the skies of Afghanistan protecting troops and Afghan civilians on the ground, providing intelligence, surveillance, and reconnaissance off the coast of Korea, over the Sea of Japan, the Persian Gulf, and the Horn of Africa, and they are providing maritime security along the world's vital sea lanes, and standing as a force of deterrence to those who would do harm to our Nation or our Nation's interests.

In support of the defense strategic guidance, we are also developing and recapitalizing to support the President and the Secretary of Defense's strategic priorities to rebalance to the Pacific, to ensure we provide the capability and the capacity to maintain an important presence in this region today and for the foreseeable future. We continue to assess and reshape our naval aviation plan to reflect the priorities of this defense strategy, with the reality of fact-of-life top-line reductions consistent with the Budget Control Act of 2011. As such, this year's aviation and strike weapons plan strikes a balance between capacity, capability, affordability, and maintainability of the industrial base.

To fulfill our Nation's commitments and strategic priorities, the Department of the Navy's 2014 aviation budget request includes funding for research and development and procurement of 165 aircraft and more than 2,400 strike weapons. We have important work to do to close out-year capability gaps and risks. In doing so, however, we are working to deliver the full capability and capacity that our warfighters need in an affordable manner.

For example, we are increasing implementation of new cost reduction initiatives, like competition and early standup of depot maintenance, striving to use multi-year procurement strategies and strengthening an acquisition workforce culture to ensure we provide the best return on investment and be the best possible stewards of the taxpayer's moneys.

Ultimately, we recognize that as we balance requirements, manage the increasing pressure to our top line, and factor in industrial base considerations, it is ever more important that our naval aviation programs closely align with not only the priorities outlined in

the new defense strategy, but that government and industry continues to work together to increase efficiencies and improve affordability to support our current forces and help us build the future force of naval aviation.

Mr. Chairman, thank you for the opportunity to appear before your subcommittee today and I look forward to answering your questions.

[The prepared statement of Admiral Skinner follows:]

Senator MANCHIN. Thank you, Admiral Skinner.

Now we'll hear from General Davis.

STATEMENT OF LT. GEN. CHARLES R. DAVIS, USAF, MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION

General DAVIS. Chairman Manchin, Senator Wicker, distinguished members of this committee: I do appreciate the opportunity. I know your time's precious here and I really look forward to being able to give you a quick update on Air Force combat aviation programs.

Today your Air Force proudly provides this Nation the ability to surveil and, if required, strike any spot on this planet, while defending our borders and protecting our allies. It is in this environment of fiscal uncertainty our focus remains on our five core missions of air and space superiority; intelligence, surveillance, and reconnaissance; rapid global mobility; global strike; command and control, and that's by which we deliver global reach, global power, and global vigilance.

I will remind everyone that just a short time ago we put B-2s over the bellicose nation of Korea and it was interesting to consider how they were probably sitting in their homes feeling that they had absolutely not a thing they could do about it during that period of time. That's the type of capability we want to be able to continue to deliver with your U.S. Air Force.

In 2012, though, however, Air Force global precision attack aircraft flew over 28,000 sorties and 41,000 hours in support of overseas contingency operations. In support of these operations, our intelligence, surveillance, and reconnaissance airmen provided intelligence that shaped combat plans for 33 named operations, enabled the removal of 700 enemy combatants from the fight, and built awareness for coalition forces in over 250 troops and contact engagements. Air Force Special Operations personnel executed over 1,600 strike missions and 7,700 specialized mobility missions.

On the home front, Air Force fighter, air refueling, and early warning aircraft have flown almost 64,000 total sorties supporting Operation Noble Eagle since September 11, 2001. As a testament to our total force, the Air National Guard and Air Force Reserve have flown more than 65 percent of these Operation Noble Eagle sorties and the Air National Guard today currently operates 17 of 18 air space control alert sites across the United States.

The fiscal year 2014 budget attempts to retain this critical force structure and maintains the Air Force ability to rapidly respond to global mission demands. It evolved from a concerted effort to balance risk, modernization, and force structure reductions with a commitment to readiness and taking care of our people. Yet there

is still considerable uncertainty in the fiscal year 2014 Air Force top-line level.

The 2014 budget will not reverse the damage done by the fiscal year 2013 sequestration. Recovering the warfighting capability that we lost and improving readiness will certainly require some reduction in operations tempo and-or additional resources. Reduced flying hours will cause some units to cease flying operations, resulting in severe, rapid, and long-term combat readiness degradation. Today, for the first time I can remember, we have 12 squadrons, bombers and fighters, that will not fly for the rest of the fiscal year. It's about 18 percent of our flying hour, a 200,000-hour flying cut, by the end of the year.

Cuts to the Air Force modernization programs will over time cost the taxpayer more money. Sequestration will not save the Air Force money. The resulting program inefficiencies and lost quantities will raise remaining unit costs and delay delivery of validated capabilities across our forces.

Yet, despite some of these ongoing budget concerns, many of our fighters and weapons programs do have enhancements planned for 2014. These include the A-10, F-15, F-16, F-22, and AMRAAM weapons systems. For example, we will modernize a portion of our legacy F-15 and F-16 fleet with advanced radars, countermeasures, and additional situation awareness systems.

