

Advance Policy Questions for Lisa Porter
Nominee for Deputy Under Secretary of Defense for Research and Engineering

Department of Defense Reforms

The National Defense Authorization Acts for Fiscal Years 2017 and 2018 included the most sweeping reforms since the Goldwater-Nichols Department of Defense Reorganization Act of 1986.

1. Do you support these reforms?

Yes

2. What other areas for defense reform do you believe might be appropriate for this Committee to address?

With the leadership of this committee, the Fiscal Years 2016 and 2017 (FY 16 and 17) National Defense Authorization Acts (NDAAs) enacted by Congress present a unique opportunity to make major, meaningful reforms to the Department of Defense (DoD). If confirmed, I look forward to working with Congress to implement properly the reforms already on the table, and to identify potential changes in other areas.

Duties and Qualifications

3. What is your understanding of the duties and functions of the Deputy Under Secretary of Defense for Research and Engineering?

The Deputy Under Secretary of Defense for Research and Engineering (DUSD(R&E)) reports to the Under Secretary of Defense for R&E as his principal staff advisor, and serves as the deputy chief technology officer for the Department. In this capacity, the DUSDR&E will support the USDR&E in providing R&E leadership on behalf of the USD, establishing the overarching strategic direction of the Department's investments in R&E, and developing and implementing policies and best practices for research and development, prototyping and experimentation, and rapid fielding of advanced capabilities.

4. What background and experience do you possess that qualify you to perform these duties?

I have held technical and leadership roles in both the government and the private sector for over 20 years. In my current position at In-Q-Tel as the director of IQT Labs, I set the strategic direction and oversee the execution of projects that explore the art of the possible in a variety of research areas that have significant national security impact. Prior to that, as President of Teledyne Scientific & Imaging, I was responsible for a business that provided a variety of technologically advanced products to both government and commercial customers.

Prior to my time at Teledyne, I spent over 10 years in the government in a variety of technical leadership roles. I started as a program manager at the Defense Advanced Research Projects Agency (DARPA), and later became the Associate Administrator for Aeronautics at the National Aeronautics and Space Administration (NASA), and finally, the first Director of the Intelligence Advanced Research Projects Activity (IARPA), where I was responsible for standing up a new organization in the Office of the Director of National Intelligence (ODNI) modeled after DARPA.

I earned a B.S. in Nuclear Engineering from MIT and a Ph.D. in applied physics from Stanford, and I also served as a lecturer in the Nuclear Engineering department at MIT while conducting my post-doctoral research focused on computational materials modeling.

5. Do you believe that there are actions you need to take to enhance your ability to perform the duties of the Deputy Under Secretary of Defense for Research and Engineering?

I believe that I have the necessary background, skills, and ability to perform the duties of the DUSD(R&E).

6. If you are confirmed, what duties and functions do you expect that the Under Secretary of Defense for Research and Engineering will assign to you?

If confirmed, I expect the USD R&E to assign me duties and functions commensurate with those of the Deputy Chief Technology Officer, and any other duties the Under Secretary may deem appropriate.

Relationships

Please describe your understanding of the relationship of the Deputy Under Secretary of Defense for Research and Engineering with the following:

7. The Deputy Secretary of Defense

If confirmed, I would work closely with the Deputy Secretary to provide advice and assistance commensurate with the role of the Deputy Chief Technology Officer on a variety of topics, including the development of new systems through the operational prototyping phase, the demonstration of expedited approaches to the acquisition of new systems, effective technology transition to the field, the prioritization of science and technology investments, supporting a culture of institutional innovation, and leveraging technology to enhance current and future military capabilities. The Deputy Secretary of Defense, the Under Secretary for R&E, and I believe in the Department's mission to sustain American technological superiority, and I very much look forward to working with them on this effort.

8. The Chief Management Officer of the Department of Defense

If confirmed, I would work closely with the Chief Management Officer to ensure our programs are as cost-efficient as possible, so as to impose the least possible burden upon the American taxpayer.

9. The Assistant Secretaries of Defense for Acquisition and Sustainment

If confirmed, I would work closely with the Assistant Secretaries of Defense in the office of Acquisition and Sustainment to synchronize our research and engineering needs with the Department's acquisition and sustainment processes to ensure that we are best-positioned to accelerate the delivery of new warfighter capabilities.

10. The Deputy Under Secretary of Defense for Intelligence

If confirmed, I would work closely with the Deputy Under Secretary of Defense for Intelligence to ensure our research and engineering needs are synchronized across the Department. Timely intelligence and insight regarding emerging adversary capabilities are critical to informing and shaping our defense research and engineering programs.

11. The Deputy Under Secretary of Defense (Comptroller)

If confirmed, I would work closely with the Deputy Under Secretary of Defense (Comptroller/Chief Financial Officer) to ensure that investments in research and engineering meet the overall priorities of the Department and are managed in accordance with DoD policy.

