AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

[H.A.S.C. No. 116–45]

STATUS OF THE B61–12 LIFE EXTENSION AND W88 ALTERATION 370 PROGRAMS

HEARING

BEFORE THE

SUBCOMMITTEE ON STRATEGIC FORCES

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

FIRST SESSION

HEARING HELD
SEPTEMBER 25, 2019

U.S. GOVERNMENT PUBLISHING OFFICE
40–275 WASHINGTON : 2020

SUBCOMMITTEE ON STRATEGIC FORCES

JIM COOPER, Tennessee, *Chairman*

SUSAN A. DAVIS, California
RICK LARSEN, Washington
JOHN GARAMENDI, California
JACKIE SPEIER, California
SETH MOULTON, Massachusetts
SALUD O. CARBAJAL, California
RO KHANNA, California
WILLIAM R. KEATING, Massachusetts
KENDRA S. HORN, Oklahoma, *Vice Chair*

MICHAEL R. TURNER, Ohio
JOE WILSON, South Carolina
ROB BISHOP, Utah
MIKE ROGERS, Alabama
MO BROOKS, Alabama
BRADLEY BYRNE, Alabama
SCOTT DESJARLAIS, Tennessee
LIZ CHENEY, Wyoming

GRANT SCHNEIDER, *Professional Staff Member*
SARAH MINEIRO, *Professional Staff Member*
ZACH TAYLOR, *Clerk*

CONTENTS

STATUS OF THE B61–12 LIFE EXTENSION AND W88 ALTERATION 370 PROGRAMS

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Wednesday, September 25, 2019.

The subcommittee met, pursuant to call, at 2:00 p.m., in room 2118, Rayburn House Office Building, Hon. Jim Cooper (chairman of the subcommittee) presiding.

Mr. COOPER. The subcommittee will come to order.

I would like to welcome the witnesses, Dr. Verdon, General Clark, Admiral Wolfe.

This is an important topic. I will dispense with my opening statement and ask unanimous consent that it be inserted for the record so that we can get to the witness testimony. We also planned a classified session after this, but we wanted to have as much of it in the public as we could.

With that, I will yield to the distinguished ranking member.

[The prepared statement of Mr. Cooper can be found in the Appendix on page 17.]

STATEMENT OF HON. MICHAEL R. TURNER, A REPRESENTATIVE FROM OHIO, RANKING MEMBER, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. TURNER. Thank you, Mr. Chairman.

I would like to thank all the witnesses for being here today. You were here back in March and April; appreciate you stopping in to give us this update.

The B61 and the W88 are both critically important programs in our Nation's nuclear modernization efforts. The B61–12 Mod 12 Life Extension Program consolidates and replaces older B61 that were first produced in 1968. Mod 12 will have advanced accuracy and produce less fallout compared to previous versions of the weapon. It is a necessary and prudent life extension and a programmatic delay. I continue to strongly support this program. As former president of the NATO [North Atlantic Treaty Organization] Parliamentary Assembly, I know the credible contributions the B61 currently makes to nuclear deterrence in Europe, and I will continue to support it.

As I read in your submitted statement, the W88 Alt [Alteration] 370 is needed to replace the arming, fusing, and firing subsystems of the warhead, as well as refreshing the conventional high explosives in the warhead.

While experiencing similar programmatic delays again, I strongly support this program and recognize the unique contributions our submarines provide our nuclear—as a nuclear deterrent.

I look forward to hearing your testimony on the source of the problem and how to move forward in a responsible manner.

And then I want to express my disappointment that we are even having this hearing. We have a longstanding tradition in our committee that we don't have hearings on—public hearings, especially, on issues that are being considered in conference. These issues are currently being negotiated in conference right now that affect these programs. We usually have intake hearings as we are preparing for the NDAA [National Defense Authorization Act], not as we are negotiating of the NDAA.

But, nonetheless, the majority has decided to do this in a very public fashion. Again, our nuclear weapons and the issues affecting them—as the chairman said, we are going to be going into a classified session—could easily have been dealt with solely in the classified session. So the only reason why we must be in public is for there to have some difficult discussions about support for the nuclear deterrent that we have that is part of our Nation's security.

I think this is a disappointment. It is continued politicization of the process of this committee that we have seen throughout this year, and I am eager to hear what the chairman considers as his questions that are so needed for him to bring forward in the public that we couldn't have just had in our discussion in our meeting that we are going to have afterwards.

I yield back.

Mr. COOPER. I appreciate the gentleman's eagerness.

Let's start with the witness testimony.

Dr. Verdon.

STATEMENT OF HON. CHARLES P. VERDON, DEPUTY ADMINISTRATOR FOR DEFENSE PROGRAMS, NATIONAL NUCLEAR SECURITY ADMINISTRATION

Dr. VERDON. Chairman Cooper, Ranking Member Turner, members of the subcommittee, thank you for the opportunity to testify on the status of the Department of Energy's National Nuclear Security Administration's B61–12 Life Extension and W88 Alteration 370 programs.

The U.S. nuclear deterrent continues to be the cornerstone of America's national security and global stability. It is imperative that we modernize all aspects of our nuclear deterrent, including delivery platforms, the warheads, the infrastructure required to deliver those warheads. And further, we need to hire and train and retain the workforce necessary to carry out these challenging tasks involved.

These modernization activities ensure that the U.S. nuclear weapon stockpile continues to meet Department of Defense requirements while enhancing warhead safety and security. With the successful completion of the W76–1 Life Extension Program in December of 2018, NNSA [National Nuclear Security Administration] is currently executing five warhead modernization activities. Some aspects are common across these very complex activities; however,

there are also many unique aspects due to their different delivery requirements.

As with any complicated endeavor, unplanned technical challenges arise, as has been encountered on the B61–12 LEP [Life Extension Program] and the W88 Alt 370 associated with a limited number of electrical components.

So first, let me—there are two main aspects of each warhead modernization activity. The first is we must identify a technically feasible design that meets the requirements set forth. The second is we must establish confidence that the design chosen will continue to meet those requirements and work reliably 20 to 30 years after production.

Technical issues with some capacitors used in the B61–12 and W88 Alt 370 were identified while gathering data to certify the reliability of these weapons for the required 20- to 30-year stockpile life. Early tests on the capacitors now in question and subsequent tests, including component, major assembly, and full-up integrated system flight tests, demonstrated that these components meet requirements today.

Industry best practices were used to stress the components beyond their design planned usage as a way of establishing confidence that they will continue to work over the necessary lifetime of the warhead. During stress testing, a few of these commercially available capacitors did not meet the reliability requirements.

NNSA, in coordination with DOD [Department of Defense] and supported by a blue ribbon panel established by NNSA, whose memberships included representatives from the Air Force Nuclear Weapon Center, the Defense Microelectronics Activity, Naval Surface Warfare Center-Crane Division, Honeywell, Northrop Grumman, and Pennsylvania State University, advised in June 2019 that the prudent approach was to accept the delay to these programs and replace these components, rather than risk component failure in the future years. These recommendations were accepted by NNSA at that time.

Delays to the first production unit for both programs are approximately 18 to 20 months. NNSA is working with DOD to develop specific production schedules for the two programs in question. Initial operational capability dates and last production dates are being explored with the United States Air Force to meet their deployment needs and with the United States Navy to minimize impact of fleet operations.

All other components unaffected by the capacitor issues are continuing with readiness and production activities on their original timelines to mitigate delays and impacts on other ongoing warhead modernization activities.

Upon identification of these issues, NNSA initiated two internal reviews to identify cause and lessons to be learned. Both teams gathered information from interviews, site visits, and discussions with other organizations that undertake similar electronic component work.

As a root cause, we identified that our methodology for the insertion of commercial off-the-shelf, or COTS, components into high reliability, long-life nuclear warheads needs to be improved. We are examining our process to identify improvements and actively work-

ing to mitigate such future risks. We are using the W80–4 LEP and the W87–1 modification program to incorporate these lessons learned to minimize the chance of future COTS-related risks.

Progress is reviewed on a regular basis. And then be assured that my team and I are actively engaged in every aspect of the recovery process. Additionally, it is my responsibility to ensure that NNSA learn from what occurred in order to reduce the likelihood of reoccurrence during other ongoing warhead modernization activities.

The efforts of our dedicated professionals across the nuclear security enterprise continue to drive progress towards our modernization milestones, and NNSA is an organization striving for continuous improvement.

I look forward to continuing to work with Congress to sustain the nuclear deterrent for both near term and long term, a test that will require continued strong support of this committee for adequate and stable investments to support the scientific tools, capabilities, and infrastructure needed to maintain and modernize the stockpile.

Again, I appreciate the opportunity to appear before the subcommittee, and I look forward to answering your questions.

[The prepared statement of Dr. Verdon can be found in the Appendix on page 18.]

Mr. COOPER. The gentleman, General Clark.

STATEMENT OF LT GEN RICHARD M. CLARK, USAF, DEPUTY CHIEF OF STAFF FOR STRATEGIC DETERRENCE AND NUCLEAR INTEGRATION, U.S. AIR FORCE

General CLARK. Good afternoon, Chairman Cooper, Ranking Member Turner, distinguished members of the subcommittee. Thank you for the opportunity to discuss modernization efforts for the B61–12 gravity bomb. It is an honor to present the Air Force before you today.

The return of great power competition means the United States faces a more diverse and advanced nuclear threat environment than ever before. The 2018 Nuclear Posture Review highlighted that Russia has adopted military strategies and capabilities that rely on nuclear escalation for their success, which is a troubling doctrinal trend.