But I have to caution you on how we use the context "modernize" in this discussion. These new systems and enhancements really only bring capabilities and technologies that have been in existence for years and in some cases fielded to our legacy fleet.

More troubling to me is that half of our so-called "modernization" budget really goes just to maintain current capability in the light of decreasing performance of these systems and adds really no new capability. We are in a situation today where primarily we are reacting to threats outside of our Nation to try to keep our systems at least on par with those. We are doing very little to bring new systems on right now to be able to stay in front of that threat and make the threat react to us. As an airman and a student of air power, I realize very plainly that the last thing we want somebody that conducts air space and air power to be is predictable, because if you become predictable you just become a target.

So we have to be very careful as we navigate this uncertain way ahead to mitigate risk in critical areas like readiness, force structure, and modernization. We will continue to work with you and all the congressional committees to develop executable options. But personally I worry that our end result budget issues will threaten our ability to recapitalize our aging fighter and bomber fleets.

We must be mindful of the fact that one nation that plays prominently in our defense strategy recently flew two brand-new advanced prototype aircraft within just a 22-month period. In times of robust budget, this took us about 9 years.

Nonetheless, our objectives are to remain as ready as possible today, set a course for full-spectrum readiness, preserve a highly responsible and scaleable force, and overcome force structure and modernization challenges to provide the Nation with the world's most capable Air Force now and in the future.

Thank you for these minutes and I look forward to your questions.

[The prepared statement of General Davis follows:]

Senator MANCHIN. I want to thank all three of you for your presentation, and without objection all prepared statements will be made a part of the record.

With that, I will turn it over to Senator Wicker for his questions.

Senator WICKER. Thank you very much.

General Bogdan, let's start by talking about U.S. defense exports to our allies. I've been a big supporter of this. I believe robust defense trade increases interoperability with our allies and reduces unit costs and it helps support U.S. defense industrial base. I think it's a fact that we have ten partner countries that are slated to receive the F-35 deliveries in the coming years: the United Kingdom, Turkey, Australia, Italy, The Netherlands, Canada, Norway, Japan, Denmark, and Israel.

To what extent, General, have you kept our foreign partners informed and engaged as to the JSF program status and schedule?

General BOGDAN. Sir, our partners and our FMS customers are a vital part of the program, as you said, not only from the aspect of reducing costs to the U.S. Government, but the synergistic effect of having our allies flying the same airplane with us in the future with the same tactics and the same capabilities, that's priceless in some ways.

It is difficult sometimes to ensure that information flow through the Joint Strike Fighter program gets to everybody in an equal manner. It is difficult. What we do today in our program office is we have—each of the eight partner countries has a deputy national director who is located in the program office and they are part of our everyday operating procedures in the program office. We meet every day at 8:15, all of us, the leadership team, and they're included.

Our FMS partners today, which are Japan and Israel, they have personnel who are located in Crystal City near where the JPO is, and once a week we meet with them to have discussions with them also.

Probably the greatest challenge, however, sir, with our partners and something that is going to require a lot of effort in the future is, as our partners begin to produce—as we begin to produce and deliver airplanes to them, they need the information about the airplane that we in the United States have, and transferring a lot of that information to our partners is difficult because at times some of our ITAR restrictions prevent us from getting that information to them.

Senator WICKER. For the record, tell us what "ITAR" means?

General BOGDAN. International Trafficking in Arms Regulation. Generally, the State Department has the purview over what can and can't be released, especially relative to industry.

But as I was saying, probably the most difficult thing on the program right now having to do with the partners—and I think if they were here they would tell you—that access to information about the airplane and about the weapons system, because previously it had been marked U.S.-only, when it probably should have been marked differently, is an impediment to the program today.

Senator WICKER. That decision to mark it as such was made by the State Department?

General BOGDAN. Well, in most instances no, sir. The internal paperwork on the program was initially marked based on what Lockheed believed to be the appropriate rules for marking that paperwork. As we move forward in the program, we have recognized that I think both the JPO and Lockheed were being overly conservative, because there is information that we have to release to our partners now. We are systematically going back and fixing that.

Senator WICKER. Well, it's obvious you're working with our partners. Let me ask you about three. Canada, Italy, and The Netherlands have reduced their projected buys, am I correct?

General BOGDAN. That's correct, sir.

Senator WICKER. What was the issue there? Assuming that we can get no new buyers, how much would the cancellation of say one foreign sale of an F-35 affect the unit cost for our government?

General BOGDAN. We'll take Italy for an example, sir. Italy was originally planning on buying somewhere upwards of 140 airplanes. After the U.S. Department of Defense decided to flatten out our ramp rate over the last three years and remove 149 of our airplanes from the forward portion of the buy to the back end, Italy reduced their buy from 140 down to 90 airplanes.

That has an impact on the unit cost of each and every airplane that we all buy, whether it's Italy or The Netherlands or the three Services. So the partners play an important role in keeping the production level of this program up.

The Canadians similarly are relooking at the process that they used to determine whether they should have selected the F-35. It's not so much that they are disputing whether the airplane is good for them or not. It's the process in which they came to that conclusion.

But more to your point, sir, it is vital, it is vital, for us to keep the partners in this program. Without their support and without them buying airplanes—and our partners without the FMS customers are going to buy somewhere on the order of 660 airplanes. Any one of those partners pulling out of the program will have a negative effect on how much it costs the services to buy airplanes, and then there's the potential for what we call the death spiral, where you want to buy airplanes but someone drops out and the price goes up, so you can't buy as many, so now because you can't buy as many the price goes up again, and you continue on that spiral until you get to a point where you can't buy nearly as many airplanes as you wanted.