12. The Deputy Under Secretary of Defense for Personnel and Readiness

If confirmed, I would work closely with the Deputy Under Secretary of Defense for Personnel and Readiness to ensure that our current research and engineering workforce is ready to support the needs of the Department, and to ensure that the technical talent necessary for the future readiness of our forces will be available to the Department.

13. The Service Secretaries

If confirmed, I would work to foster a close working relationship with the Military Departments to support their research and engineering priorities and

technology investments and to ensure that the overall Department research and engineering portfolio is aligned and balanced.

14. The Service Acquisition Executives

If confirmed, I would work closely with the Service Acquisition Executives to identify opportunities for streamlining the insertion of new technology into programs of record, to include the use of experimentation and prototyping to reduce technical and integration risk of new capabilities and systems before they enter the acquisition phase.

15. The Service Science and Technology Executives

The Service S&T Executives are responsible for developing and executing the science and technology programs for their respective Service. If confirmed, I would work to develop close working relationships with them to ensure that the overall DoD S&T investment is coordinated across the department and provides the best possible military capabilities and return on the taxpayer's investment.

16. The Directors of Department of Defense Laboratories and Research Centers

If confirmed, I would work closely, through the heads of the DoD components, with the Directors of Defense Laboratories and Research Centers to provide them with the guidance, resources, and support needed to deliver technology in support of DoD needs. I would also work to establish and maintain standards for laboratory and research center performance.

17. The Director of the Defense Advanced Research Projects Agency

If confirmed, I look forward to providing guidance, direction, and support to DARPA, an agency whose mission is critical to ensuring the continued technological dominance of the US military.

18. The Director of the Defense Threat Reduction Agency

If confirmed, I would work closely with the Director of the Defense Threat Reduction Agency to ensure we share our technologies and insights in order to counter possible enemy attacks of mass destruction (chemical, biological, radiological, nuclear and high yield explosives).

19. The Joint Staff

If confirmed, I would work closely with the Joint Staff to consider technology options and alternate mission capability approaches to enhance DoD systems and ensure our warfighters are affordably equipped with superior warfighting capabilities.

20. The Director of the Defense Test Resource Management Center

The Defense Test Resource Management Center (DTRMC) strives to enhance national test and evaluation infrastructure, support sustained investment in the Major Range and Test Facilities Base, and explore modelling and simulation techniques to enhance the effectiveness and efficiency of test and evaluation of DoD systems. If confirmed, I look forward to providing guidance and support to the DTRMC in executing its mission.

21. The Director of Operational Test and Evaluation

If confirmed, I would work with the Director of Operational Test and Evaluation, to include consideration of technology options and alternate approaches for enhancing the operational effectiveness, suitability, and survivability of DoD systems. I would also work to optimize test and evaluation activities to the greatest extent possible to quickly deliver reliable and effective systems to the warfighter. I believe operational testing has a critical role in identifying weapon system vulnerabilities that jeopardize warfighter efficacy, before the department makes a full-rate production decision.

22. The Department of Defense Chief Information Officer

If confirmed, I will work closely with the Chief Information Officer (CIO) on cross-cutting joint information assurance and information management issues and ensure the CIO is engaged on the development of architectures encompassing critical information capabilities.

23. The Director of the Defense Information Systems Agency

If confirmed, I would work closely with the Director of the Defense Information Systems Agency to support the provision, operation, and surety of the Department's globally accessible enterprise information infrastructure, command and control, and information-sharing capabilities.

24. The Director of the White House Office of Science and Technology Policy

If confirmed, I would work closely with the Director of the White House Office of Science and Technology Policy to support the development of national technology strategy with areas relevant to national security.

25. The Director of the Defense Innovation Unit Experimental

Working with the Director of the Defense Innovation Unit Experimental, I will ensure that we promote outreach to non-traditional vendors as a key component of retaining technological superiority and more rapidly providing capability to the warfighter.

26. The Director of the Strategic Capabilities Office

Working with the Director of the Strategic Capabilities Office, I will ensure that the DoD can effectively identify and develop novel uses for technologies that have already been demonstrated in military and/or commercial applications, in order to provide innovative near-term solutions to mission challenges.

27. The Director of the Air Force Rapid Capabilities Office

If confirmed, I would work closely with the Air Force Rapid Capabilities Office to consider technology options and alternate mission capability approaches to enhance DoD systems and ensure our Airmen are affordably equipped with superior warfighting capabilities.

28. The Director of the Army Rapid Capabilities Office

If confirmed, I would work closely with the Army Rapid Capabilities Office to consider technology options and alternate mission capability approaches to enhance DoD systems and ensure our Soldiers are affordably equipped with superior warfighting capabilities.

29. The Director of the Marine Corps Capabilities Office

If confirmed, I would work closely with the Marine Corps Rapid Capabilities Office to consider technology options and alternate mission capability approaches to enhance DoD systems and ensure our Marines are affordably equipped with superior warfighting capabilities.