Despite U.S. efforts to reduce the role of nuclear weapons in international affairs and negotiate reductions in the number of nuclear weapons, neither Russia nor China have reduced the role of nuclear weapons in their national security strategies or the number of nuclear weapons they field. Rather, they have moved decidedly in the opposite direction. Therefore, the United States must maintain a credible nuclear deterrent to ensure our ability to deter aggression, assure our allies and partners, hedge against uncertainties, and achieve U.S. objectives should deterrence fail.

Modernization and recapitalization are paramount to maintaining a credible deterrent in the evolving strategic security environment. The 2018 Nuclear Posture Review calls for the Department of Defense and the Department of Energy to prioritize and fund their respective nuclear delivery systems and warhead programs for synchronized delivery. The B61–12 Life Extension Program and Tail Kit Assembly is one such effort, and ensures the B61 meets

USSTRATCOM [United States Strategic Command] and NATO requirements well into the 21st century.

NNSA has a crucial role to play as all three legs of the nuclear triad, as well as our forward-deployed nuclear forces, require the warheads it develops and sustains, and they are working diligently to deliver assured, reliable capabilities on time to the warfighter. As a result of their diligence, NNSA has identified an issue with capacitor components that did not meet reliability requirements, and consequently, the B61–12 Life Extension Program and concurrent W88 Alteration 370 program will not meet initial production date requirements. I am confident, however, that the capacitor issue will be satisfactorily resolved.

The Air Force will continue synchronizing efforts with the Navy, NNSA, OSD [Office of the Secretary of Defense], and USSTRATCOM, working in lockstep with them through the Nuclear Weapons Council to understand and mitigate associated costs, near-term impacts to deployment, and any follow-on implications due to the delay, ensuring our nuclear modernization efforts support the nuclear triad, forward-deployed nuclear forces, and joint force requirements.

The Air Force values the continued support of Congress and the Nation, and we are committed to providing the tools necessary to deter the most existential threat to America's survival. The flexible capabilities and complementary nature of the nuclear triad, forward-deployed nuclear forces, and associated weapons ensure the credibility of the U.S. deterrent, while complicating an adversary's decision calculus. Our nuclear weapons and nuclear deterrence are the backstop of U.S. national security and underwrite every diplomatic and military operation on the globe.

We are committed to ensuring the successful modernization and recapitalization of these critical programs.

Thank you again for allowing me to appear today, and I look forward to answering your questions.

[The prepared statement of General Clark can be found in the Appendix on page 24.]

Mr. COOPER. Thank you very much, General.

Admiral.

STATEMENT OF VADM JOHNNY R. WOLFE, JR., USN, DIRECTOR, STRATEGIC SYSTEMS PROGRAMS, U.S. NAVY

Admiral WOLFE. Chairman Cooper, Ranking Member Turner, and distinguished members of the subcommittee, thank you for this opportunity to discuss a vital refurbishment effort of our sea-based leg of the triad. It is an honor to testify before you representing the Navy's Strategic Systems Programs, or SSP.

Nuclear deterrence is the Department of Defense's number one priority mission. The Nation's nuclear triad of intercontinental ballistic missiles, strategic bombers, and ballistic missile submarines equipped with submarine-launched ballistic missiles is the bedrock of our ability to deter aggression, assure our allies and partners, achieve U.S. objectives should deterrence fail, and hedge against an uncertain future.

Today's *Ohio*-class submarine and Trident II (D5) Strategic Weapon System together compose the sea-based leg of the deter-

rent. The Trident II (D5) missile is capable of carrying two different types of warheads, the W76 and the W88, both deployed in the late 1970s and 1980s, respectively. Over the last 20 years, the Navy and our partners at the Department of Energy's National Nuclear Security Administration, or NNSA, have executed efforts to refurbish these warheads to address aging and obsolescence.

The W88 Alteration 370 refurbishing effort begun in 2008 focused on procuring additional arming, fusing, and firing units, and replacing the system's high explosives, in conjunction with the routine replacement of discrete system components. Historical challenges had delayed the initial program production until December 2019, removing any schedule margin for the refurbishment effort.

Recently during testing, NNSA identified an issue with capacitor components that did not meet reliability requirements and will not be available to this program in order to meet required production dates. The Navy and NNSA are planning for an approximately 18-month delay to the W88 Alt 370 program and are working to understand associated costs and the follow-on implications to our entire Trident II (D5) program of record.

Concurrently, the Navy is working with USSTRATCOM to understand the near-term impacts to deployments and to ensure that the Navy can continue to meet USSTRATCOM requirements. I am confident that the Navy, NNSA, and the Nuclear Weapons Council will address this refurbishment challenge with mission-focused attitude and rigor.

Delays to warhead refurbishment programs are unfortunate, but they are a potential reality for which the Navy prepares. Issues associated with the W88 Alt 370 program highlight the critical importance of a robust, nuclear enterprise-wide suite of skilled workforce professionals, rigorous processes, and a healthy manufacturing and industrial base.

Now, more than ever, the Navy needs the continued support of Congress and the Nation as the Navy, NNSA, the Air Force, and the Nuke Weapons Council work together to manage this delay and to plan future warhead work across the enterprise.

Thank you, and I look forward to your questions.

[The prepared statement of Admiral Wolfe can be found in the Appendix on page 29.]

Mr. COOPER. Thank you, Admiral.

And thanks to all the witnesses for your excellent testimony.

The purpose of this hearing today is just to watch over taxpayer dollars because we have an obligation as stewards of taxpayer money to make sure that it is properly spent. And any time there is a delay or cost overrun, I think it is worthy of note. These are vitally important programs for America, but there are no sacred cows, so we need to make sure that 18-month, 2-year delays, cost overruns, can be better understood so they can be avoided in the future.

It is completely unrelated to this hearing today, but just this morning we were told there is a Federal court decision in Tennessee which is delaying the UPF [Uranium Processing Facility] facility, which is one of the most expensive buildings ever built, $6.5 billion, because the environmental paperwork wasn't done properly. That is amazing.

Can any of the witnesses tell me about the approximate cost of these capacitors that are delaying the life extension programs of these vitally important warheads?

Dr. VERDON. Yes, sir. The original capacitors, the ones in question, were basically around $5 per part. Their replacement capacitors, which are built to now a new standard that wasn't—that did not exist at the time the original capacitors were procured, are more like $75 per part, because they are built to a much more rigorous standard.

Mr. COOPER. So that is the cost of replacing the technical component that could have failed in a stress test?

Dr. VERDON. Right.

Mr. COOPER. Now, the overall cost of these delays is approximately what?

Dr. VERDON. So for the B61, early estimates right now, we are still working it, but our estimates right now for the B61–12 will be $600 to $700 million, and for the W88 Alt 370, the NNSA costs will be around $120 to $150 million.

Mr. COOPER. So in rough figures, due to the defect of a component that costs less than $100, taxpayers will face extra charges on the order of close to a billion dollars?

Dr. VERDON. But it is our plan to address that by basically balancing the workload within our modernization portfolio. As part of our lessons learned from this activity, we have already undertaken design simplifications on the 80–4 and the W87–1 that will allow us to, in the out-years, to move money that was originally allocated for those activities to the B61–12 and the W88 Alt 370. And then using the contingency and management reserve that are currently in those programs, that is going to be our approach, is not to request any increase to the bottom line for the modernization effort, but to balance within the modernization portfolio.

Mr. COOPER. So in exchange for spending the extra billion dollars right now, we may be able to find another billion somewhere so there would be no net extra cost to the taxpayer?

Dr. VERDON. That is our objective and our goal, and we are working hard towards that.

Mr. COOPER. And we would know the answer to that question in what year?

Dr. VERDON. Hopefully, very shortly in terms of our ability to meet that. I would say it is probably within a year that we would have a good idea whether we will be able to do that. There is no increase needed in 2020, so it is really—the first time we would need increased funding would be in fiscal year 2021.

Mr. COOPER. I very much hope your prediction comes true. That would be wonderful.

Dr. VERDON. That is certainly our focused goal to achieve that.

Mr. COOPER. And you would be willing to come back within a year's time and help us understand that?

Dr. VERDON. Certainly. Yes, sir.

Mr. COOPER. We like accountability. That is a good thing. I have no more questions right now.

The ranking member?

Mr. TURNER. I yield my time to Joe Wilson.

Mr. WILSON. Thank you, Ranking Member Mike Turner.

Dr. Verdon, I appreciate your service with the National Nuclear Security Administration, NNSA. Your statement, "the United States nuclear capabilities continue to be the cornerstone of America's national security and global stability, and serve as the ultimate deterrent against a nuclear attack," is important as we look at deterrence within the nuclear power competition context.

The overall age of our nuclear deterrent capabilities is a weakness in the strategic triad. The U.S. nuclear weapons are surpassing their intended service lives, as has been discussed. The Nuclear Posture Review addressed the importance of modernizing our plutonium pits, including 80 pits at 2 sites per year by 2030.

Do you agree that in order to modernize our nuclear capabilities, NNSA should comply with the Nuclear Posture Review and increase capacity across two sites to modernize plutonium pits? What delays in plutonium pit production impact service life extension programs?

Dr. VERDON. So I do agree that the 2-site solution of 80 pits per year by 2030 is a prudent approach to managing the stockpile going forward. And delays in that, yes, in my mind will add risks to the long-term viability of the stockpile.

Mr. WILSON. Additionally, the program delays for B61 and W88 have been costly and led to significant lessons learned. I have supported the requirement of 80 plutonium pits per year at 2 sites, which has a strict timeline that I have been assured can be attainable.

How will the NNSA consider the reports from the cost estimating and programs evaluation for future service life extension programs and ensure these problems do not continue with future service life extension programs and plutonium pit production?

