Advance Policy Questions for Charles Verdon
Nominee for Deputy Administrator for Defense Programs,
National Nuclear Security Administration

Duties and Qualifications

What background and experience do you possess that qualify you to perform the duties of the Deputy Administrator for Defense Programs of the National Nuclear Security Administration (NNSA)?

I believe my background and experiences provide leadership and technical knowledge and abilities important to fulfilling the position of Deputy Administrator for Defense Programs of the National Nuclear Security Administration. I currently hold the position of Principal Associate Director within the Weapons and Complex Integration Directorate at Lawrence Livermore National Laboratory since May 2013. In this role, I am responsible for the management and coordination of the nuclear weapons program activities within Lawrence Livermore National Laboratory. Prior to this position, I was the Principal Deputy Principal Associate Director within the Weapons and Complex Integration Directorate starting in November 2009 and Program Director for Secondary Nuclear Design Program and the AX-Division Leader, a position assumed in October 2003. In this role, I was responsible for the management of the Laboratory's Secondary Nuclear Design Program whose mission is to ensure national and global security by maintaining scientific and technical leadership in all aspects of thermonuclear weapon physics design and operation. As the AX Division Leader, I was responsible for the management of a scientific effort that is at the core of the Secondary Nuclear Design Program and the scientific grand challenge effort of achieving ignition at the National Ignition Facility.

Prior to my arrival at Lawrence Livermore National Laboratory, I started my professional career as an individual technical contributor at the Laboratory for Laser Energetics at the University of Rochester moving into technical management first as the Director for the Division of Theory (January 1991 – September 1994) and then as the Deputy Director (October 1994 – November 1997). As Deputy Director, I was responsible for the development and coordination of an integrated theoretical and experimental effort into the direct-drive approach to inertial confinement fusion ignition.

If confirmed, I believe my extensive professional experience directly relates to the mission and management of the NNSA's Office of Defense Programs.

Do you believe that there are any steps that you need to take to enhance your expertise to perform the duties of the Deputy Administrator for Defense Programs?

Based on my 30 years of experience in the nuclear security complex, I believe I am ready to assume this position. However, I believe strongly in continuous learning to ensure new and innovative solutions. I look forward to engaging across DOE and NNSA to deepen my understanding of NNSA capabilities and requirements.

Major Challenges and Priorities

What are the major challenges confronting the next Deputy Administrator for Defense Programs of NNSA?

I believe the major challenges include ensuring NNSA and the Office of Defense Programs maintain the unique expertise and capabilities to support current and future stockpile requirements, preparing the nuclear weapons complex to address the national security challenges of the 21st century, and securing the necessary resources to do so. Further, much of NNSA's infrastructure is decades old. Modernizing NNSA's aging infrastructure must remain a long-term priority to ensure we are able meet NNSA mission requirements.

If confirmed, how would you address these challenges?

I will work with NNSA Administrator Gordon-Hagerty, the laboratories, and production sites, to promote the nuclear security enterprise to recruit, retain, and develop the highly skilled workforce needed for maintaining the U.S. nuclear weapons stockpile. If confirmed, I will work with my colleagues and leadership, within NNSA and the Department, to ensure the long-term challenges of modernizing NNSA's infrastructure continue to be addressed.

If confirmed, what would be your main priorities for the Office of Defense Programs?

If confirmed, one of my primary priorities will be doing what is necessary to maintain a safe, secure, and effective nuclear deterrent and the tools, facilities, and expertise that underpin it. Further, I will work to ensure NNSA and the Office of Defense Programs meets the nuclear and national security needs of our Nation.

Relations with Congress

What are your views on the state of the relationship between the Deputy Administrator for Defense Programs and the Senate Armed Services Committee in particular, and with Congress in general?

I understand NNSA and the Office of Defense Programs have a good relationship with the Committee.

If confirmed, what actions would you take to sustain a productive and mutually beneficial relationship between Congress and the Deputy Administrator for Defense Programs?