30. The Program Administrator for Department of Defense Small Business Innovation Research

If confirmed, I would work closely with the program administrator for Department of Defense Small Business Innovation Research to continue to maximize opportunities for small businesses to contribute to national security. The small business community is an essential contributor to innovation and cutting-edge technologies, and I would work to improve the Department's ability to leverage the capabilities this community has to offer.

Relations with Congress

31. If confirmed, what actions would you take to create a productive relationship between Congress and the Deputy Under Secretary of Defense for Research and Engineering?

If confirmed, I will ensure that there is regular, frequent, open, and honest communication with Congress from within the organization. To the maximum possible extent, I will make myself available to the Congress for this purpose.

Reorganization and Reform of the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics

32. What staffing and resources do you believe that the Deputy Under Secretary of Defense for Research and Engineering will require? Are you satisfied that the Deputy Under Secretary of Defense for Research and Engineering will be properly staffed and resourced?

While I am optimistic that the office of the Deputy Under Secretary of Defense for Research and Engineering will be properly staffed and resourced, I do not yet know the in-depth details of the status of personnel and resources for the office. If confirmed, I will make this analysis a priority.

33. Which functions of the former Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics do you believe should be shared between the Office of the Under Secretary of Defense for Research and Engineering and the Office of the Under Secretary of Defense for Acquisition and Sustainment?

Most of the difficult decisions associated with the reorganization of USD(AT&L) into the new USD(R&E) and USD(A&S) involve determining the proper placement of existing personnel and organizations. In some cases, those existing organizations will need to be changed, or new offices created, to support the missions of these two new USDs. A working draft of the department's reorganization plan was provided to

Congress in August; I do not have anything to add to that report at this point. If confirmed however, I will work closely with the current USD(R&E) and USD(A&S) to make logical choices as to how we continue to restructure these two new USDs.

34. If confirmed, how will you ensure effective collaboration between your office, the Office of the Under Secretary of Defense for Acquisition and Sustainment, and the military services?

If confirmed, I will communicate frequently with both the USD(A&S) and the Services to ensure that we are providing our nation's warfighters with the best equipment and technology to defeat our adversaries. Furthermore, the structure we establish for the USD(R&E) and the USD(A&S) must promote and facilitate cooperation across the USDs, while working with the Services to rapidly and effectively deliver new technologies and new capabilities to the warfighter.

35. What actions will you take to ensure that the Office of the Under Secretary of Defense for Research and Engineering is established for success beyond your tenure as Deputy Under Secretary?

If confirmed, I will establish a clear mission as the Deputy Under Secretary for Research and Engineering in the Department of Defense. This mission must include determining the key technical areas upon which the department must focus, both in the near- and long-term, from setting the technical direction for the Department to helping establish a culture of execution that embraces the use of disciplined experimentation and prototyping to quickly drive down technological risk, so that systems can be more rapidly delivered to the field and confidently employed by the warfighters. To accomplish this mission, if confirmed, I will assist the USD (R&E) to staff the new organization to ensure that we have a deep bench of talent to support the enduring advancement of U.S. technological superiority.

36. How will you guide the Defense Department's overall approach to technology with the authorities and tools available to you?

If confirmed, I will carry out the direction of Dr. Griffin's mission for the Department of Defense and will help to shape our technology investments to meet future threats. Critical to this mission is the need to understand and embrace taking measured risks in order to develop the next generations of capabilities the department needs. This includes significantly leveraging prototype developments and experimental efforts, pushing innovative approaches to developing capability and, above all, working closely with the warfighters to understand their real needs and to deploy new capability as rapidly as possible to the field.

37. Based on your previous government and corporate executive experience, what additional authorities do you feel that you or the Under Secretary of Defense for Research and Engineering require to most effectively perform your designated duties?

In my current capacity I do not have the necessary insight into the office of the Under Secretary of Defense for Research and Engineering to know. However, if confirmed, I will work closely with Dr. Griffin to review our authorities to determine if additional or modified authorities would be necessary to most effectively perform our designated duties.

38. Many of the reforms passed in the National Defense Authorization Acts for Fiscal Years 2016 and 2017 are yet to be implemented and in many cases are overdue. What actions will you take to implement the reforms for which you are responsible?

If confirmed, one of my first actions as DUSD(R&E) would be to thoroughly review the status of not only the USD(AT&L) reorganization effort, but also the implementation of reforms enacted in the FY16 and FY17 NDAA's within my purview. For those reforms yet to be implemented, I would work closely with the Department and Congress to bring the implementation process to a conclusion. As with any congressional reform or request, I would communicate frequently with Congress to ensure proper implementation pursuant to congressional intent.

Major Challenges and Priorities

39. Outside of the reorganization, in your view, what are the major challenges that will confront the next Deputy Under Secretary of Defense for Research and Engineering? If confirmed, what plans do you have for addressing these challenges?