Senator WICKER. Why don't we say this: You'll take for the record my sub-question about the unit cost—

General BOGDAN. Yes, sir.

Senator WICKER.—about each sale affecting the unit cost.

[The information referred to follows:]

[COMMITTEE INSERT]

General BOGDAN. I can get you that information.

Senator WICKER. How are things going with Singapore, General?

General BOGDAN. Singapore has shown tremendous interest. Every time I see anyone from the Singaporean Air Force, I can tell

you that they are quite enthused about the airplane. I believe by this summer we will hear if Singapore is in the program.

Senator WICKER. And South Korea, sir?

General BOGDAN. South Korea should make their decision by June of this year. They were originally scheduled to make their decision on three different airplanes that they were looking at in December. They extended that for 6 more months and we would expect by June to hear about what their decision is. We're cautiously optimistic.

Senator WICKER. General Davis, that country you referred to, that's China, wasn't it?

General DAVIS. Yes, sir, it was.

Senator WICKER. Okay.

Now, on the cutback of 18 percent of our training flights, that is a function of 9 percent being jammed into 6 months, am I correct?

General DAVIS. And, sir, that was 18 percent of our total flying hours, not just training hours.

Senator WICKER. Total flying hours.

General DAVIS. And that was the direct result of the sequestration 9 percent cuts.

Senator WICKER. Thank you for clearing that up.

When we get to next year, is spreading it across 12 months going to ease that up a bit for us?

General DAVIS. Sir, our 2014 President's budget is roughly flat compared to 2013.

Senator WICKER. But in terms of the flying hours?

General DAVIS. Well, sir, that's what I'm trying to get at. Because some of our investment programs start to grow in 2014, we will have to continue within the Air Force to figure out how we balance modernization with readiness. If we assume that that budget stays intact with no effect of the current Budget Control Act, we will be able to buy back a lot of those flying hours because we'll not have to pay that bill. So a lot of those training hours, a lot of those lost sorties, a lot of those combat squadrons that are no longer mission capable will come back. So we'll have to just assume to be able to get there that we get the full President's budget request for 2014.

If we have to deal with anything else in 2014, we'll have to work that on a real-time basis.

Senator WICKER. Let me squeeze in, General Bogdan, the hacking of our U.S. computer networks by the Chinese. How confident are we going forward about our ability to secure classified and sensitive data within these programs?

General BOGDAN. Sir, I will tell you within the Department of Defense and within the Joint Strike Fighter program, I think over the last few years we have implemented some fairly robust procedures to keep F-35 data within the confines of the Department. I am a little less confident about our industry partners, to be quite honest with you.

I can tell you from our partners' standpoint, they recognize the huge responsibility that they have with the fifth generation technology that we're giving them, and each and every partner I know is taking security to the same level that the Department of Defense is. So I would tell you on the partner side and on the U.S. services

side I'm pretty confident that we have a robust layered system in place to prevent that. I would tell you I'm not that confident outside the Department.

Senator WICKER. Tell us what you need to help you work with industry on this, and thank you for your service.

General BOGDAN. I will take that for the record, sir.

[The information referred to follows:]

[COMMITTEE INSERT]

Senator MANCHIN. Thank you, Senator.

At this time we'll hear from Senator Blumenthal.

Senator BLUMENTHAL. Thank you all for being here today and thank you for your extraordinary service to our country in an area that is critical to our national security.

If I may, General Davis, I think if I have it correctly you outlined that the Air Force is about 200 fighter pilots short of your total manning requirement. Am I correct in that recollection?

General DAVIS. Sir, that number is correct.

Senator BLUMENTHAL. And could you explain to us what you view as the primary causes for that shortfall, if I may refer to it that way, whether it's recruiting and retention or funding for training or where you see the causes are?

General DAVIS. Sir, in short it is the direct result of drawing down force structure. Now let me explain. The airmen in your Air Force bring a wide variety of expertise, not only in flying fighters and bombers, but also in command and control of the air in defense of everything. So we have very specific billets all throughout the Air Force that requires that expertise that a fighter pilot either learned from operational deployments, brought from weapons school as our premier instructors, or something.

So we depend on their expertise to do a lot of fairly important jobs throughout the Air Force: running air operations centers, helping command and control battles. So as we draw down force structure and cockpits become less available, we have no ability to absorb these individuals out of pilot training, put them into a fighter squadron, get them some experience so that they are now useful in an air operations center over in the Middle East. So as a result, it perpetuates itself. If we can't bring them in, we can't fill the slots and the shortfall continues to grow.

So again, it goes back to what we're able to fly and how many cockpits we're able and how much training opportunity we're able to give these individuals.

Senator BLUMENTHAL. So if I can put it in terms that might be understandable to the average American, not that your explanation hasn't been absolutely clear, but if I were giving it to the Rotary Club, we're not providing enough aircraft for training, enough slots where our pilots coming out of schools can have the kind of useful experience that gives them the ability to be sufficiently expert in the air to have them fly for us?

General DAVIS. Senator, that's exactly right. It's a matter of getting them expertise so they can contribute to the battle.