Dr. VERDON. As I mentioned, we are a learning organization and we have—as soon as this occurred, we instituted a lessons team to go find the causes of this, and then we are applying those lessons now to the other systems to minimize the chance of this reoccurrence. And so we have revamped and changed how we approached the work on these systems already, on the newer systems, to learn from what occurred. And that is what a good, you know, learning organization does, is they will make changes. They utilize what has worked and they change what had issues, and that is what we are doing right now.

Mr. WILSON. That is very encouraging. And I look forward to continue working with you, in particular, the two-site solution, the Savannah River Site and Los Alamos. I think it is just so important to have two sites to reach the goals that should be attained.

And General Clark, the B61 is consolidating four of five variants of the B61. How do our NATO partners view the necessity of this life extension and consolidation? What are the impacts to the operational Air Force units of not successfully executing this life extension?

General CLARK. Sir, thank you for the question. Our NATO partners view the B61–12 very favorably, especially as we take the aspects of safe, secure, and reliable components and consolidate that in the B61–12 and enhance those features. So that gives us a better weapon set. It allows us the operational requirements also that our combatant commanders as well as our NATO partners require

from that weapon. As was discussed earlier, it is a more capable system.

But, really, it boils down to the safety, security, and reliability. And by consolidating that into a single weapon, it is much more manageable, it is much improved, and it simplifies, I think, our maintenance and the sustainability of that program out into the future.

Mr. WILSON. Thank you for your very clear explanation of these very complicated issues.

And now we throw it, of course, to Admiral Wolfe. What is the operational impact of the W88 delay to the fleet's ability to meet STRATCOM at-sea requirements?

Admiral WOLFE. Thank you for the question, sir. So as we work with USSTRATCOM, we are looking at mitigation strategies. Obviously, this delay is going to cause us to have to look at how we re-plan, both how we turn around the stockpile. And what I mean by turn around the stockpile is how we now re-plan to get these weapons back to Pantex when they are ready and NNSA is ready, and then get them back out to the fleet.

I would be happy in the closed session to go into a little bit more detail about what that means. We will have STRATCOM as well and we will be able to walk you through the implications of that. But currently today, based on what we are doing with STRATCOM, we will meet the requirements as we move forward.

Mr. WILSON. Thank you.

And one final for Dr. Verdon. You stated that more than half of the National Nuclear Security Agency's facilities across the nuclear security enterprise date back to the Manhattan Project. Please speak to the impacts of the NNSA's aging infrastructure and how it serves as an obstacle to the life extension programs to the B61–12 and W88 Alterations.

Dr. VERDON. So the risk occurs with any of the potential failure in those older buildings. While those sites that have the buildings on them work, do heroic efforts to keep them functioning, we do know and have tracked increased maintenance costs on them. And if we were to lose some of those facilities, it will immediately impact both the sustainment of the present stockpile as well as delivery of future—of the modernization warheads that the DOD is requiring.

Mr. WILSON. I thank each of you for being here today.

I am happy to yield back to Chairman Cooper.

Mr. COOPER. I thank the gentleman from South Carolina.

The gentlelady from Oklahoma is recognized.

Ms. HORN. Thank you, Mr. Chairman. And thank you to all of you for your testimony today.

Dr. Verdon, I would like to follow up on a few questions helping us to understand this in your testimony, discussing the critical cornerstone that is our Nation's nuclear arsenal and our national security. So wanting to follow up, understanding that there will be delays due to technical failures, as is the nature of these challenges, can you speak to what lessons that you have learned during these delayed programs that we can take into the future to address that issue?

Dr. VERDON. Certainly, glad to address that. Yes. One of the key lessons we learned, we always had a mixture when we were working on our warheads, even back during the Cold War, where 30 percent of our components—these components were made from components off-the-shelf, COTS technology. Now it is moved—so it used to be 30 percent outside, 70 percent inside. Now we have moved more to 70 percent outside and 30 percent inside.

And what we did not recognize, and one of the lessons we learned, is the variability that can exist even within a given vendor just between different lots. Different lots. So when you buy the components, if you get different lots of them, there can be variability in how they are produced. That is something that we underestimated, but we are learning that. You know, we have learned that now already, and have changed how we are going to procure the parts and how we are going to test the parts. We are going to be more rigorously testing the parts earlier on in the process so that if there is an issue, we can uncover it sooner. So that is one of the key lessons learned.

And then we even identified some organizational improvements so that we have to be able to flow up information more quickly to respond to. So there is—it has been across the board that we have identified the major cause, I would say, is our underestimation of the variability between lots.

But then we had a lot of what I will say contributing causes—or not a lot—a number of contributing causes that we are also addressing that will improve the flow of information so that we can respond even quicker when we do uncover these types of technical issues, which are, as you mentioned, are inevitable in these types of programs.

Ms. HORN. Thank you.

And following up, I want to ask, and then this can be for all three of you, your sense of addressing these critical issues that impact our national security and knowing that we are moving forward. What role can Congress play to help mitigate the delays of these weapon systems and identifying these potential pitfalls sooner? What do you need from us?

Admiral WOLFE. Yes, ma'am. Thank you for the question. So I would submit, just as a general program manager, as we continue to develop and look at how we build these systems, pushing everything as far to the right as we do until we take all of our margin away, and being able to get some of that learning and actually make a turn in time so that we don't find ourself in situations like this. That is incredibly important.

And as I said in my opening statement, if you look at the age of these systems and the technology that we are using, these are tough, tough issues to solve. And it is critical technology that we are learning as we modernize these. So anything that Congress can do to help us keep the funding on schedule and on the timelines that we have requested helps us get that testing done earlier and identify these so we don't find ourself having to do some of these last-minute turns, which kind of put us in these situations.

General CLARK. Ma'am, I think I would certainly second Admiral Wolfe's sentiments on that. Last minute, if you will, recapitalization of modernization does put us in a box. The other thing that

I would add, though, is that the support for NNSA, for our labs, for our production facilities, and to ensure that they have the manpower and the expertise, not only for now, but into the future, to ensure that the production, the design, modernization of these weapons is consistent, and that we can carry it out into the future.

Given the strategic environment that we are in, it is a capacity and a capability that we have to have. And I know I can speak for Admiral Wolfe and the Navy, but we in the Air Force as well rely—I can't even stress how important our reliance is on NNSA and the Department of Energy. So support for our brothers and sisters in the Department of Energy is critical.

Ms. HORN. Thank you.

Thank you, Mr. Chairman. I yield back.

Mr. COOPER. I thank the gentlelady.

The gentleman from Tennessee is recognized.

No questions? Okay.

Are there any other questions for this panel then?

Oh, Mr. Lamborn, our auxiliary member. I ask unanimous consent that he be able to ask questions.

Mr. LAMBORN. And thank you, Mr. Chairman, and committee.

Just a couple of quick questions. Thank you all for being here. Thank you, Mr. Chairman, for having this hearing.

At this point, given the delays in the 61 and 88, does it make sense to make all of the non-nuclear components in-house? You said 70 percent, but what about 100 percent?

Dr. VERDON. So that is also a lesson we are taking to look at examining that more closely. What we have come to the conclusion of, though, is we are going to be evaluating it on a part-by-part basis, if you like. What we are finding is that, also one of the lessons learned, is we are improving our interactions with the vendors themselves. We are trying to make sure that the vendors understand our requirements very early in the process as we even begin to engage them so they can tell us whether they think they can meet our requirements or not.

In some cases, the vendors want to work with us and will actually improve their processes to actually meet our requirements. So we are going to look at it on a part-by-part basis. And for those parts that the vendors would have a hard time meeting, we would look at those to bring back in-house. For those that the vendors can meet and then we test that they can meet, we will gladly stay with the process that we are using right now.

So we are going to try to take a measured approach to that. You know, it is an excellent question; it is one that we have been asking ourselves quite a bit.

Mr. LAMBORN. Okay. Thank you. And apparently, a lot of the non-nuclear component production is done in Kansas City. What are the bottlenecks there, and what are you doing to fix it? I know you partially answered that already.

Dr. VERDON. Yes, sir. In Kansas City, what we are finding, actually, is floor space and manpower has been bottlenecks. We are actively working right now to get them some additional floor space. They are hiring. They are doing a great job hiring their workforce. The site is doing an excellent job at that. We are working to get them additional floor space and the equipment that they need to

enable to do the workload, the increased workload, that they are seeing. So we are working together to give them the extra capacity that they need.

Mr. LAMBORN. Thank you. And you mentioned—my last question. You mentioned the workforce. How important is it that we in Congress stay up to date with funding for you so that the industrial base stays intact and the workforce stays as much up to date as possible?

Dr. VERDON. As was mentioned, I think the funding, the stability of the funding, the adequacy of the funding is critical because that is what can actually send—you know, the complex comes to a halt if the funding is, you know, not adequate or it is not predictable. We have to sometimes slow down. That is what does cause us issues. So that if it is stable and predictable, then the sites can plan for the future, which they have to when it comes to workforce, and so it is actually very critical that we have that.

Mr. LAMBORN. Okay. Thank you.

Mr. Chairman, I yield back.

Mr. COOPER. I thank the gentleman from Colorado.

Any other questions from the subcommittee before we go into closed session?

Looks like there are none.

So why don't we recess and go into closed session in the SCIF [Sensitive Compartmented Information Facility].

Thank you.

[Whereupon, at 2:35 p.m., the subcommittee proceeded in closed session.]

A P P E N D I X

SEPTEMBER 25, 2019

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

SEPTEMBER 25, 2019

Strategic Forces Subcommittee Chairman Jim Cooper
Opening Statement
Hearing on the Status of the B61-12 Life Extension and W88 Alteration-370 Programs

September 25, 2019

Good afternoon. The purpose of today's hearing is to understand the causes and impacts of significant delays to two ongoing warhead updates, the B61-12 and the W88 Alt-370. Let me thank our witnesses, Dr. Charles Verdon, Vice Admiral Johnny Wolfe, and Lieutenant General Richard Clark.