Transparent and open communication is key to maintaining a successful relationship. If confirmed, I am committed to ensuring regular access and communications with the Committee and Congress continues.

Nuclear Posture Review Implementation

The Department of Defense recently released the 2018 Nuclear Posture Review (NPR), which was written in partnership with NNSA and the State Department. The NPR made several policy recommendations for NNSA programs, including the modification of a small number of sea-launched ballistic missile warheads for low-yield, the acceleration of the first interoperable warhead program by a year, and the sustainment of the B83-1 past its currently planned retirement date. The NPR also supported the planned revitalization of the NNSA complex, including infrastructure and personnel.

If confirmed, will you work with the Department of Defense to implement all of the recommendations of the NPR to the best of the ability of NNSA?

Yes. If confirmed, I will ensure that NNSA maintains a close and effective relationship with the Department of Defense to ensure we collectively meet our nation's nuclear security priorities.

Relationship with the Department of Defense

If confirmed, you will support the Administrator of NNSA in her role as a member of the Nuclear Weapons Council. The Council sets requirements for nuclear forces, which form the basis of the core mission of NNSA. The Department of Defense is, in a sense, NNSA's primary customer.

How would you assess the relationship between NNSA and the Department of Defense at senior levels?

My assessment is a positive one and, if confirmed, I look forward to fully supporting the Administrator.

How would you assess this relationship at working levels? How would you assess collaboration at the action officer level currently?

I have not had an opportunity to regularly or closely observe daily interaction at the action officer level, but what I have observed is a positive tone set by the NWC principals.

Specifically, how would you assess the relationship between the office you have been nominated to lead and the office of the Assistant Secretary of Defense for Nuclear,

Chemical, and Biological Programs, the closest equivalent in the Department of Defense?

I do not have visibility into the existing relationship. To ensure success, I believe both of the offices must have a respectful, cooperative relationship. If confirmed, I intend to regularly communicate and partner with my colleagues at the office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Programs.

What steps would you recommend to improve these relationships?

If confirmed, I will work to strengthen this relationship through a commitment to open communications and collaborations.

Do you believe that NNSA is adequately responsive to the requirements set by the Department of Defense?

Yes.

Defense Programs

The Stockpile Stewardship Program has supported the annual nuclear weapons certification effort for the last 20 years.

Do you believe that we currently have the capabilities to ensure that the stockpile is safe, secure, and reliable without nuclear weapons testing?

At present, yes. I understand the United States remains committed to a moratorium on nuclear testing, while continuing to review the Comprehensive Test Ban Treaty.

The Nuclear Weapons Council has laid out a schedule for the next 20 years that includes the completion of four life extension programs (LEPs), as well as multiple refurbishment programs, the interoperable warheads, and the maintenance of the existing stockpile. The 2018 NPR directed NNSA to develop a "roadmap that sizes production capacity to modernization and hedging requirements," presumably at least partially to help manage this list of programs.

Do you have any concerns with this ambitious schedule?

The workforce of the nuclear security enterprise is highly-skilled and mission-focused. While there is risk in the schedule, I remain confident that if priorities are appropriately balanced with predictable and stable funding, critical programs will be delivered.

If confirmed, do you commit to an ongoing and open dialogue with Congress on the progress and content of the roadmap directed by the NPR?

Yes.

The NPR also noted the need for increased flexibility, including measures to "reduce the time required to design, develop, and initially produce a warhead, from a decision to enter full-scale development."

If confirmed, what measures would you recommend in order to reduce this timeline, both for currently planned life extension programs and for future programs?

If confirmed, I believe success will require strengthening the capabilities base of the nuclear security enterprise – including people, facilities, equipment, science, engineering, computing, technology, materials, production, manufacturing processes, and business practices. Stable and predictable funding is paramount to these efforts.

Congress has authorized the Stockpile Responsiveness Program for the last several years in order to exercise design and engineering skills in support of the nuclear weapons mission, but this authority has not been fully utilized by NNSA. The 2018 NPR directed NNSA to "[r]apidly pursue the Stockpile Responsiveness Program."