Senator BLUMENTHAL. Are you—I heard what you said about that other country, which we now know is China, and I wonder if you could expand on that a little bit? What exactly have they done within this short period of time that you cited?

General DAVIS. Sir, within about 22 months they flew variants—and we can all debate the relevancy of those two airplanes—the J-20 and the J-31, which were essentially, if you look at them, they look very much like a version of the F-35 and very much a version of the F-22. You asked General Bogdan about hacking networks. There's no doubt that a large amount of our unclassified data probably made it into those designs in some shape, form, or fashion.

But I mean, the fact that that country could find the resources and the engineers to build two prototypes, two flying high performance aircraft prototypes, in 22 months—and if you look a little bit further within the intelligence, it wasn't just those two airplanes. They flew a variety of airplanes in about a three-year period, to include an airlifter which looked very much like our C-17, a helicopter, and other training aircraft.

So they have shown that they have acquired the beginnings of a little bit of agility within the acquisition system that we need to be mindful of, because, while we may think we're comfortable and able to do things as we please, we're seeing that other countries that we didn't care too much about in how they produced weapons are starting to show that they have capabilities. And that's why I brought that up.

Senator BLUMENTHAL. I appreciate your raising it with us, and I find it somewhat alarming that the keystone to our air superiority for the next decades can be so easily, in effect, reproduced, which is probably a polite way of putting it, by the Chinese in so short a period of time. Should I not be reacting that way to what you've just said?

General DAVIS. Sir, I think we all need to be mindful of the fact that they can go produce airplanes of a fighter, if you will, variation in a short period of time. I would caution the fact that probably the underpinnings behind that shell that you see flying around may not be anywhere near the capabilities that General Bogdan will bring with the F-35 or what we have with the F-22 or the F-18E/F.

But I mean, just the fact they can produce and deliver prototypes. There was a period in our time where we had nine different X-plane variants sitting on the ramp at Edwards Air Force Base at the same time. We produced 30-something X variants between 1947 and 1987 roughly. So now we've kind of set back on our laurels and built some very exquisite, very capable designs that are going to dominate the air, I have no doubt. But we now have another country that I think we need to pay attention to a little bit differently than we have in the past.

Senator BLUMENTHAL. So they right now, they have reengineered or managed to in effect reproduce the shell at least, but we don't know whether the flying capabilities and the attack abilities are commensurate with what we would regard the F-35?

General DAVIS. Sir, that would be my personal opinion of how I'd characterize that.

Senator BLUMENTHAL. Thank you.

Thank you, Mr. Chairman.

Senator MANCHIN. Thank you, Senator.

I just have a few questions and then Senator McCain has joined us.

I'd like to ask each of the witnesses how will implementing the reductions from sequestration affect each of your programs? I think we've heard an overture on both of that. I might ask, how would you be able to manage these adjustments if you had flexibility? That's a big word we're all using on both sides of the aisle, Democrats and Republicans. But basically still meeting the goals of the cuts that have to be made, but doing them with some discretion that you might have and flexibility, if that would help you? If anybody can speak to that, whoever wants to start? General Bogdan?

General BOGDAN. Yes, sir. Flexibility would be a wonderful gift for the F-35 program. If the sequestration were to take place precisely as it was defined across the board, my program would have problems. I would lose money in development and that means that I may not be able to deliver the capability that the warfighter needs on time. I would lose money in production, which means we will lose airplanes in fiscal year 2013, which has an effect on all the remaining airplane prices in 2013 and possibly 2014 and beyond. And I lose some part of my money that I use for spares and sustaining and maintaining airplanes in the field, which means today my operations at Eglin, where I'm training pilots and I'm training maintainers, would also have to slow down.

So without flexibility each of those pots of money will take a hit and the program will be degraded in those areas. With flexibility, the services can decide how much money from each of those pots do they really need to take, and at least we can keep the program balanced. We may not be able to keep it all at the same level, but at least in those different areas we can keep it balanced. So from my point of view it would be a great gift to have.

Senator MANCHIN. We're talking about still the \$42.5 billion that needs to be reduced from defense and non-defense between now and the end of September.

General BOGDAN. That's correct, sir.

Senator MANCHIN. But with that flexibility, you, the Department of Defense, would make the adjustments accordingly of whether are high priorities or lower hanging fruit would be priorities. You don't have that discretion today.

General BOGDAN. I do not have as much discretion as I would like, sir.

Senator MANCHIN. I got you, sir.

Admiral?

Admiral SKINNER. Senator, thanks for the question. As my CNO and the Secretary have testified before, we lost about \$6 billion out of our investment accounts, another \$4 billion out of readiness. We have some authority that came in with the Public Law 113-6 that allowed us some authorities. Those authorities were allocated by the Department of Defense. But the flexibility beyond those authorities to move money to handle our more pressing needs would be, as General Bogdan said, a great gift.

The ability to go in and selectively fix our investment programs that required fixing on a priority basis, the ability to move money out of our investment accounts and handle our more pressing readiness needs, for example our depot inductions of airframes and engines, and in this case for the Navy's ship maintenance—when we have those types of maintenance events, if we miss them they're

missed forever, until the next time around we come in with the cycle. So the ability to handle that would be a great gift.

Senator MANCHIN. General Davis?