I believe the critical task for the DUSD(R&E) will be to ensure that our warfighters are provided with technological capabilities that far surpass those of our adversaries, now and in the future. The Department's Research and Engineering enterprise (comprised of the Service/Agency laboratories and engineering centers, academia, other government agencies, industry, and allies) must continue to provide the U.S. with the technological superiority that underpins U.S. conventional deterrence.

One of the challenges we face is the global nature of technological development. We can no longer take our nation's technological dominance for granted; we must work hard to preserve and sustain it. This will require establishing a culture and incentives

that unleash the full potential of the talent resident throughout our enterprise. We must break down the barriers that prevent innovative ideas from surfacing, and that deter participation of “non-traditional” entities in solving our pressing challenges. We also must create an environment of inclusion across the technical communities; no one group has a monopoly on innovation.

A second challenge is the need to improve the speed of technology transition to operational use. I fully support Dr. Griffin’s public emphasis on experimentation and prototyping as a means of effectively reducing technological risk to enable more rapid deployment of advanced capabilities to the field. If confirmed, I will work with him to establish the culture, incentives, and best practices to make experimentation and prototyping a key component of technology development, to ensure we don’t leave our most innovative ideas “on the shelf”.

40. If confirmed, what broad priorities would you establish in terms of issues that must be addressed by the Deputy Under Secretary of Defense for Research and Engineering?

If confirmed, my first priority as the new DUSD(R&E) would be to support Dr. Griffin in his efforts to establish a new organizational structure that will support the USD(R&E) mission. Once the structure is established, each part of the organization must be properly staffed to accomplish their respective missions. I will work alongside Dr. Griffin to align efforts across the Department and leverage developmental efforts in the private sector wherever practical to ensure that we maintain U.S. military technological advantage over adversaries.

If confirmed, I will champion the use of prototypes and experiments to drive down technical/integration risk and refine requirements before committing to Programs of Record, and pilot new acquisition methods to expedite capability to the warfighter. All of these priorities, and associated efforts of the office of USD(R&E), will support the Secretary’s priorities of lethality, collaboration with allies and partners, and organizational reform with the goal of greater efficiency and effectiveness.

41. What defense technologies do you consider the highest priorities for development to enhance the Department of Defense’s ability to pursue its designated missions? Where do you believe the Department is currently taking the most risk?

I believe that an effective research and engineering program must focus on a balance between addressing near- and long-term capability gaps, and a balance between pursuing technology that provides incremental capability improvement and technology with the potential for more revolutionary impact. There are many

opportunities to leverage technology to provide capability advantages for U.S. forces. Today, near-term opportunities exist in many areas, including: data analytics, communications, electronic warfare, propulsion, hypersonics, cyber-defense, undersea technologies, advanced manufacturing, and space technologies that can shape new systems concepts and operational architectures. Over the longer term, emerging ideas in areas such as quantum science, material science, biotechnology, and new computational architectures will feed future capability opportunity. I do not yet know where the Department is taking the most risk but, if confirmed, I will assess where risk is being taken, whether the level of risk is appropriate, and how it is being tracked and mitigated as part of technology maturation.

42. Which of these technology areas will your office focus on and which technologies do you believe are best managed by other offices and agencies outside of your purview?

If confirmed, I will carefully analyze the status of our emerging technologies in order to determine how to optimize the new USD(R&E) structure to more capably and efficiently develop each technology, with the ultimate goal of attaining much more rapid and cost-effective delivery to the warfighter.

43. What will be your strategy for developing these technologies in a manner to support needed defense capabilities in a timely and cost effective way?

If confirmed, I would look at all available development strategies and evaluate them against the constraints of being timely and cost-effective. I believe that the future competitive national security environment will drive the Department to place increasing value on the pace at which we move technologically enabled capabilities from concept to operational use. To accelerate our pursuit and exploration of innovative concepts, the Department must make best use of its own in-house capabilities, those of academia, and those of industry – large and small. We must also be open to engaging with new innovative non-traditional commercial entities and make better use of the global capabilities of our partners and allies.

44. How will you connect your technology strategies and plans with the efforts of others across the Department of Defense?

It is critical for the newly confirmed office of the USD(R&E) to ensure that the research and development efforts executed by the Services are aligned with the Department's priorities and Joint warfighter needs. If confirmed, I would coordinate with the R&E enterprise to establish clear technology roadmaps for the development of capabilities and will work closely with the DoD Services/Agencies to ensure that unintended duplication is minimized and resources are efficiently utilized. If confirmed as the DUSD(R&E), I would also support Dr. Griffin in

leading efforts of the development of architectures and standards that will enable the development of Service systems and capabilities that can operate effectively in a Joint environment.

45. What scientific fields do you consider the most important in shaping and developing the new technologies, concepts, and capabilities that will be most relevant for future warfighting and defense missions?