If confirmed, would you support the Stockpile Responsiveness Program and make full use of the authorities it provides NNSA?

Yes.

The fiscal year 2019 budget request makes substantial cuts to the Inertial Confinement Fusion (ICF) Ignition and High Yield line. You have an extensive background in this subject from your years of work at the Laboratory for Laser Energetics and at Lawrence Livermore National Laboratory. The remaining ICF funds prioritize direct support to the stockpile over longer-term research and investment, such as efforts to achieve ignition.

In your opinion, is this an appropriate tradeoff to be made, keeping in mind the constraints of NNSA's topline and the priorities of the organization?

The Inertial Confinement Fusion Ignition program has led to gains in knowledge and improved confidence in the nuclear weapons stockpile, helping to enable the annual assessment and certification of the nuclear stockpile. Given that there are always more requirements than there is funding the balancing of near-term versus longer-term deliverables is a constant activity within the Stockpile Stewardship Program. By the proposed actions beginning in FY2019, NNSA is moving toward ensuring nearer-term deliverables in support of the on-going stockpile modernization. If confirmed, I will work to ensure NNSA continues to assess the priorities and sustains the capabilities necessary to assess and certify the stockpile.

Defense Programs Budget

In 2015, then-Secretary of Energy Ernest Moniz wrote in a letter to the Director of the Office of Management and Budget (OMB) regarding NNSA's budget allocation for the next five years that "an additional $5.2 billion over FY 2018-2021 [was] needed to establish a viable and sustainable program portfolio" and that "[f]ailure to address these requirements in the near term will put the NNSA budget in an untenable position beginning in FY 2018." He added that, uncorrected, the budget proposal would "lack credibility."

More recently, the 2018 NPR noted the presence of "significant infrastructure funding shortfalls [at NNSA] over the next five years" that will need to be addressed in order to meet the needs of the nuclear enterprise. NNSA received an approximately 8% increase in funding in the fiscal year 2019 request over the fiscal year 2018 request, and expects to receive another similar increase in fiscal year 2020.

Do you believe these increases are sufficient to meet the funding shortfalls identified by the NPR, former Secretary Moniz, and many others previously?

The work-scope of NNSA has increased and the nuclear security enterprise is the busiest it has been in decades. While additional funding to meet added work-scope may be necessary, if confirmed, I will assess what resources may be required to meet NNSA's increasing mission requirements.

If so, what are the specific areas in NNSA's Office of Defense Programs that will need to be supported at higher levels in the out-years?

If confirmed, I will take a deeper look and more fully assess the current allocation of resources and work to make any necessary adjustments.

Personnel

Do you believe that the Office of Defense Programs has the appropriate number of civilian employees to perform its mission?

To meet key national security deliverables, it is essential the Office of Defense Programs have the appropriate federal workforce in place to expertly manage programs, collaborate with the laboratories and production plants, and exercise proper oversight. If confirmed, I will assess the strength and readiness of the workforce and ensuring that the Office of Defense Programs has the resources required to accomplish its mission.

If not, what would be the appropriate size of the civilian staff and what would the additional personnel be able to accomplish that NNSA is not able to accomplish today? Which components would you recommend growing?

If confirmed, I will work to ensure the Office of Defense Programs is resourced to accomplish its growing mission. To that point, I would focus on rigorous program and project management and prioritize the core modernization activities.

What are the biggest challenges to recruiting, training, and retaining civilian and contractor personnel in this area?

The workforce is essential to everything the nuclear security enterprise is tasked with completing. The complex must be able to offer the existing and future workforce opportunities to utilize and develop critical skills and capabilities. Challenging the workforce to advance and sustain these critical skills and capabilities is required in order to meet future stockpile and NNSA mission requirements.

If confirmed, what specific steps would you take to retain critical nuclear weapons expertise in both NNSA federal civilians and the contractor workforce?