General DAVIS. If we had the ability to put those cuts in the areas that we thought we could most handle the risk and take the force structure adjustments that we needed to, I think that would be certainly a benefit to anything we want to do in the Air Force.

When the public law was passed and the bill was passed, certain key programs that we worried very much about were made whole, notably the KC-46 tanker. That was one that was on a fixed price contract we were worried greatly about about whether we would have the ability to move the money in. But even with that one being fixed, we have no doubt that with the money we've lost out of the Air Force F-35 production lines, we will lose some number of airplanes yet to be determined. Since we have no ability to put that money back in and fix that, we know that every other airplane—kind of where Senator Wicker was going—every other airplane everybody else buys will go up by some small amount. So again, there the inefficiency starts to grow.

So we would like to be able to have some flexibility to pick the right spots. We had enough, I would say, engineering change dollars and other money that we were trying to work through simply because of the fact we had slowed down spending across all Air Force programs in the CR. So when we finally had to take the cut with the 2013 numbers, I'll tell you the results were probably not as drastic, certainly in investments. They were terrible in O and M, as I've talked about the lost flying hours.

Just say this happens to continue and the Budget Control Act continues through 2014. None of that flexibility exists. So every single program will feel it very painfully in a very, very deliberate fashion. So the flexibility would help on that.

Senator MANCHIN. Thank you all.

General Bogdan, in 2010 Secretary of Defense Gates at that time withheld \$614 million of Lockheed Martin's performance fees on the Joint Strike Fighter after performance targets were missed. Secretary Gates said: "I will withhold \$614 million in performance fees from the lead contractor since the taxpayers should not have to bear the entire burden of getting the JSF program back on track."

So I would ask, what has happened to the \$614 million fee? How much has Lockheed earned back and how much did they lose, and how much is there left for the company to earn?

General BOGDAN. Yes, sir. I'll try and go through this and try and avoid doing math in public here. But you are right, there was \$614 million of fee left post-Nunn-McCurdy breach when we rebaselined the program. Immediately as we came out of the Nunn-McCurdy breach, the Secretary of Defense took \$190 million of that money and just took it away and said: Lockheed, you will never have the opportunity to earn that money again. So right off the bat he took \$190 million.

Over the next three years from 2010 to 2012, there was award fee in the total of about \$101 million that Lockheed could have earned. They only earned \$34 million of that. So if you do the math, the \$190 million we took away, the \$101 million they could

have earned over the last three years, what's left today is \$337 million.

When we came out of the Nunn-McCurdy breach, all of the fee on this program for the development was in what we call award fee. Award fee is a subjective fee, meaning that I as the PEO kind of take a look at Lockheed's performance and get to decide how much they're going to get.

We transitioned the contract from award fee in 2012 to what we call incentive fee. So every bit of that \$337 million now is in what we call incentive fee and there is very little subjectivity. It's things that Lockheed has to do and has to perform over the next four years to earn that money.

Let me give you an example. There's \$100 million of that \$337 million that's broken up. If they deliver the 2B capability on time, they get \$40 million. If they deliver the 3I capability on time with all the capability, they'll earn \$25 million. If they deliver the 3F capability on time with all the capability, they'll earn \$35 million. That's \$100 million of the remaining \$337 million.

I've taken the last \$237 million that's left over, I put it at the end of the contract, and I've said to Lockheed Martin: You must deliver me a weapons system that meets each and every one of the system spec requirements. You must do that on time, and you must do it within the budget I have remaining on the development program. If you don't meet those criteria, you will not earn a penny of that \$237 million. And that's where we have it today, sir.

Senator MANCHIN. Thank you, sir.

At this time I want to turn it over to Senator McCain.

Senator MCCAIN. I thank the witnesses.

General Bogdan, about I guess it was a couple months ago you wrote, made some statements that were I felt rather interesting, where basically you questioned the commitment of Lockheed Martin to seeing this program through without profit being the sole motive. I don't know if that's an awkward description of your statement, but I thought it was a very strong one and I was impressed by it. Would you care to explain to the committee what you were saying there?

General BOGDAN. Yes, sir. My comments were directed at Lockheed Martin and Pratt and Whitney, and my intention was to put them on notice that I needed to make sure that they were committed in the long term to reducing costs on this program. At the time when I made that comment, I was not so sure. Doing business with both companies has been difficult. It is getting better. And I was seeing behaviors in which I thought over the next 30 or 40 years were not sustainable for a relationship between us and either one of those industry partners. So fundamentally this was a shot across the bow to them, letting them know that I was watching and I was waiting for behavior changes.

Now, having said that, there are some things that I can tell you, not necessarily directly related to my comments, but over the past nine months have seemed to taken hold on the program which I am appreciative of. First and foremost, there have been significant leadership changes in Lockheed Martin over the last few months all the way up and down the F-35 chain. The deputy program manager, the program manager, the president of Lockheed Martin

Aero, and the CEO have all changed out. I would tell you that those four individuals in those positions now have a different culture and a different attitude than when I first walked in on this program nine months ago. That is a good thing.

The other thing I have noticed, and whether it was as a result of my comments or not doesn't matter because it's good for the government anyway, Lockheed Martin and Pratt and Whitney are beginning to share in the risks of this program. For example, the last contract we negotiated in LRIP 5, Lockheed Martin has to pay for half of all our concurrency costs.