Our nuclear deterrent is the ultimate safeguard of our nation, and we must ensure the nuclear arsenal remains safe, secure, and effective. This is, as it should be, the Nation's #1 priority. As the witness testimony notes, the United States is undertaking the most significant update of our nuclear complex in decades. This recapitalization is both necessary and hugely expensive. Maintaining Congress and the public's confidence in these programs, and their effective execution, is imperative.

While many of the specifics of these warhead programs are classified, we owe the public a general understanding. NNSA's own Cost Estimation and Program Evaluation office publicly predicted these delays years ago, and has raised concerns about future warhead programs as well. NNSA's independent cost estimated also believe that such a delay would cost approximately $1 billion for the B61-12 alone. Yet, the Committee has still not received formal notification of these delays from the Department of Energy.

At this hearing, as well as at the classified session to follow, I look forward to better understanding how NNSA, working with the Air Force and the Navy, plans to learn from these delays and make the necessary changes to prevent future ones. We must ensure they do not cause additional delays and cost overruns for future warhead life extension provisions. Thank you.

Statement of Dr. Charles P. Verdon
Deputy Administrator for Defense Programs
National Nuclear Security Administration
U.S. Department of Energy
On
Status of the B61-12 Life Extension and W88 Alteration 370 Programs
Before the
Subcommittee on Strategic Forces
House Committee on Armed Services

September 25, 2019

Chairman Cooper, Ranking Member Turner, Members of the Subcommittee, thank you for the opportunity to testify on the status of the Department of Energy's National Nuclear Security Administration's (NNSA) B61-12 Life Extension Program (LEP) and W88 Alteration (Alt) 370 Program. NNSA appreciates the Committee's continued support of the U.S. nuclear security enterprise.

The 2018 Nuclear Posture Review (NPR) acknowledged that the global security environment is growing increasingly dangerous and uncertain. Countries such as Russia, China, and the Democratic People's Republic of Korea are modernizing, expanding, and diversifying their nuclear arsenals. NNSA's modernization activities are central to the President's goal to ensure that U.S. nuclear capabilities are modern, robust, flexible, resilient, ready, and appropriately tailored to deter 21st-century threats and reassure America's allies.

The United States' nuclear capabilities continue to be the cornerstone of America's national security and global stability, and serve as the ultimate deterrent against a nuclear attack. U.S. nuclear capabilities provide a nuclear "umbrella" of protection for many allied nations, reducing their need to develop and field their own nuclear weapons, thereby helping to dissuade nuclear proliferation. Further, the U.S. nuclear weapons program provides the scientific, technological, and engineering foundation for U.S. nuclear nonproliferation, counterproliferation, and counterterrorism programs. For these reasons, it is the policy of the United States to retain and maintain its nuclear deterrent until nuclear weapons can be prudently eliminated.

NNSA's Unique Position

NNSA is uniquely situated to provide the research, development, production, and dismantlement capabilities necessary to support the U.S. nuclear weapons stockpile. This includes managing an industrial base within its nuclear security enterprise (NSE). The NNSA NSE spans eight government owned, contractor operated sites throughout the country. Over the past five years, NNSA has begun to make significant investments rebuilding the NSE to provide the modernized weapons required by the Department of Defense (DoD). Learning from our history, but looking forward, we are making progress in repairing, replacing, and modernizing our industrial base, stabilizing deferred maintenance, and addressing high-risk excess facilities; nonetheless, much more remains to be done over the next decade and beyond. In fact, more than half of NNSA's

facilities across the NSE are over 40 years old, and roughly 30 percent date back to the Manhattan Project.

NNSA needs to build an effective, responsive, and resilient nuclear weapons infrastructure to adapt to shifting requirements. This will require sustained investments to make the necessary improvements to the NSE. NNSA needs the continued support of Congress to provide the resources to enable the United States to have a safe, secure, and reliable nuclear weapons stockpile.

Weapons Modernization Activities – Life Extension Programs, Alterations, and Modifications

Modernizing the U.S. nuclear stockpile requires investment in three main components: (1) production capabilities, (2) technical and scientific expertise and tools, and (3) infrastructure. At this time, every leg of the Nation's nuclear triad is undergoing modernization. NNSA needs to provide modernized weapons, synchronized with DoD platform modernization, which requires responsive and resilient production and scientific infrastructure to support these modernization activities.

NNSA is committed to the execution of policy direction provided by the 2018 NPR, as instituted by directives from the Nuclear Weapons Council (NWC). Warhead modernization activities, which include LEPs, Alts, and modifications (Mods), provide weapons that meet DoD performance and both DoD and NNSA safety and security requirements, and require no additional explosive nuclear testing to certify the warhead for entry into the stockpile. These activities address aging, lack of replacement parts, and new flight characteristics due to changes in DoD delivery platforms. NNSA extends the service life of weapons that have reached the end of their original design life through LEPs. Other modernization efforts include Alts, which do not change the weapon's operational capabilities, and Mods, which do change the weapon's operational capabilities. NNSA also conducts surveillance and assessment activities to ensure that weapons currently in the stockpile remain safe, secure, and effective. Laboratories, plants, and sites across the NSE work together on this enduring national security mission.

To execute these modernization programs for the Nation's stockpile, NNSA, in partnership with DoD through the NWC, conducts activities in a joint nuclear weapons lifecycle process for sustainment of the stockpile through refurbishment activities. Referred to as the 6.X process, this addresses DoD and NNSA weapons modernization needs from concept assessment to full scale production, and finally to retirement. With five warhead modernization activities underway, NNSA is executing an unprecedented variety of complex component development and production work through this process, and continues to make progress across all five programs.

Technical Issues with the B61-12 LEP and W88 Alt 370

NNSA informed Congress in the spring of 2019 that we experienced technical issues associated with a limited number of electrical components that will delay both the B61-12 LEP and the W88 Alt 370. There are two key aspects of each warhead modernization activity. First, we must

identify a technically feasible design that meets requirements and then we must establish confidence that the design will continue to meet requirements 20-30 years after production. While the problematic components have worked during all system tests (component, major assemblies, and full-up integrated system flight tests) for both the B61-12 LEP and the W88 Alt 370, technical issues were identified that led us to question the components' long-term viability.

Best practices from the electronic component industry were used to stress the components beyond their intended use range (e.g., utilized at higher than the intended voltages, exposed to temperature and mechanical insult) as a way of establishing confidence they will continue to work over their 20-30 year lifetime after production. Stress testing concluded that commercially available capacitors did not meet reliability requirements, though early tests conducted approximately three years prior showed these components met the requirements. NNSA determined that the prudent approach is to replace those components rather than risk component failure in future years. NNSA is coordinating closely with DoD to mitigate delays to these weapons programs. Delays to the First Production Unit (FPU) for both programs are estimated to be around 20 months. NNSA is working with DoD to develop specific production schedules, initial operational capability dates, and last production unit projections. All other major components, unaffected by the capacitor failures, are continuing with production and readiness activities.

Upon identification of these issues, NNSA launched two internal groups within the Office of Defense Programs composed of active and retired Federal and Management and Operating (M&O) contractor personnel to identify causes and potential lessons to be learned. Both teams gathered information from interviews, site visits, and discussions with other organizations that undertake similar electronic component work. There are a number of lessons associated with the occurrence of this technical issue that have been identified and are being addressed to minimize the re-occurrence of this issue in future warhead modernization activities. We have identified that the technical issues experienced within the B61-12 LEP and W88 Alt 370 programs ultimately stemmed from the processes used for inserting commercial off-the-shelf (COTS) components that left the programs vulnerable to technical risk and schedule delays. When triggered, these potential risks create disproportionate impacts on the program. A strategic reevaluation of the process is underway while tactical process improvements have been implemented. We are actively using the W80-4 LEP and the W87-1 Mod to take these lessons and identify solutions to minimize the chance of them reoccurring. The incorporation of the lessons learned into the W80-4 and W87-1 are reviewed on a regular basis.

W88 Alt 370

The W88 Alt 370, currently in Phase 6.4, *Production Engineering*, supports the sea-based leg of the nuclear triad. This program includes a new arming, fuzing, & firing assembly, a conventional high explosives (CHE) refresh, a new lightning arrestor connector to enhance nuclear safety, trainers, flight test assemblies, and associated handling gear to maintain the W88 warhead in the existing nuclear weapons stockpile. Earlier this month, the NWC approved a revised FPU date of the 4th quarter of Fiscal Year (FY) 2021 for the W88 Alt 370. NNSA is closely coordinating with DoD, and delays to this weapons system are being discussed with the Navy.

B61-12 LEP

The B61 gravity bomb, with components dating from the 1960s, is the oldest weapon design in the U.S. nuclear stockpile. The B61-12 LEP refreshes obsolete technology and incorporates improvements in both safety and security features, and extends the life of the weapons system in the stockpile by at least 20 years. The B61-12 LEP will consolidate and replace the B61-3, -4, -7, and -10 bomb variants, reducing the overall number of gravity bomb types in the stockpile. The NWC also approved a revised FPU date of the 1st quarter of FY 2022 for the B61-12. Discussion of schedules that will meet deployment requirements have been coordinated with the Air Force. All other major components are continuing with production and readiness activities.

Production Infrastructure Modernization

While currently providing the warheads required by the DoD, the NNSA production infrastructure is neither responsive nor resilient. To help prevent against additional delays to the B61-12 LEP and the W88 Alt 370, as well as delays to other warhead modernization programs, NNSA must continue to upgrade its production infrastructure.