I value the federal, contractor, civilian, and military workforce who contribute to the success of the nuclear security enterprise every day. Without their expertise and dedication to the mission, the complex would not be able to accomplish its mission requirements. If confirmed, I will explore opportunities to retain critical nuclear weapons expertise through advancing key partnerships, academic alliances, and leadership and professional development initiatives to support the workforce.

Facilities and Infrastructure

More than half of NNSA's infrastructure is over 40 years old, and a quarter dates back to the Manhattan Project. As former Administrator Frank Klotz said in 2017, "If not appropriately addressed, the age and condition of NNSA's infrastructure will put NNSA's missions, safety of its workers, the public, and the environment at risk." In the National Defense Authorization Act for Fiscal Year 2018, Congress directed NNSA to establish the Infrastructure Modernization Initiative to reduce the backlog of deferred maintenance and repair needs by at least 30% by 2025.

If confirmed, how would you work with the Associate Administrator for Safety, Infrastructure, and Operations in order to prioritize within the Office of Defense Programs' portfolio of infrastructure requiring maintenance?

If confirmed, I will coordinate closely with the Associate Administrator for Safety, Infrastructure & Operations to ensure the Office of Defense Programs priorities are communicated and understood.

If confirmed, what measures would you recommend in order to reduce risk in future major construction projects related to the Office of Defense Programs, such as the lithium, tritium, and domestic uranium enrichment capabilities?

If confirmed, I will work to ensure robust program and project management and oversight of these critical programs to reduce risk. I will coordinate with the laboratories and production plants to establish and communicate priorities in order to minimize and reduce risks. And, I will work closely with the Office of Acquisition and Project Management (APM) on ensure their rigorous processes are executed.

Plutonium Strategy

The capacity for plutonium pit production is essential for maintaining U.S. nuclear capabilities, as well as for the Stockpile Stewardship Program. The entire pit production capacity in the United States currently resides at Plutonium Facility 4 (PF-4) at Los Alamos National Laboratory, which is aging and too small to support the pit production milestones established by the Nuclear Weapons Council and codified by section 4219 of the Atomic Energy Defense Act (50 U.S.C. 2538a). As the 2018 NPR stated, "the United States does not have a sustained plutonium pit manufacturing capability needed to avoid stockpile age-out, support life extension programs, and prepare for future uncertainty."

Over the last 20 years, NNSA has started and stopped multiple projects intended to recapitalize this capacity, including the Modern Pit Facility and the Chemistry and Metallurgy Research Replacement Nuclear Facility (CMRR-NF) project. After CMRR-NF was cancelled in 2014 following more than $400 million of design work, the Defense Department's Office of Cost Assessment and Program Evaluation (CAPE) conducted a business case analysis that pointed to modular buildings as a promising way forward for pit production. Yet the Plutonium Modular Approach Analysis of Alternatives (AoA) conducted by NNSA over the last two years did not give full consideration to modules as an alternative. The AoA also indicated that none of the options considered were likely to meet the 2030 milestone set by the Nuclear Weapons Council and Congress.

Are you concerned that NNSA may be unable, under any of the fully analyzed alternatives, to meet the pit production milestones set by the Nuclear Weapons Council?

It is imperative for the nuclear security enterprise to meet pit production requirements. If confirmed, I will ensure NNSA works to meet the Nuclear Weapons Council's pit production requirements. The ability to produce components for the nuclear weapons stockpile is essential to the Nation's deterrent, and the ability to produce plutonium pits is critical.

What steps would you recommend to mitigate this risk?

If confirmed, I look forward to the opportunity to assess options to reduce and, as appropriate, mitigate risk in order to sustain and advance the capability for the Nation to produce plutonium pits.

The 2018 NPR directed NNSA to "[p]rovide the enduring capability and capacity to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030," and added that a "delay in this would result in the need for a higher rate of pit production at higher cost."

Do you agree that delays in meeting the pit production milestones will result in cost growth as well as risk to the mission?