Senator MCCAIN. Could I point out that part of that was finally congressional mandate.

General BOGDAN. Yes, sir. I was going to get to that part. The concurrency part was a cost share. The part about the overruns on the price of the production was clearly a Congressional mandate for us to start forcing the contractors to take some responsibility for production cost overruns, and we appreciate that. We do.

So there have been signs that Lockheed and Pratt and Whitney do indeed want to sell us 3,164 airplanes and almost 4,000 engines. But the jury is still out. There's a long way to go. There's two-thirds of the testing to go. There's only 10 percent of the production is done. So I will be continuing to monitor this.

Senator MCCAIN. GAO gives you pretty favorable marks for your latest activities and that is encouraging. But you know, I look at the sustainment costs. GAO reports that procurement would average \$12.6 billion a year through 2037. The DOD Cost Assessment Program Evaluation Office estimates that JSF operating and sustainment costs would exceed \$18 billion a year. That's \$30 billion a year for this one program. Is that affordable?

General BOGDAN. I guess I can't answer the affordability question. I'll look to my service brethren to answer that. But more to your point, sir, you are exactly right. For our partners, for the services, for our FMS customers, if we don't start today in reducing the overall operating and sustaining costs of this airplane, it could spend—it could become very, very expensive.

Senator MCCAIN. Maybe I could ask our other two witnesses if they have a view, and maybe not. I would point out in this GAO report in 2001 it was going to be \$69 million per aircraft and now in March 2012 it's \$137 million per aircraft. That's pretty remarkable.

Admiral and General, do you have any comments?

Admiral SKINNER. Senator, it's in the best interests of the Department of the Navy and I think of the Department of Defense to drive the production cost of this aircraft down. We're encouraged by the—

Senator MCCAIN. Have you seen any signs of that?

Admiral SKINNER. Yes, sir, we have. We've seen signs that the production costs over the LRIP lots negotiated to date and projected to be negotiated in the future are coming down the learning curve and are getting more affordable.

But to your point, the numbers that you quoted earlier in your question, they're a little hard to swallow. So what we need to do is we need to do everything in our power to cooperate with the pro-

gram office and to drive the production costs down, and then conversely the sustainment costs of our jets and how we operate them.

General DAVIS. Senator, along with what Admiral Skinner said, we've shown in the Air Force that on budget issues you can make any program unaffordable as you decrease quantities. So there's a component here. The cost needs to go down—

Senator MCCAIN. I think we learned that lesson from the F-22.

General DAVIS. Sir, we learned it from the F-22 and also from the B-2, I think. As we tool up for a much larger program and we start to have issues that are somewhat related to this and we have budget issues that drive down the quantities, each one goes up.

As I mentioned, the three to five airplanes we are possibly to use out of our buy for fiscal year 2013, 3, 4, 5, \$7 million impact to every other airplane not bought, simply because quantity has changed. So there is that aspect of it.

The other aspect of it I will say is that we're all concerned about what the hourly flying cost of the airplane will be as it's computed now. But as we've learned over time on F-18s and certainly in the Air Force on F-16s and F-15s, for a lot of reasons if we end up constraining that flying hour cost to whatever our budget is none of our legacy fighters right now would be funded to 100 percent of their availability or 100 percent of their spares requirement. So we deal with that—

Senator MCCAIN. Sooner or later, that gets into the efficiency of the pilots.

General DAVIS. Yes, sir, it most certainly does. We fully fund the airplanes and the pilots that are in contact in the AOR and the folks back home will suffer for that a little bit. We would like that suffering to be minimal, but—

Senator MCCAIN. Not to mention the effect of sequestration, obviously.

Thank you. Thank you, General.

The program, General Bogdan, is two-thirds only—it still needs two-thirds of its developmental testing. Isn't that a significant risk, particularly in the area of software development? I notice in your statement that you were, quote, "moderately"—you had "moderate confidence." None of us around here seem to like the word "moderate."

General BOGDAN. Yes, sir, so let me explain. Software is the number one challenge on the program. When I use the word "moderately confident," what I am speaking about is I am moderately confident that the initial warfighting capability of the airplane that we intend to deliver to the U.S. Marine Corps in 2015 will be there with the full capability in 2015.

I am less confident that the final capability of the airplane, which is due to be delivered at the end of 2017, will happen in 2017 with the full capability. So the tough years for us are 2016, 2017, and the beginning of 2018 for the software.

What I see today for 2013, 2014, and then 2015 for the 2B capability, the initial capability, is a software process that is improving. We have lots of metrics that we can show you, and that in part is what causes me to say I'm moderately confident up to 2015. I can honestly tell you, beyond 2015 I don't have a great answer right now because there's a lot of things that have to happen between

now and 2015 to give me more confidence in 2017, not the least of which is I have to finish the flight test on this initial 2B software, as we call it.

Senator MCCAIN. My time has expired, but let me just say, we appreciate what all three of you have done. General Bogdan, I think you've gotten a hold of this program in a way that certainly the GAO is satisfied with the progress that's being made. But the three of you together represent many years of experience in the business, and the thing that bothers us the most—well, let me say the thing that bothers me the most is the whole acquisition system where we have so many years and so many cost overruns, and we don't seem to have lessons learned.