I consider a wide range of technical fields critical in shaping and developing defense capabilities, ranging from foundational areas such as materials and computer science to specialty fields like hypersonics and cybersecurity. If confirmed, I will take an approach that not only develops the most important scientific and engineering fields related to those capabilities, but also employs rapid transition mechanisms to enable the U.S. and DoD to maintain its technological edge. If confirmed, I will leverage public and private investment in research and development, work with industry and academia to ensure the appropriate policies and incentives enable our innovators and industries to thrive here in the U.S., and collaborate with our international partners when appropriate.

Support for the Chief Technology Officer

If confirmed, you will be the Principal Deputy to the Chief Technology Officer (CTO) of the Department of Defense.

46. What do you see as the role of the CTO of the Department of Defense?

The CTO of the Department of Defense will be the primary advisor to the Secretary and the Deputy Secretary of Defense for all things related to scientific and technological exploration, development, maturation, and transition within the DoD. The CTO sets the technical direction of the entire Department, providing guidance that helps to shape the DoD S&T investments and facilitating the development of technology options that result in joint capabilities for the Department. The CTO should also ensure that major acquisition programs are conducted with acceptable technical risk consistent with the Department's need for a faster pace in our efforts.

47. What experience do you have that will enhance your ability to serve as the Principal Deputy CTO of the Department?

I believe that my experience leading high-performing technical organizations in both the government and private sector that have developed and delivered technologies

that span a wide variety of disciplines and capabilities provides me with the appropriate experience to serve as the Deputy CTO of the Department.

Furthermore, I have published original research in a wide variety of domains spanning nuclear engineering, plasma physics, computational materials science, control of flexible structures, landmine detection, and ballistic missile defense. While at DARPA, I developed and managed programs focused on reducing drag on naval vessels, quieting helicopters, accessing remote areas, and developing low bit-rate speech encoding technologies for noisy environments. While at NASA, I was responsible for all elements of NASA's aeronautics portfolio, to include research in hypersonics, which we conducted in close collaboration with the Air Force. As the first director of IARPA, I established an organization that adopted the fundamental philosophy and strategy of DARPA, and started programs covering a broad range of areas including biometrics, advanced analytics, technology forecasting, cyber offense and defense, and quantum computing. I believe the breadth of my technical experience will serve me well in this position, if confirmed.

48. Given the growing role of information technology and software in military capabilities, what do you understand to be the differences in roles, responsibilities, and authorities between the Office of the Chief Information Officer and the CTO?

As the Department continues to stand up the new USD(R&E), the roles, responsibilities, and authorities of the CTO will be defined and refined. I believe there should be a strong connection between the research and development of information technology and cybersecurity capabilities (a CTO mission) and the development and implementation of policy related to these technologies (a CIO mission). If confirmed, I will work to ensure a close collaboration exists with the OCIO.

49. What is the status of the Department's long-range research and development planning activities? What noteworthy results have been realized from that initiative so far?

If confirmed, I look forward to being briefed upon and becoming more familiar with that initiative. It is my understanding that the Long-Range Research and Development Planning Program (LRRDPP) was an initiative undertaken in the 2015-2016 timeframe focused on identifying emerging technology and materiel opportunities that could strengthen DoD capabilities in a competitive future national security environment. I have been told that the LRRDPP study engaged technical experts across the Department's research and engineering enterprise, as well as academic, not-for-profit, and defense and non-defense commercial

organizations, to identify emerging opportunities for future military innovation. I have also been told that this study has been used to help refine the investment strategy of the Services going forward.

50. What role should the CTO play in the development and oversight over technologically complex acquisition programs of the military services and defense agencies?

The CTO must advise the Secretary on the technical risk associated with Programs of Record as well as the appropriate investment strategy to achieve technology superiority.

51. Do you believe that the Deputy CTO should have a role in “portfolio management” of science and technology investments within the Department? If so, how will you exercise that authority, if confirmed?

Yes, I think that the Deputy CTO should have a role in portfolio management of S&T investments within the Department. If confirmed, I will work with the USDR&E to ensure that our S&T investments are well aligned with the National Defense Strategy. Given the continually growing list of critical S&T areas, there is value in leading initiatives that ensure collaborative and mission-focused S&T is occurring, and if confirmed, I will pursue opportunities to enhance that collaboration.

52. Do you see the role of the Deputy CTO as an assistant to the CTO or a force multiplier who can take on tasks and divide a rapidly evolving portfolio?

If confirmed, I am prepared to take on both roles. I look forward, if confirmed, to prioritizing a rapidly growing and evolving portfolio within the research and engineering enterprise, in order to address the enormity of the challenges the enterprise faces in delivering world-class capabilities to the warfighter at the speed of relevance.

Investment in Science and Technology

53. If confirmed, how will you establish the direction and oversee the execution of the Department of Defense’s investments made under the defense science and technology (S&T) program?