It is essential for the nuclear security enterprise to be able to meet validated military requirements established by the Nuclear Weapons Council. If confirmed, I will work to meet these requirements as expeditiously and cost-effectively as possible.

What steps would you recommend to help recruit and retain the extremely specialized personnel that will be required to meet the plutonium mission as NNSA ramps up production capability throughout the 2020s at PF-4 and prepares to staff the preferred alternative by 2030?

If confirmed, I intend to review existing plans and strategies to recruit and retain the specialized workforce required to meet the plutonium mission. I would also leverage the national laboratories, production plants, and management & operating contractors to implement any necessary modifications to both support the existing workforce while recruiting for the workforce of the future.

Section 3141 of the National Defense Authorization Act for Fiscal Year 2018 requires the Chairman of the Nuclear Weapons Council to certify to the congressional defense committees that the recommended alternative proposed by NNSA meets the requirements of the Secretary of Defense for plutonium pit production capacity as well as certain other requirements. If the Chairman has not done so by mid-May 2018, section 3141(d) requires NNSA to carry out the modular building strategy as defined in section 3114(c)(3) of the National Defense Authorization Act for Fiscal Year 2013 and supported by the CAPE business case analysis.

If confirmed, do you commit to complying with the law, as enacted in section 3141 of the National Defense Authorization Act for Fiscal Year 2018?

Yes.

If confirmed, do you commit to maintaining full and open communication with the relevant congressional committees and with the Department of Defense regarding the AoA, the follow-on Engineering Analysis, and the selection of the preferred alternative?

Yes.

<u>Uranium Strategy and Tritium Production</u>

The U.S. government currently requires low-enriched uranium (LEU) in order to produce tritium, as well as for research and isotope production reactor fuel. The Department of Energy (DOE) has maintained as policy that only unobligated LEU can be used for national security purposes, meaning that neither the uranium nor the technology used to enrich it carries an "obligation" from a foreign country requiring that the material be used for only non-weapons purposes. Since USEC ceased enrichment operations in 2013, DOE has relied upon downblending recycled high-enriched uranium (HEU) to meet requirements for unobligated LEU, but the available supply of recycled HEU for downblending is finite. The United States does not currently have an indigenous uranium enrichment capability.

According to the Government Accountability Office (GAO), NNSA issued a Mission Need Statement in late 2016 that declared the need for a domestic uranium enrichment capability, but did not specify whether that capability was exclusively for tritium production or for all national security purposes. NNSA recently began an analysis of alternatives (AoA) that is expected to take three years. According to the GAO report, this AoA will compare a narrow range of uranium enrichment capabilities, but will not address other ways to meet tritium needs and therefore change the enriched uranium requirements.

Do you believe NNSA should build a future capability to address LEU for tritium production only, or for all national security purposes?

If confirmed, I intend to carefully consider the most effective ways to ensure steady, reliable access to key strategic nuclear materials, including tritium and LEU. These materials are vital for national security and a successful nuclear deterrent.

NNSA is the lead U.S. agency for establishing requirements under the Mutual Defense Agreement between the United States and the United Kingdom to share research and material in support of each other's nuclear deterrent.

If confirmed, would you investigate the feasibility of using this agreement to have the United Kingdom provide unencumbered LEU to the United States and report back promptly on your findings to this Committee?

If confirmed, I will work to exercise the authorities of the Mutual Defense Agreement necessary to meet mission requirements and advance collaboration between the United States and the United Kingdom.

The 2018 NPR noted that tritium production is now "insufficient to meet the forthcoming U.S. nuclear force sustainment demands," and added that "a marked increase in the planned production of tritium in the next few years" will be required in order to prevent the atrophy of our nuclear capabilities below requirements.

In your opinion, is NNSA's current tritium strategy, in terms of quantity and schedule, sufficient to support such a marked increase?

Tritium production is vital to ensuring a reliable nuclear weapons stockpile. If confirmed, mitigating challenges and minimizing risk will be among my top priorities for tritium.