General Davis was just mentioning the B-2 and the F-22 and the cost overruns associated with that. Now, I understand the tanker is doing pretty well. Is that right, General Davis?

General DAVIS. Yes, sir, it is.

Senator MCCAIN. So what are we doing with the tanker, which I understand is a much simpler—it's a flying gas station and I understand it's much simpler than a tactical fighter weapons system. But somewhere along the line we've got to have people like you tell us the lessons learned so we don't keep repeating them, so we don't keep seeing this movie over and over again.

I would argue that there are some of us that have a long record of being staunch defenders of national defense and spending what it takes and believe we live in a dangerous world, but we've got to be able to go back to our constituents and say: They're doing a lot better than they did in the F-22 and the F-35 and the sensing devices along the Mexico border, where Boeing blew about \$787 million. These cost overruns, the American people make it hard for us to have credibility when we speak for a strong national defense.

So maybe at some time we ought to have a hearing, Mr. Chairman, on the lessons learned in these failures. I don't know if legislation is necessary. We passed an acquisition reform bill that Senator Levin and I authored and we have placed restrictions on cost overruns. But at least in the eye of our constituents, we aren't doing nearly the job that we should.

So I don't know if you have any comment on that or not, but I hope that you'll understand from our side of the dais it's a greater and greater challenge for us to continue to support these weapons systems when we are having the cost overruns that we have.

Thank you, Mr. Chairman, for allowing me this time.

Senator MANCHIN. Absolutely. While the Senator is still here, I'd like to follow up because when these programs—I'm understanding when these programs are coming to life there is a competitive process you go through, like the so-called fly-off. The companies that are competing have to build prototypes and I'm sure that's where they got their cost estimate thinking it would be a \$69 million project per unit.

I think, to follow up on what the Senator was asking, how did we let the control—how did we lose control of that cost? They had a plane, they built a plane, they basically demonstrated it. You picked one over the other, I'm sure, however that process goes. And you had pretty much a flying prototype, and they could have figured out what their cost was to get that prototype flying on that

one unit, and then they would estimate over the life if there's going to be 3,000 or more where that cost, the competitive cost, could be.

That's usually a business—that's kind of the way businesses in the real world operate. But I think what we're doing—and the Senator was being quite kind in saying, how come the military doesn't use that same process? If it was your pocket and you were paying, or your stockholders, that you were investing their money, you wouldn't operate that way. And we're not blaming any of you directly. We're saying we would have—and I think the Senator's suggestion about having a hearing strictly on the process of how we got here—I heard him. I've been here two and a half years and I look to Senator McCain as being a champion in leading not only the defense of our Nation, but also just the common sense of getting the bang for your buck. And it's hard to look the taxpayers in the eye and say we've done it.

He's a staunch defender, but it's going to be pretty hard to say let's keep pouring the money to it when they're saying it was \$69 million, now you're \$137 million. How did you double the cost and nobody had to pay the penalty for that and they're still doing business, if you will.

I'm not saying that for any other reason, but I think that we will call a hearing on that and we would like for you to be prepared to show us the turn of events so that it basically has a template, because if it happened with the B-2, if it's happened with the F-22, it's happened with the Strike Fighter, and the only thing that's come in relative to the cost has been the tanker, I mean, pretty soon—

Admiral SKINNER. We've had good luck with the F-18, sir.

Senator MANCHIN. You've had good luck with that?

Admiral SKINNER. Yes, sir.

Senator MANCHIN. Well, with that being said, how are we going to maintain this aircraft, this F-35? I mean, we look at it from the standpoint—let me just—we'll come back to that.

If the Chinese government can produce in 22 months a competitive aircraft, there had to be piracy or espionage, had to be.

Senator MCCAIN. Both.

Senator MANCHIN. Both. Are we doing anything on that line? I mean, if they're going to go ahead and copy what we've got, they ought to at least help pay a little bit for it. That's all. That's a fair request, don't you think, Senator?

Have we pinpointed it? Has their government been put to the task of—I mean, it's very obvious what they've done. I don't know if you have any comment on that or if you could comment on that.

Admiral SKINNER. We'll take that one for the record, Senator.

[The information referred to follows:]

[COMMITTEE INSERT]

Senator MANCHIN. Do you know if there's any proceedings on anybody because of these programs that you've seen being able to accelerate to the point they have? Are we investigating? Have we prosecuted anybody? Are we on the tail of anybody?

Admiral SKINNER. Sir, not to my knowledge at least. I won't speak for General Bogdan or for General Davis, but not to my knowledge. We have concentrated mainly in the Department of the Navy on protecting our data and providing information assurance

for our data within our own lifelines in the government and then subsequently with the contractors that we work with to develop and produce these weapons systems.

Senator MANCHIN. This amazing speed of 22 months, would it be part of the hacking system that we've been able to monitor and watch what is going on? Probably.

Admiral SKINNER. Yes, sir.

Senator MANCHIN. I just have just one more. Senator, thank you.

We mentioned the statement, I think, that—all of you have mentioned, we talked about the F-35 life cycle over 50 years would be approximately one trillion dollars. General Bogdan, you said we must start today to tackle long-term cycle costs of that weapon. Can you describe what concrete steps that you're taking other than what you've already just testified to? Is there anything that you might have missed or that you'd like to add to the testimony?