I have been told that the Department maintains an S&T Executive Committee (ExCom) consisting of representatives from within OSD, the Services, and Defense Agencies. It is my understanding that through the ExCom, the S&T leadership shapes and oversees the S&T enterprise, and if confirmed, I look

forward to leveraging this Committee's activities to support the USD(R&E)'s efforts to set the technical direction and oversee the execution of the DoD's S&T program in line with the priorities outlined in the National Defense Strategy.

54. What metrics will you use to assess the size and portfolio of S&T investments?

I do not yet know what metrics I will use to assess these investments. If confirmed, I will examine the methods currently in use and make an evaluation as to their suitability going forward.

55. What role should the Deputy Under Secretary of Defense for Research and Engineering play in the detailed development and coordination of service and agency S&T investment strategies, programs, and budgets?

If confirmed, it will be an early priority of mine to understand the approach presently in use for development and coordination of service and agency S&T strategies, programs, and budgets. I look forward to working with my colleagues and with this committee to formulate plans going forward.

56. What S&T areas do you consider underfunded by the Department?

I do not yet have sufficient knowledge to know whether there are S&T areas that are underfunded. If confirmed, I look forward to gaining better insight into the existing programs and budgets within the DoD S&T enterprise to determine whether funding adjustments may be warranted.

57. Which, if any, S&T areas could benefit from further coordination between the military services?

The role of the Office of the Secretary of Defense is to fill the gaps and seams between the Services to ensure inherently joint capabilities are addressed, especially when they are high risk and high priority. I have been told that many of the critical S&T areas already benefit from coordination among the military services through the Communities of Interest (CoIs) and joint projects, and if confirmed, I look forward to leveraging these efforts, and others, to ensure the military services have coordinated and collaborative S&T portfolios in areas of mutual interest and joint applicability, and I will promote efforts to close gaps as appropriate.

58. In your judgment, will the funding levels in these areas affect the Department's ability to meet the threats of the future?

If confirmed as the DUSD(R&E), I look forward to gaining better insight into the future of the Department's S&T budget, and I will make it a priority support the USD (R&E) in any effort to communicate budgetary needs clearly to the Deputy Secretary and Secretary of Defense.

59. Do you believe that the Department's current S&T investment strategy strikes the appropriate balance between funding innovative, disruptive technologies and addressing near-term operational needs and military requirements?

From what I have seen, yes, I believe the current DoD S&T investment strategy strikes an appropriate balance between funding innovative, disruptive technologies and addressing near-term operational needs and military requirements. If confirmed, I look forward to gaining better insight into this important topic.

Basic Research

60. Given the continuing nature of basic research and the broad implications and applications of discovery-focused and innovation-focused sciences, what criteria would you use, if confirmed, to measure the success of these programs and investments?

DoD's investment in basic research has played, and continues to play, a central role in creating and preserving our military technological advantage. Today's fielded technologies are rooted in, and dependent upon, the basic research discoveries of past decades.

If confirmed, I would continuously assess our investments in basic research in terms of the people and organizations we fund, the quality of their research, the transition of their efforts into applied research, and the influence they have in driving the development of technology options to meet warfighter needs.

61. What concerns do you have, if any, about current levels of funding for Department of Defense basic research? If confirmed, how would you plan to address those concerns?

Our historic national investment in basic research was one of the key factors in our advancement to world superpower stature. Other nations, especially China, fully understand this, and are making their own large investments in basic research. If confirmed, this is an area I will watch closely, with the goal of maintaining our technological superiority both now and in the future.

62. If confirmed, how would you determine whether there is an adequate investment in basic research to develop the capabilities the Department will need in 2025?

If confirmed, I would review recent studies of the Department's basic research activities and budgets and engage the S&T Executives to understand their approach to building the foundation for future warfighter capabilities.

63. If confirmed, what steps, if any, will you take to increase efforts in unfettered exploration, which has historically been a critical enabler of the most important breakthroughs in military capabilities?

If confirmed, I would emphasize to the DoD S&T Executives that basic research is a critical component of our future military capability, and that the Department, from its senior officials to its bench scientists, should engage with the nation's and the world's leading scientists and engineers. If confirmed, I would also support the Department's policy of minimizing restrictions on Department scientists in their pursuit of technical excellence, allowing them the ability to perform and interact with external researchers in their fields of expertise.

64. How should the Department balance the inherent openness and academic freedom that are integral to university-based fundamental research with the need to protect our national security interests and maintain technological advantages over our potential adversaries?