A number of NNSA's key facilities do not meet modern safety standards and require significant increased investment to maintain them. Safety and efficiency remain important concerns; if these facilities encounter a prolonged outage due to these mounting issues, the result will impact stockpile maintenance and warhead deliveries. As we consider the need for maintenance or replacement of any individual aging facility, we also need to recognize the time and planning required to accomplish upgrades or construction, which can be a decade or more.

Additionally, NNSA must re-establish a number of full-rate production capabilities to manufacture nuclear weapons components of strategic interest that need to be replaced. These key components, including primaries, secondaries, and radiation cases, are critical to weapon performance. Production of these components and the materials needed to construct them was reduced or stopped during the 1990s when they were no longer required, due to the Cold War ending. Conducting LEPs and a greater emphasis on a responsive manufacturing infrastructure now require restoring or increasing the capacity of these materials and component capabilities.

Workforce

Effective deterrence would be impossible without the vital contributions of NNSA's talented and dedicated workforce. NNSA must have a sufficient workforce, with the right capabilities, to ensure we can modernize the nuclear deterrent as well as carry out the full scope of NNSA's missions. To effectively accomplish our mission deliverables, including major modernization programs like the B61-12 LEP and the W88 Alt 370, NNSA's workforce must be aligned to meet the mission needs of today and those in the future.

NNSA's expanding and challenging national security missions require us to recruit, train, and retain a highly skilled and dedicated federal employee and M&O contractor workforce. A skilled federal workforce is required to execute appropriate program and project oversight as NNSA's NSE is busier than it has been since the end of the Cold War. Funding alone will not

accomplish this task; NNSA must continue to fully exercise its human resource authorities to attract, recruit, and retain its world-class workforce and provide its highly-talented men and women with the necessary tools to support their work.

Conclusion

NNSA's diverse missions are critical to the national security of the United States: maintaining the safety, security, reliability, and effectiveness of the nuclear weapons stockpile; reducing the threat of nuclear proliferation and nuclear terrorism around the world; and providing naval nuclear propulsion to the U.S. Navy's fleet of aircraft carriers and submarines.

NNSA is uniquely situated to deliver a safe, secure, and reliable nuclear weapons stockpile for the 21st century. NNSA continues to progress towards our milestones on every modernization program. Our efforts are closely coordinated with DoD to ensure we meet their requirements and integrate with their nuclear weapons delivery systems, while enhancing the safety and security of the Nation's stockpile.

By investing in NNSA's NSE and continuing our efforts to modernize our scientific, technical, and engineering capabilities and infrastructure, NNSA will continue to deliver on its nuclear security mission.

Charles P. Verdon
Deputy Administrator for Defense Programs

Dr. Charles P. Verdon is NNSA's Deputy Administrator for Defense Programs. He leads the team that directs the Stockpile Stewardship Program, which is responsible for maintaining the safety, security, and reliability of the Nation's nuclear weapons stockpile.

Confirmed by the Senate on Sept. 18, 2018, Dr. Verdon was sworn in on Oct. 9, 2018.

Prior to joining NNSA, he was the Principal Associate Director within the Weapons and Complex Integration Directorate at Lawrence Livermore National Laboratory. In this role, he was responsible for the management and coordination of all of the lab's weapons program activities.

Before that, Dr. Verdon served as the Directorate's Principal Deputy Principal Associate Director, Program Director for the Secondary Nuclear Design Program, and the AX-Division Leader. In these roles, he worked to maintain national and global security by maintaining scientific and technical leadership in all aspects of thermonuclear weapon physics design and operation. He was also responsible for the management of the scientific grand challenge effort of achieving ignition at the National Ignition Facility.

Dr. Verdon was selected as a Fellow of the American Physical Society in 1997. In addition, in 1995 the society awarded him the Excellence in Plasma Physics Research Award for outstanding theoretical work, computational design and analysis, and experimental work leading to quantitative and predictive understanding of aspects of high-energy density plasmas.

Dr. Verdon holds a doctorate in nuclear engineering from the University of Arizona.

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
STRATEGIC FORCES SUBCOMMITTEE

STATEMENT

OF

LIEUTENANT GENERAL RICHARD M. CLARK, USAF

DEPUTY CHIEF OF STAFF, STRATEGIC DETERRENCE AND
NUCLEAR INTEGRATION (AF/A10)

BEFORE THE

SUBCOMMITTEE ON STRATEGIC FORCES

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

B61-12 LIFE EXTENSION PROGRAM DELAY

25 SEPTEMBER 2019

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
STRATEGIC FORCES SUBCOMMITTEE

Good afternoon, Chairman Cooper, Ranking Member Turner, distinguished members of the Subcommittee. Thank you for the opportunity to discuss modernization efforts for the B61-12 gravity bomb. It is an honor to represent the Air Force before you today.

The return of Great Power competition means the United States faces a more diverse and advanced nuclear-threat environment than ever before. The 2018 Nuclear Posture Review highlighted that Russia has adopted military strategies and capabilities that rely on nuclear escalation for their success, which is a troubling doctrinal trend. Despite United States (U.S.) efforts to reduce the role of nuclear weapons in international affairs and to negotiate reductions in the number of nuclear weapons, neither Russia nor China have reduced the role of nuclear weapons in their national security strategies or the number of nuclear weapons they field. Rather, they have moved decidedly in the opposite direction. Over the last two decades, Russia and China have increased the prominence of nuclear capabilities in their doctrine, modernized their conventional, space, cyber, and nuclear arsenals, and engaged in anti-area/access denial strategies. In light of this, the U.S. must maintain a credible nuclear deterrent to ensure our ability to deter aggression, assure our allies and partners, hedge against technological uncertainties, and achieve U.S. objectives should deterrence fail.

Modernization and recapitalization are paramount to maintain a credible deterrent in the evolving strategic security environment. The 2018 Nuclear Posture Review calls for the Department of Defense (DoD) and the Department of Energy (DOE) to prioritize and fund their respective nuclear delivery systems and warhead programs to remain on schedule for synchronized delivery. The B61-12 life extension program (LEP) and Tailkit Assembly is one such effort and ensures the B61 meets United States Strategic Command (USSTRATCOM) and North Atlantic Treaty Organization (NATO) requirements well into the 21st century.

The B61-12 LEP extends the service life of the B61 by at least 20 years and maintains the capability to forward-deploy nuclear weapons with heavy bombers and dual-capable fighter aircraft in support of extended deterrence and assurance commitments to U.S. allies and partners. The addition of the Tailkit Assembly consolidates and replaces four B61 gravity weapon designs (B61-3, B61-4, B61-7, and B61-10), and improves safety and security at the same time.

The National Nuclear Security Administration (NNSA) has a crucial role to play as all of our nuclear programs require warheads developed and sustained by NNSA. NNSA is working

diligently to deliver assured, reliable capabilities on time to the warfighter. NNSA has identified an issue with capacitor components that did not meet reliability requirements and consequently, the B61-12 LEP and concurrent W88 Alteration 370 programs will not meet initial production date requirements. The Air Force is working with NNSA, USSTRATCOM, and NATO partners to understand and mitigate associated costs, near-term impacts to deployment, and any follow-on implications due to the delay to the B61-12 program. The Air Force Tailkit Assembly is unaffected by the delay and continues on schedule. Additionally, testing and other program activities will continue as planned in order to reduce risk in other areas as the Air Force awaits resolution of the capacitor issue.

Program delays are unfortunately a potential reality for any acquisition program; therefore, the Air Force is coordinating with stakeholders and partners to modify original deployment plans to meet combatant commander requirements and reduce risk with aging components. I am confident that the capacitor issue will be resolved through the efforts of DOE and DoD's skilled nuclear enterprise workforce, robust inspection and manufacturing processes, and solid industrial base. The Air Force will continue synchronizing efforts with the Navy, Office of the Secretary of Defense, and USSTRATCOM, working in lock step through the Nuclear Weapons Council to ensure that our nuclear modernization efforts support the nuclear triad, forward-deployed nuclear forces, and joint force requirements.

The Air Force values the continued support of Congress and the Nation. The U.S. requires the tools necessary to prevent the most existential threat to our survival as a nation. The flexible capabilities and complementary nature of the nuclear triad, forward-deployed nuclear forces, and associated nuclear weapons ensure the credibility of the U.S. deterrent while complicating an adversary's decision calculus. Our nuclear weapons and nuclear deterrence are the backstop of U.S. national security and underwrite every military operation on the globe, and we are committed to ensuring the successful modernization and recapitalization of these critical programs.

Lieutenant General Richard M. Clark

Lt. Gen. Richard M. Clark is Deputy Chief of Staff for Strategic Deterrence and Nuclear Integration, Headquarters U.S. Air Force, Arlington, Virginia. General Clark is responsible to the Secretary and Chief of Staff of the Air Force for focus on Nuclear Deterrence Operations. He provides direction, guidance, integration and advocacy regarding the nuclear deterrence mission of the U.S. Air Force and engages with joint and interagency partners for nuclear enterprise solutions.

General Clark graduated from the U.S. Air Force Academy in 1986. His commands include the 34th Bomb Squadron, Ellsworth Air Force Base, South Dakota, 12th Flying Training Wing, Randolph AFB, Texas, 8th Air Force and Joint Functional Component Commander for Global Strike, Offutt AFB, Nebraska. He has also served as the Vice Commander, 8th Air Force, Barksdale AFB, Louisiana, and Commandant of Cadets, U.S. Air Force Academy, Colorado Springs, Colorado. Prior to his current assignment, he served as the Commander, 3rd Air Force, Ramstein Air Base, Germany.