Do you believe NNSA should be investigating alternative tritium production methods besides the current program of providing material for the Tennessee Valley Authority to irradiate in the Watts Bar reactors?

The capability to produce tritium is essential to the maintenance of a reliable nuclear weapons stockpile. If confirmed, I intend to carefully consider the most effective way to ensure a reliable source of tritium.

Regulation and Oversight

Staff at NNSA's national laboratories often complain that they are overburdened by regulation and oversight, both internal and external, and that this contributes to the challenges in staying under cost and on schedule for major projects.

Do you believe that environmental, safety, and construction regulations are properly applied to NNSA projects and operations?

Mission success demands environmental, safety, and construction regulations that protect employees, the environment, and surrounding community. I believe that NNSA processes must ensure early identification and integration of safety systems and controls in project design, and controls that are validated throughout construction. These actions are critical to reducing rework and controlling costs during design and construction.

I believe DOE directives are based on extensive experience with nuclear operations and inherently hazardous work. DOE and NNSA have incorporated best practices and lessons learned to improve and streamline these directives, but we need to build and improve on these successes moving forward.

In your opinion as someone who has spent most of his career at the laboratories, do these regulations serve the labs and the country well?

Continuous improvement is necessary to appropriately balance governance and oversight with meeting NNSA's mission deliverables effectively and efficiently.

I believe NNSA has a good safety record overall and continuously strives for improvement. In my opinion, NNSA is making notable improvement in the governance and management of its sites.

Do you believe the labs are subject to the appropriate level of oversight from NNSA, DOE, the Defense Nuclear Facilities Safety Board, GAO, and/or Congress?

As a scientist, I believe strongly in peer review. NNSA has a strong relationship with and provides sound oversight of its management and operating partners. Relationships with these stakeholders provide NNSA unique insights that aid in the resolution of challenges in an efficient and timely fashion.

During my tenure within the complex, I have seen NNSA make changes to improve its oversight model. I believe effective governance requires all involved parties to accept accountability within their areas of responsibility. Finding ways to improve is always necessary. If confirmed, I will look for ways in which to ensure mission success and effective oversight.

If confirmed, are there any changes in regulatory or oversight structures based on your experience that you would recommend?

I believe a strong governance and management structure that works within a healthy culture is critical for NNSA's continued success of its national security mission. If confirmed, I will work with my peers across NNSA's enterprise to assess if changes are required.

Notification of Congress

If confirmed, will you work with the Administrator of NNSA to notify Congress promptly of any significant issues in the safety, security or reliability of the nuclear weapons stockpile?

Yes.

Congressional Oversight

In order to exercise its legislative and oversight responsibilities, it is important that this Committee and other appropriate committees of Congress are able to receive testimony, briefings, and other communications of information.

Do you agree, if confirmed, to appear before this Committee and other appropriate committees of Congress?

Yes.

Do you agree, if confirmed, to appear before this Committee, or designated members of this Committee, and provide information, subject to appropriate and necessary security protection, with respect to your responsibilities as the Deputy Administrator for Defense Programs of NNSA?

Yes.

Congress has worked with NNSA to reduce and streamline reporting requirements. However, in 2016 and 2017, NNSA submitted almost none of its required reports to Congress on time. More often than not, reports are many months or over a year late, and NNSA has generally become less responsive to this Committee over the last several years.

Do you commit, if confirmed, to improving this record?

Yes.

Do you agree to ensure that testimony, briefings, and other communications of information are provided to this Committee and its staff and other appropriate committees in a timely manner?

Yes.

Do you agree to provide documents, including copies of electronic forms of communication, in a timely manner when requested by a duly constituted committee, or to consult with this Committee regarding the basis for any good faith delay or denial in providing such documents?

Yes.

Do you agree to answer letters and requests for information from individual Senators who are members of this Committee?

Yes.

If confirmed, do you agree to provide to this Committee relevant information within the jurisdictional oversight of the Committee when requested by the Committee, even in the absence of the formality of a letter from the Chairman?

Yes.