True advances in fundamental research require broad and open engagement with the scientific community. Such engagement ensures that the scientific method is soundly applied in order to separate brilliant ideas from those that are flawed. This philosophy has led to the development of many of the revolutionary advances that we enjoy today, including the internet, GPS-enabled maps, smart sensors, and cognitive assistants like Siri. Prematurely closing off the open and transparent engagement necessary for fundamental research will inhibit the quality and impact that this research will ultimately have. However, given the increasingly global nature of technology development, there is a risk of adversaries adopting what we learn and publish for their own use. In technology areas critical to our national defense, we can assess the maturity level of the technology development and make a determination as to if/when certain technologies and/or their applications need to be classified or otherwise protected. Furthermore, we must ensure that we move faster than our adversaries do to translate fundamental research results to applications that have mission impact. This requires support of research across the spectrum, from fundamental research to applied research and engineering to experimentation and prototyping.

Coordination of Defense S&T Internally and with Other Agencies

- 65. If confirmed, how do you intend to integrate the S&T programs of the military services and defense agencies to reduce redundancy, leverage investments, and promote cooperation in order to achieve greater efficiency and technological advancement?**

If confirmed, I would expect to engage in efforts to integrate and coordinate Military Department and Defense Agency S&T programs. I will work to ensure that S&T efforts across the DoD components are coordinated so as to improve efficiency and effectiveness, enhance collaboration, and reduce unnecessary duplication of effort.

Do you believe the mechanisms of coordination between federal civilian agencies and the Department of Defense are adequate to ensure that the military can best leverage the advances of agencies such as the following:

- 66. National Science Foundation on defense needs for basic science, especially in social sciences**

DoD funds basic research in targeted areas deemed most critical for defense, but also relies heavily on complementary basic research funded by U.S. Government agencies such as the National Science Foundation (NSF). I believe that coordination between the DoD and NSF is critical to our overall success.

- 67. National Institute for Standards and Technology for quantum computing and cybersecurity**

The scientific and technical results that emerge from National Institute for Standards and Technology within the field of quantum computing (and more generally in the quantum sciences) continue to be among the world-leading results, as demonstrated by the award of Nobel prizes to NIST government scientists in the quantum sciences in recent years. NIST also contributes substantially to the domain of cybersecurity. If confirmed, I will continue to encourage the research and engineering community within the Department of Defense to take advantage of many different coordination mechanisms, both formal and informal, for collaboration and communication with scientists and engineers from NIST.

- 68. National Aeronautics and Space Administration on hypersonics and other space research and the viability and availability of testing facilities**

I believe the current level of coordination between DoD and NASA is healthy; however, I am not personally familiar with the more recent details, and if confirmed I will need to assess areas for enhanced collaboration between the two organizations, such as hypersonics, and the viability of test facilities.

69. National Institutes of Health on areas in which military medical research and vaccine development overlap with civilian medical needs

I am told that the degree of collaboration between NIH and DoD in these areas is extensive. However, I am not personally familiar with the details, and if confirmed will need to assess whether our present efforts are adequate and effective. The foci of the investments of NIH and DoD differ, but in areas where military and civilian research needs overlap, we need to ensure that our programs are complementary and mutually supportive.

70. Intelligence Community in setting defense research priorities to prepare for future threat environments

I believe the DoD must work closely with the Intelligence Community (IC) to inform defense research prioritization and planning. The August 2017 congressional report sent to Congress regarding the reorganization of USD(AT&L) into the USD(R&E) and USD(A&S) included the establishment of an analysis cell within the USD(R&E) in collaboration with both IC and DoD analysts. If confirmed, I would continue to pursue an open and transparent dialogue between the Department and the Intelligence Community with a shared goal of understanding the threats as well as technology projections for the future. Furthermore, IARPA and DARPA have developed a collaborative relationship that enables the sharing of research results and the elimination of unnecessary duplication in numerous technology areas; if confirmed, I will continue to support and encourage this relationship.

71. Department of Homeland Security on homeland defense and national security-related science

I believe that a strong partnership with the Department of Homeland Security is essential to ensure national security. If confirmed, I will continue to coordinate our DoD efforts with the Department of Homeland Security, strategically leveraging the technology investments being made by the two Departments.

72. If confirmed, how would you work with other federal agencies and the Office of Science and Technology Policy to improve coordination?

If confirmed, I would engage leadership within the other federal agencies and Office of Science and Technology Policy (OSTP) to establish a better

understanding of how to mutually support each other's missions. In these times of increasing threats and reduced budgets, it is incumbent upon leadership to ensure that we maximize the taxpayer's investment across all of our government agencies.

Technology Strategy

73. What weaknesses, if any, do you see in the current defense S&T strategic planning process, both within the Office of the Secretary of Defense and in the military departments?

If confirmed, I will continue to make it a priority to assess our current S&T strategic planning process. I look forward to working with the Services/Agencies to establish an overarching strategic plan that can be used to help inform recommendations to support the Department's annual budget submission to the President.

74. What do you believe are the key attributes for a good technology strategic plan that can be effectively used for programming and budgeting purposes?

I believe that an effective technology strategic plan should include: (1) specific, measurable, and actionable recommendations for science and technology; (2) a clear transition from research to experimentation and prototyping that has direct relevance to the Department's overall mission; and (3) quantifiable and measurable metrics to inform progress.