EDUCATION

1986 Bachelor of Science, Management, U.S. Air Force Academy, Colorado Springs, Colo.
1991 Squadron Officer School, Distinguished Graduate, Maxwell Air Force Base, Ala.
1994 Master of Arts, Human Resource Development, Webster University, St. Louis, Mo.
1996 U.S. Air Force Weapons School, Distinguished Graduate, Ellsworth AFB, S.D.
1998 Master of Strategic Studies, Naval Command and Staff College, Distinguished Graduate, Naval War College, Newport, R.I.
1999 Master of Airpower Studies, School of Advanced Air and Space Studies, Maxwell AFB, Ala.
2005 Master of National Security Studies, National War College, Distinguished Graduate, Fort Lesley J. McNair, Washington, D.C.

ASSIGNMENTS

May 1986-February 1987, Junior Varsity Football Coach and Candidate Counselor, U.S. Air Force Academy, Colorado Springs, Colo.
February 1987-February 1988, Student, Undergraduate Pilot Training, Laughlin Air Force Base, Texas
February 1988-November 1991, EC-135 Pilot, 2nd Airborne Command and Control Squadron, Offutt AFB, Neb.
November 1991-November 1994, B-1 Pilot, 28th Bomb Squadron, McConnell AFB, Kan.
November 1994-July 1997, B-1 Instructor Pilot, B-1 Flight Training Unit, 28th BS, Dyess AFB, Texas
July 1997-June 1998, Student, Naval Command and Staff College, Naval War College, Newport, R.I.
June 1998-June 1999, Student, School of Advanced Air and Space Studies, Maxwell AFB, Ala.
June 1999-August 2000, Action Officer, Air Force Office of Legislative Liaison, the Pentagon, Arlington, Va.
August 2000-August 2001, Fellow, President's Commission on White House Fellowships, Washington, D.C.
August 2001-May 2002, Assistant Director of Operations, 77th BS, Ellsworth AFB, S.D.
May 2002-May 2004, Commander, 34th BS, Ellsworth AFB, S.D.
May 2004-June 2005, Student, National War College, Fort Lesley J. McNair, Washington, D.C.
June 2005-January 2006, Vice Commander, 12th Flying Training Wing, Randolph AFB, Texas
January 2006-March 2008, Commander, 12th FTW, Randolph AFB, Texas
April 2008-April 2009, Director, Joint Interagency Task Force - Iraq, Multi-National Force - Iraq, Baghdad, Iraq
May 2009-July 2010, Vice Commander, 8th Air Force (Air Forces Strategic), Barksdale AFB, La.
July 2010-August 2012, Commandant of Cadets, U.S. Air Force Academy, Colorado Springs, Colo.
August 2012-August 2014, Senior U.S. Defense Official; Chief, Office of Military Cooperation; and Defense Attaché, Cairo, U.S. Central Command, Cairo, Egypt.
August 2014-April 2015, Vice Commander, Air Force Global Strike Command, Barksdale AFB, La.
April 2015-October 2016, Commander, 8th Air Force (Air Forces Strategic), Barksdale AFB, La., and

Joint Functional Component Commander for Global Strike, U.S. Strategic Command, Offutt AFB, Neb.
October 2016-October 2018, Commander, 3rd Air Force, Ramstein Air Base, Germany.
October 2018-present, Deputy Chief of Staff, Strategic Deterrence and Nuclear Integration, Headquarters U.S. Air Force, Arlington, Va.

SUMMARY OF JOINT ASSIGNMENTS
April 2008-April 2009, Director, Joint Interagency Task Force - Iraq, Multi-National Force - Iraq, Baghdad, Iraq as a colonel.
August 2012-August 2014, Senior U.S. Defense Official; Chief, Office of Military Cooperation; and Defense Attaché, Cairo, U.S. Central Command, Cairo, Egypt, as a brigadier general.
April 2015-October 2016, Joint Functional Component Commander for Global Strike, U.S. Strategic Command, Offutt AFB, Neb., as a major general.

FLIGHT INFORMATION
Rating: command pilot
Flight hours: more than 4,200
Aircraft flown: B-1, EC-135, KC-135, T-1, T-38, T-6 and C-21

MAJOR AWARDS AND DECORATIONS
Distinguished Service Medal with oak leaf cluster
Defense Superior Service Medal
Legion of Merit with oak leaf cluster
Distinguished Flying Cross
Bronze Star Medal with oak leaf cluster
Meritorious Service Medal with two oak leaf clusters
Air Medal with two oak leaf clusters
Aerial Achievement Medal
Air Force Commendation Medal with oak leaf cluster
Combat Action Medal
Nuclear Deterrence Operations Service Medal

EFFECTIVE DATES OF PROMOTION
Second Lieutenant May 28, 1986
First Lieutenant May 28, 1988
Captain May 28, 1990
Major Sept. 1, 1997
Lieutenant Colonel May 1, 2000
Colonel Aug. 1, 2004
Brigadier General Nov. 18, 2009
Major General June 4, 2013
Lieutenant General Oct. 21, 2016

(Current as of February 2019)

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
STRATEGIC FORCES SUBCOMMITTEE

STATEMENT

OF

VICE ADMIRAL JOHNNY WOLFE, JR, USN

DIRECTOR, STRATEGIC SYSTEMS PROGRAMS

BEFORE THE

SUBCOMMITTEE ON STRATEGIC FORCES

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

STATUS OF THE B61-12 LIFE EXTENSION

AND

W88 ALTERATION 370 PROGRAMS

25 SEPTEMBER 2019

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
STRATEGIC FORCES SUBCOMMITTEE

Chairman Cooper, Ranking Member Turner, and distinguished Members of the subcommittee, tbank you for this opportunity to discuss a vital refurbishment effort of our sea-based leg of the triad. It is an honor to testify before you representing the Navy's Strategic Systems Programs (SSP).

Nuclear deterrence is the Department of Defense's number one priority mission. The Nation's nuclear triad of intercontinental ballistic missiles, strategic bombers, and ballistic missile submarines (SSBNs) equipped with submarine-launched ballistic missiles (SLBM) is the bedrock of our ability to deter aggression, assure our allies and partners, achieve U.S. objectives should deterrence fail, and hedge against an uncertain future. Each leg provides unique attributes and, together, provides critical diversity and flexibility. Today's OHIO-Class submarine and the Trident II (D5) Strategic Weapon System together compose the sea-based leg of the deterrent. The SSBN provides an assured second strike capability and persistent at-sea presence; it is reliable, credible, and undetectable. The Trident II (D5) Strategic Weapon System provides 70 percent of the Nation's deployed deterrent; it is reliable, credible, and highly accurate.

The Trident II (D5) missile is capable of carrying and required to carry two different types of warheads—the W76 and the W88, deployed in the late 1970s and 1980s, respectively. Over the last 20 years, the Navy and our partners at the Department of Energy's National Nuclear Security Administration (NNSA) have executed efforts to refurbish these warheads to address aging and obsolescence and to ensure their continued availability to the Nation.

The challenges that the Navy and NNSA faced during the Navy's first Life Extension Program (LEP)—the W76-1 LEP—underpinned the efforts to plan the W88 Alteration 370 program and encouraged careful risk identification and mitigation efforts. This major alteration effort, begun in 2008, focused on procuring additional Arming, Fuzing, and Firing units and replacing the system's high explosives, in conjunction with a routine replacement of discrete system components. The W88 Alteration 370 will be executed as a stockpile turnaround, meaning that the units will be delivered from the Navy to NNSA as W88-0 warheads, and NNSA will return the refurbished units to the

Navy as W88 Alteration 370 units. Historical challenges delayed the initial program production until December 2019, removing schedule margin for this refurbishment effort. The Navy and NNSA have carefully orchestrated the turnaround of assets for the least disruption to the operational fleet while ensuring the Navy meets USSTRATCOM's warheads-at-sea requirements.

Recently during testing, NNSA identified an issue with capacitor components that did not meet reliability requirements and will not be available to this program or the concurrent B61-12 bomb LEP in order to meet required production dates. The Navy and NNSA are planning for an approximately 18-month delay to the W88 Alteration 370 program and are working to understand associated costs and the follow-on implications to our entire Trident II (D5) Strategic Weapon System Program of Record. Concurrently, the Navy is working with USSTRATCOM to understand the near-term impacts to deployments and to ensure that the Navy can continue to meet USSTRATCOM requirements as the schedule shifts. I am confident that the Navy, NNSA, and Nuclear Weapons Council (NWC) will work together to manage the delay, as we have historically addressed refurbishment challenges with a mission-focused attitude and rigor. The Navy will prioritize meeting our warfighters' requirements and minimizing disruption to the operational fleet to ensure that the sea-based leg of the triad continues to fulfill its deterrence mission.

Delays to warhead refurbishment programs are unfortunate, but they are a potential reality for which the Navy prepares contingency plans in close coordination with our partners and stakeholders. Issues associated with the W88 Alteration 370 program highlight the critical importance of a robust, nuclear enterprise-wide suite of skilled workforce professionals, rigorous processes, and a healthy manufacturing and industrial base. Now, more than ever, the Navy needs the continued support of Congress and the Nation as the Navy, NNSA, and the NWC work together to manage this delay.

Vice Admiral Johnny R. Wolfe, Jr.
Director, Strategic Systems Programs

Vice Adm. Johnny Wolfe is a native of Somerset, Texas. He graduated from the U.S. Merchant Marine Academy, Kings Point, New York, in 1988 with a Bachelor of Science in Marine Systems Engineering. He earned a Master of Science in Applied Physics from the Naval Postgraduate School in 1994, where he was also selected for transfer to the engineering duty officer community.

At sea and on deployment, he served as the assistant weapons officer on USS Lewis and Clark (SSBN 644) from 1988 to 1992, and was part of a forward-based team that led the rebuilding of courthouses and prisons in Iraq in 2007. In 1994 he was assigned as the lead systems engineer on a Ballistic Missile Defense Office (BMDO) joint skunkworks project ran by the U.S. Air Force at Kirtland Air Force Base, New Mexico.