General BOGDAN. Yes, sir. One of the first things we've done is we've taken a look at the overall sustainment costs and broken it down into different elements. We're trying to identify areas where the JPO and the contractors can actually work to reduce costs, and I'll talk about those. But there are areas of the long-term O&S costs that fall within the services' purview to deal with. For example, how much flying time do you give each pilot relative to how much time is used in the simulator? That ratio can greatly change how costly your airplane is over the life of the airplane.

So the first thing we're doing is we're trying to separate out those things that the JPO and industry can work on and those things that the services can take a look at and work on, so that we can not work at cross-purposes.

The second thing we're doing in the JPO today is we're injecting competition into those long-term sustainment activities. I learned a very, very good lesson as the PEO for the KC-46 program that we just spoke about, what good competition can bring. It is a good. So we are—there are various areas like the supply chain, like ALIS administration, like developing and delivering support equipment, like running our training centers for our pilots and our maintainers, those are things that industry, not just Lockheed Martin and Pratt and Whitney, have great capability and capacity to do for us. There's no reason in the world why we should not open that up and find the best companies that can give the government the best value to do those things, and we're doing that today, and we should start seeing over the next few years some of those competitions come about and we should see some of the estimated costs of doing that come down.

The last thing we're doing on the program today is, we have about 6,000 hours of flying total on the fleet today. We are starting to gather real information about the reliability and the maintainability of the airplane and what parts on the airplane are failing at a greater rate than we expected, which parts are coming off the airplane and taking too long to repair. We call that a reliability maintainability program and we have a robust one going on in the Joint Strike Fighter right now to identify those cost drivers and then to do something about it. Either we redesign a part or we qualify a second source to make that part for us or we figure out

the best way to repair that part quicker and cheaper. Maybe it's organic standup of that repair capability.

Those steps over the next four or five years ought to make at least a dent in that huge \$1.1 trillion number that we hear about. So I'm committed to do everything I can for the partners—they watch this every day—the services—they watch it every day. Our FMS customers watch it every day, and they're all worried, and I think they should be and I'm working on it.

Admiral SKINNER. Senator, if I may, from a service perspective we've made great progress over the course of the last three years. We have a process in place led by the JPO that allows us to generate those numbers. We have common definitions. We have common cost allocation strategies across the services that we've all agreed to.

I know the Navy and the Marine Corps are doing exactly referred to in his first point, which is we're going through exactly how we fly our aircraft today and how we train our pilots. We look at the capabilities of the F-35B and C. We take a look at the high-fidelity simulation that is being provided by the program. We determine how many weapons that each one of our pilots need to drop a year to maintain proficiency, how many air-to-air missiles they have to shoot, how many landings they have to make per sortie.

All of that information needs to be fed into General Bogdan's model in order to come up with an accurate sustainment number. We're in the process of going through that information in great detail and providing that data to his databases over the course of the next few months.

So already we've noticed some discrepancies in our initial data that we submitted to the program and what we think we would be doing in the future. So we should see some progress in that area from a service perspective, at least the Department of the Navy service perspective.

General DAVIS. Sir, the lesson we've got to learn through this is that the F-35 is not an F-16, it's not an F-18. Unfortunately, a lot of the models we use, a lot of the decisions we make about what the cost per flying hour, is still modeled very much on how we fly F-16s and F-18s. We've learning from the F-22 that very little beneficial training is accomplished in open air because the airplane is just, it's just too smart. It sees everything, it knows everything. It's an easy flight in the cockpit. The F-35 is going to be the same way.

So you're going to have to train differently in a different fashion, notably, as has been mentioned a couple times, with some very high-fidelity sims, which would be a lot cheaper to use than the airplane and get a lot higher quality training out of that. So we—I think we, all services, are just coming to grips that this is going to be a different animal when we get it fielded and get it operational.

The same way we've put personnel on the flight line, the same way we've managed and ordered spares, the same way we've practiced weapons deliveries and weapons employment is just not going to work for this airplane, and we're going to have to come to grips with that. But we won't be able to until we get enough of our oper-

ational guys out there flying it and enough of our operational maintainers out there telling us how to do it.

Every airplane I've seen fielded in the Air Force has been fielded with an idea of how it's software was going to be used, until you turned it over to the lieutenant or a captain that had had some experience in a true situation, and basically every operational concept of our airplanes, or at least the software and the weapons systems on it was significantly revised after it was put in an operational context. So we'll see how that goes and what that does for us.

Senator MANCHIN. Well, let me thank all of you for your testimonies today and I appreciate so much your cooperation and helping us and working with us on this subcommittee. I tell you, we will be a very active subcommittee. I want to make sure you all know you have our full support. But we want to learn also and try to be constructive in the support that we have, not destructive. I know that happens an awful lot in this political toxic atmosphere we have from time to time. But we have a good subcommittee here and I think it really supports what you do. We just want to make sure that the citizens are getting the investments and getting return on investments.

I've always said there's two things we can do through tax dollars. We can spend it or invest it. And we've done a good job of spending a lot of money and we just have to start investing it a little bit wiser now. So you can help us, I think, make sure our investments are better spent.

We will keep the hearing record open for 5 days to allow members to submit additional questions. If there is no further questions, I want to thank you all again, and this hearing stands adjourned.

[Whereupon, at 4:21 p.m., the subcommittee adjourned.]