From 1995 to 1996, he was assigned to Strategic Systems Programs (SSP) as the liaison to the Deputy Assistant Secretary of the Navy Command Control Communications Computers & Intelligence (C4I). From 1996 to 2000, he served as the assistant section head for fire control and guidance at SSP. In July 2000, Wolfe was assigned to the Program Management Office, Strategic Systems Programs (PMOSSP), Sunnyvale, California, where he served as the technical division head. During this tour, he was assigned additional temporary duties as a technical investigator for the Columbia Accident Investigation Board where he served as a lead for foam loss testing and orbit impact analysis. From 2003 to 2014, Wolfe was assigned back to SSP Headquarters. While at SSP he served in many positions, including the deputy chief engineer, branch head for Fire Control and Guidance Branch, the nuclear weapons security coordinator and SSGN coordinator, and branch head for Missile Branch.

In 2012, Wolfe assumed duties as the technical director and deputy director reporting program manager for Strategic Systems Programs. Wolfe was promoted to Rear Admiral October 1, 2014, and assigned as the program executive for Aegis Ballistic Missile Defense, Missile Defense Agency.

Wolfe was promoted to Vice Admiral on May 4, 2018 and assumed the duties as director, Strategic Systems Programs.

Wolfe's awards include the Defense Superior Service Medal, Legion of Merit, Bronze Star, Meritorious Service Medal with gold star, Joint Services Commendation Medal, Navy Commendation Medal with gold star, Navy Achievement Medal with three gold stars, Air Force Achievement Medal and various other service awards.

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

SEPTEMBER 25, 2019

QUESTIONS SUBMITTED BY MR. COOPER

Mr. COOPER. You noted in your testimony that NNSA is working to identify design simplifications in future warhead programs that may have on the order of $1 billion dollars in cost savings. Had the delays in the B61–12 and the W88 not occurred, would these design simplifications in the W80–4 and the W87–1 still have been pursued by NNSA? What are the specific design simplifications that will save $1 billion?Are the future modifications, alterations, and LEPs overfunded if $1 billion can so easily be found within them? When will NNSA formally provide Congress with this updated cost information?

Dr. VERDON. NNSA will attempt to balance the funding across all on-going weapon modernization activities to address B61–12 LEP and W88 Alt 370 funding needs. This approach will be challenging. NNSA is working to do this by utilizing remaining contingency and management reserve within the B61–12 LEP and W88 Alt 370 programs, and by applying lessons learned from these programs to reevaluate other on-going warhead activities for the potential of cost avoidance. The W80–4 LEP is already in Phase 6.3 so NNSA is looking at design/component simplification. The W87–1 Modification Program is in Phase 6.2 so NNSA, in coordination with the Department of Defense, is exploring both scope reductions (a normal part of the process in Phase 6.2) and design simplifications. Since no additional funding is required for the B61–12 LEP and W88 Alt 370 in Fiscal Year (FY) 2020, NNSA is working to understand our ability to carry out this approach in time for FY 2021 funding discussions.

Mr. COOPER. How will NNSA determine the extent to which the programs have sufficient contingency, given it is clear that neither the B61–12 nor W88 ALT 370 had sufficient contingency?

Dr. VERDON. NNSA provided contingency for both of these two programs at the start of each of their respective Phase 6.3 based on DOE/NNSA policy as informed by the DOE Office of Project Management and Oversight Assessment and Government Accountability Office best practice standards. As with any program of this complexity, contingency is utilized through the life of the program to address both previously assessed risks and unplanned realized risks.

The W80–4 Weapons Design Cost Report (WDCR) is very comprehensive, includes federal contingency, and is in close agreement with the Office of Cost Estimating and Program Evaluation's (CEPE) Independent Cost Estimate (ICE). While the program includes an estimate of contingency, CEPE's ICE utilizes historical actual data where contingency has been realized in principle. The W87–1 WDCR will follow the same comprehensive estimating process and, in accordance with NNSA's policies, will be reconciled with CEPE's independent estimate.

Mr. COOPER. You noted in your testimony that some organizational improvements have been identified as a result of the delays. Please specify, in detail, the identified improvements and a timeline for implementation.

Dr. VERDON. In October 2019, NNSA's Office of Defense Programs instituted a reorganization and realignment to account for the increased workload of future LEPs and to adjust for the W88 ALT 370 and B61–12 LEP schedule slips. To meet these challenges, this reorganization: Consolidates and manages all legacy and future weapons efforts under a single office; Realigns strategic materials and component production modernization efforts; Increases focus on production and integration of production efforts across the enterprise; Aligns technology maturation initiatives with research, development, test, and evaluation efforts under a single office.

Organizational changes are also being made at the relevant Management and Operating (M&O) contractors' sites. The federal program management team is being augmented with the addition of federally-led Integrated Product Teams focused on improving coordination and communications, both between the numerous M&O-led Product Realization Teams and up to federal program leadership. The M&O organizational changes are the responsibility of the individual sites, but are informed by the lessons uncovered by the NNSA review teams.

QUESTIONS SUBMITTED BY MRS. DAVIS

Mrs. DAVIS. Dr. Verdon, numerous reviews and assessments have been and are being conducted on NNSA's governance model. Recent reviews have noted the lack of clarity in roles and responsibilities within the enterprise, considering the cost and schedule delays of the B61–12 and the W88 ALT 370 programs, does NNSA plan to evaluate how to improve and clarify the roles and responsibilities within the enterprise? If NNSA is not planning to evaluate how to make improvements to these areas, please explain why in detail.

Dr. VERDON. In May 2019, NNSA released three strategic documents, which serve as the guiding principles for how NNSA does business. Collectively, these three documents, Strategic Vision, Strategic Integrated Roadmap, and Governance and Management Framework, set the stage for realizing the cultural changes necessary to ensure that NNSA continues to demonstrate excellence and is responsive to the nation's nuclear security and strategic defense needs now and into the future. These documents set the expectation that NNSA execute its mission based on clearly defined roles, responsibilities, authorities, and accountability, and work with single purpose through more effective teaming and improved mission integration. Clearly defined roles and responsibilities coupled with effective integration of operations drive collaboration, teamwork, communication, and efficiency across the nuclear security enterprise, resulting in peak performance and mission execution.

With respect to the B61–12 and W88 Alt 370, NNSA's Office of Defense Programs formed two teams to examine and document root causes and lessons from these delays. These teams determined that clarity regarding roles and responsibilities between the organizations involved was not a major factor. The respective organizations already had and continue to have an understanding of their roles and responsibilities. The teams identified that a more important contributing factor was how those roles and responsibilities were being executed, as well as the integration between the respective sites, Management and Operating (M&O) contractors, and federal program managers. NNSA is working with our M&Os to improve this integration.

Mrs. DAVIS. Dr. Verdon, the NNSA Act provides the Deputy Administrator with specific authority for "directing, managing, and overseeing the nuclear weapons production facilities and the national security laboratories." However, the field offices and many other critical support functions such as infrastructure, operations, and acquisition—which are necessary for delivering programs within their original performance baseline—reside outside of the Deputy Administrator's organizational purview.

Please specify, in detail, how you ensure each of the following mission support functions are integrated to meet the strategic direction of the Deputy Administrator: Field Offices; Infrastructure, Operations, and Safety, and Health; Acquisition and Project Management. Have any of the planned organizational and program changes, brought on by the delays, been formally approved by the Administrator?

Dr. VERDON. For major activities such as warhead modernization programs, NNSA works to ensure integration through both documented plans and frequent "face-to-face" meetings. This provides each relevant organization the information they need to enable the success of the program in question. The documented plans (and any changes to the plans) are coordinated between all relevant NNSA organizations and M&O contractors. Face-to-face meetings occur at all levels and frequency depending on need. For example, sites hold daily meetings to ensure workforce understanding of the activities planned for that day at that site. Leadership of the sites and Federal Managers hold weekly meetings at minimum to ensure that all sites understand what is ongoing and planned, and to ensure dependencies between each site are addressed. Quarterly, there is a day-long in-depth review of each project to provide further communication between all involved. Organizational changes are being made at the M&O partner sites, while the federal program management team is also being augmented with the addition of federally-led Integrated Product Teams. These teams are focused on improving coordination and communications between the numerous M&O lead Product Realization Teams and federal program leadership.

Mrs. DAVIS. Dr. Verdon, what, if any, modifications need to occur with respect to how NNSA manages technology and manufacturing maturing and readiness in light of the delays?

Dr. VERDON. One of the key lessons NNSA has learned from our review of the delays is the need to modify our manufacturing and technology readiness. NNSA is putting into place a number of changes to minimize the chance of recurrence of the issue encountered with these two programs in the future. For example, three changes being implemented are:

1) NNSA has consolidated all technology and manufacturing readiness/maturations efforts (TRLs and MRLs), outside of specific weapons program modernization activities, under one program office. These activities had previously been distributed among a number of organizations. This consolidation enables a more strategic and integrated approach.

2) For any new technology and/or components proposed for use in a warhead modernization activity, NNSA has moved the assessment that decides if the use of new technology will be supported to earlier in the 6.X process, prior to entering Phase 6.2. We have also increased the level of assessment needed. Of course, NNSA recognizes that in some cases a new technology might offer some significant potential benefits, and on a case-by-case basis the use of new technology will be supported, but risk mitigations must be identified and pursued in parallel.

3) NNSA has implemented more rigorous and frequent independent assessments of technology and manufacturing readiness levels to assess the progress of key components and to provide an additional indicator as to whether TRLs or MRLs are falling behind their needed dates for use, so that corrective actions can be taken in a timely manner.

QUESTIONS SUBMITTED BY MR. LARSEN

Mr. LARSEN. If NNSA plans to shift contingency from the W80–4 and W87–1 to the B61–12/W88 Alt 370, will this shift be commensurate with the planned simplifications of these programs designs? What are the current contingency amounts for the W80–4 and the W87–1?

Dr. VERDON. NNSA will attempt to balance the funding across all on-going weapon modernization activities to address B61–12 LEP and W88 Alt 370 funding needs. This will not be done by shifting contingency from the W80–4 LEP or W87–1 Modification Program. NNSA plans to do this by utilizing contingency and management reserve within the B61–12 LEP and W88 Alt 370 and by applying lessons from both to reevaluate other ongoing warhead activities for the potential of cost avoidance through design/component simplifications and scope reductions. The W80–4 LEP is already in Phase 6.3; therefore, NNSA is looking at design/component simplification for that program. The W87–1 Modification Program is in Phase 6.2, so NNSA, in coordination with the Department of Defense, is exploring both design simplifications and scope reductions— a normal part of Phase 6.2. Since no additional funding is needed for the B61–12 LEP and W88 Alt 370 in Fiscal Year (FY) 2020, NNSA intends to have additional details on the potential cost avoidance that can be identified in the W80–4 LEP and W87–1 Modification Program in time to inform FY 2021 budget/funding discussions.

The FY 2020 contingency for the W80–4 is $20 million, which is 2.2% of the FY 2020 budget. The W87–1 is in early development stage and has not established a baseline. Therefore, no contingency reserve is allocated.

Mr. LARSEN. Within the NNSA enterprise, who is responsible for deciding when specific tests, such as the tests that identified the issues causing delays, are done on warhead components?

Dr. VERDON. It is the responsibility of the design laboratory of the component in question working with the relevant production site to identify what and when tests are needed to provide the underpinning evidence that components meet requirements.

Mr. LARSEN. When were you and the Administrator made aware of potential issues with the capacitors?

Dr. VERDON. The technical issue with the parts in question was confirmed in April 2019, but the full extent and impact was still under investigation at that time. In June 2019, the full extent, path forward to fix, and potential impacts to the B61–12 LEP and W88 Alt 370 delivery timelines were identified.

In 2014, the components in question were identified for use in both systems. Between 2014 and 2018, testing of the components did not show failures. However, in December 2018, NNSA was informed of the first reported failure of one of the capacitors in question. The initial failure occurred in December 2018 under extended life testing by a testing vendor utilized by the Kanas City National Security Campus. Between February 2019 and April 2019, Sandia National Laboratories repeated those tests, confirming the failure, and conducted numerous other tests to understand the extent of the issues. The full extent of the issues, the path forward to fix the issues, and the potential impacts to warhead delivery timelines were not established until June 2019.

The Administrator and I were formally notified in April 2019 that the Sandia testing verified the single failure seen previously. We were again formally notified in

June 2019 as to the extent, the path forward to address the issues found, and the resulting delays to the two programs. NNSA personnel, along with personnel from the Air Force and Navy were involved throughout the process. In May 2019, NNSA notified Congress that technical issues were encountered on the B61–12 LEP and the W88 Alt 370 that could result in delays, but the full extent was not known at that time. Since then, in August 2019, NNSA provided an update to Congress as information became available regarding First Production Unit dates, resulting warhead delivery dates, and a first estimate as to the cost impacts due to these delays. NNSA will continue to provide updates to Congress during quarterly program reviews of these programs.

Mr. LARSEN. What additional costs will there be to the Air Force due to the delay in B61–12 First Production Unit and when will the Congress be formally notified of any additional costs? Will the delays affect delivery of the warheads to NATO? If so, how?

General CLARK. There are no additional costs to the Air Force due to the delay. All costs are incurred by the National Nuclear Security Administration (NNSA). The delays resulted in a slip in First Production Unit schedules which will affect delivery of the warheads to both United States Strategic Command (USSTRATCOM) and United States European Command (USEUCOM). However, the Air Force has coordinated with NNSA, USSTRATCOM, and USEUCOM to adjust B61–12 deployment.

QUESTIONS SUBMITTED BY MR. GARAMENDI

Mr. GARAMENDI. Are the Navy and NNSA considering a new warhead design for the Next Navy Warhead?

Dr. VERDON. The detailed requirements for a Next Navy Warhead are still in development within the Department of Defense. It is too early in the process to provide any details regarding what type of warhead will be required to meet U.S. Strategic Command and U.S. Navy needs.

Mr. GARAMENDI. NNSA has identified a need to hire additional FTEs with federal program management expertise in the Office of Defense Programs and in other critical mission support areas. Please specify how NNSA is making full use of its current Excepted Service authorities to hire additional Federal program management expertise. Would additional federal FTEs decrease risk of delays and cost overruns within LEP programs?

Dr. VERDON. NNSA has continued to hire additional FTEs within the Office of Defense Programs and in other mission support areas at the request of hiring managers by utilizing our Excepted Service (EN) appointing authority.

In Fiscal Year (FY) 2019, NNSA filled 99 positions externally under the EN authority. Out of our allocation of 600 authorized EN FTE, NNSA is currently at 597. To continue leveraging the EN appointing authority, NNSA balances the start date of new EN employees with Agency separation dates for departing or retiring EN employees. NNSA provided technical assistance drafting legislative language to remove the statutory cap on NNSA's EN authority so that it can be used to hire the program management professionals needed to manage the programs.

As part of the root cause analysis and lessons learned from this delay, NNSA's Office of Defense Programs identified the need for additional federal project management and oversight staff on each of the respective weapons modernization programs. This need for additional federal FTEs in the Office of Defense Programs is consistent with two independent staffing studies conducted by the Office of Personnel Management (OPM) and NNSA's Office of Cost Estimating and Program Evaluation. NNSA is actively recruiting to fill these positions.

Mr. GARAMENDI. Are the Navy and NNSA considering a new warhead design for the Next Navy Warhead?

Admiral WOLFE. At this time, the Navy and NNSA are considering warhead designs for the Next Navy Warhead that will leverage existing proven design elements (i.e., designs that have undergone underground testing).

Mr. GARAMENDI. What additional costs will there be to the Navy due to the delay in the W88 Alt 370 and when will the Congress be formally notified of any additional costs?

Admiral WOLFE. The Navy and NNSA are continuing to evaluate the budgetary implications of an anticipated 19-month delay due to capacitor issues. At this time, we are assessing how the delay may potentially increase Navy-funded workload at NNSA and our national laboratory partners and as well as additional costs related to limited life component exchanges and surveillance support. The Navy will continue to work with the DOD within the resource allocation process as we assess the

potential impacts of the delay. Should the impacts require assistance outside the normal process, the Department will properly notify Congress.

QUESTIONS SUBMITTED BY MS. HORN

Ms. HORN. Dr. Verdon, how will working on the ongoing programs for longer at Kansas City affect workload at Pantex and delay start to W80–4 (and potentially W87–1) at Kansas City?

Dr. VERDON. NNSA has identified a path forward to rebalance work at Pantex due to this delay. NNSA continues to assess the impacts of the delays in the B61–12 LEP and W88 Alt 370 on the W80–4 LEP and W87–1 Modification Program. Once this assessment is completed, NNSA will inform stakeholders of the results and will identify any impacts to other ongoing warhead modernization activities.

Ms. HORN. Dr. Verdon, you note in your testimony that NNSA has moved to procuring around 70% of warhead components from commercial vendors. Given recent issues, have NNSA's assumptions about the use of COTs changed for future warhead programs? If so, how would this affect floor space and other needs at Kansas City? Would infrastructure and production support costs increase? Also, at the time that NNSA shifted its strategy to purchase more COTS, what additional steps did it take to ensure the quality of purchased components? Describe in detail how these steps have been found now to be insufficient.

Dr. VERDON. NNSA has determined that the use of COTs is still a viable approach for our weapons modernization programs, but requires a modification to the approach for implementation that existed at the start of the B61–12 LEP and W88 Alt 370. As part of the lessons learned from the B61–12 LEP and W88 Alt 370, NNSA is modifying our approach to the continued use of COTs in weapon warhead modernization programs. These changes include: Earlier and more frequent interactions with the vendors to ensure they understand NNSA's requirements for the use of their components and NNSA understands their ability to provide the parts to meet our requirements. On a case-by-case basis, if no vendor can be identified to provide the needed parts/component, design requirements cannot be reasonably altered to accommodate available commercial parts, and NNSA is not able to support or establish commercial sources of supply, then NNSA will bring the production of those components in-house. Increased and earlier testing of purchased COTs parts to ensure requirements are being met and lot-to-lot variations are assessed. Development of an approved COTs parts/vendor catalog with the requirement that if a previously approved vendor/part was shown to meet requirements it will be used in new applications. Further, if the design or production site wants to use a new component for ostensibly the same application, the justification for this will need to be reviewed. Since the original time of the selection of the parts now in question (2014), improved Military Performance Standards have been established that help to ensure that parts identified will meet NNSA's warhead life requirements.

When NNSA decided to place more reliance on the use of COTS parts, our Management and Operating (M&O) contractors created a COTS parts use and qualification methodology. This methodology was based on best engineering practices of the time and was shown to be adequate in the past. The B61–12 LEP, due to the complexity of the warhead and its requirements, represented the first warhead modernization program requiring the use of a much larger number of COTS components. A key shortcoming in the original methodology was an underestimation of the potential lot-to-lot variations that could occur in COTS parts production.

Workload increases require the identification of additional manufacturing/production floor space at a number of NNSA's M&O sites. NNSA is working with the Kansas City National Security Campus and Sandia National Laboratories to execute plans to identify and provide this space in time to support all of our currently ongoing warhead modernization programs.

○