75. If confirmed, how would you work to ensure that strategic plans are utilized during the budget planning and programming process

If confirmed, I intend to support Dr. Griffin's efforts to put forth S&T strategic guidance to the enterprise focusing not only upon specific technology developments, but also upon the infrastructure and people within the Department. Additionally, I plan to restructure processes where they can be enhanced and streamlined to make the Department more efficient and effective.

76. How should a Department of Defense-wide technology strategy inform the activities of the military services and defense agencies?

If confirmed, I will work closely with Dr. Griffin to ensure that the technology strategy we develop is closely aligned with the National Defense Strategy; this technology strategy will then provide the overarching guidance for the research and technology development activities of the military services and defense agencies. I believe that the USD(R&E) should set the strategic technical direction for the

Department to ensure that the United States military retains its technological superiority and dominance. I plan to work with Dr. Griffin to ensure this is achieved across the Department.

GAO Recommendations to Support Innovation Initiatives

A recent GAO report (GAO-17-309) made several recommendations for the Office of the Under Secretary of Defense for Research and Engineering to manage the Department of Defense’s prototyping and innovation investments, including developing a strategy to communicate strategic goals and priorities and delineating the roles and responsibilities among the Department’s prototyping and innovation initiatives.

77. If confirmed, what steps will you take to implement these recommendations?

I believe that prototyping can be a very effective means to reduce technical and integration risk, and that a strategic approach to implementing prototyping activities is appropriate. If confirmed, I would assess the Department’s prototyping and innovation investments to ensure they align with the objectives of the National Defense Strategy and critical needs of the Joint Force. Working with Dr. Griffin, I would focus on using prototyping and experimentation to enable the Department to maintain its technological advantage over near-peer adversaries while accelerating the delivery of capabilities to warfighters.

Technology Transition

The Department of Defense’s efforts to quickly transition technologies to the war fighter have yielded important results in the last few years. Challenges remain, however, in successfully transitioning new technologies into existing programs of record, fielded systems, and major weapons systems and platforms.

78. How would you assess the effectiveness of current transition processes and systems?

The current system, while improving, has a long way to go to be effective to mitigate the infamous “valley of death,” that has been a challenge for decades. If confirmed, I will work to drive efficient and effective processes and practices regarding transition of technology into operational capability.

79. What challenges exist in technology transition within the Department?

One of the challenges of technology transition is a lack of effective and honest accounting of technical and integration risk, a shortcoming that is amplified when end users are not engaged early in the technology development. Bridging the

“valley of death” requires sufficient investment in prototyping to reduce that risk using sound engineering methods and end user engagement to guide the experimental testing of new technologies and systems under appropriate conditions. Technology developers must be incentivized to consider operational constraints upfront (e.g., environmental constraints that might require hardening or shock-proofing electronics, weight or volume constraints for useful implementation by soldiers in the field, etc.), and end users should be involved throughout the development cycle. Ongoing engagement between operational users and developers assists in producing a viable capability, and, as the capability matures, facilitates development of concepts of operations for operational use.

80. What would you do, if confirmed, to address these challenges?

If confirmed, I would emphasize the need for modular open system architectures, and I would champion initiatives that use prototyping and experimentation to demonstrate operational utility before committing to a Program of Record. I would also encourage the inclusion of technology insertion and technology refresh in all acquisition program planning. I believe these actions would help increase the Department’s ability to transition research and development more quickly and effectively into operational use.

81. What is the role of the Deputy Under Secretary of Defense for Research and Engineering in facilitating communication between technical communities, acquisition personnel, and end users to speed technology transition?

I believe an effective DUSD(R&E) must support efforts that incentivize a close working relationship among the requirements community, the acquisition community, the research and development community, and the operational communities to provide new capabilities that sustain our technological superiority against potential future adversaries. The DUSD(R&E) must coordinate across this broad set of communities: coupling technical opportunity to emerging requirements, informing technology development with operational feedback, and aiding transition of capabilities from research and development to acquisition. If confirmed, I would leverage existing forums to ensure an open dialog and sustain and strengthen ties among these diverse communities with the goal of speeding technology transition from concept to field deployment.

82. Do you believe that we need to change the manner in which we fund technology transition in the Department? If so, what changes would you recommend?

I must obtain further insight into the current practices to be able to answer this question satisfactorily. If I am confirmed, I will assess our present investments and processes that are intended to facilitate effective transition. Technology

development is often challenged by the unavailability of non-program-specific funding used to mature technologically driven capabilities, to prototype and experiment with emerging system concepts, and to support bridging technology development to support the transition of technology to operational systems.

Using Commercial Technology for National Security Missions

The Department of Defense's S&T and research and development (R&D) organizations have traditionally focused on developing new technologies internally, then transitioning those technologies into military capability and commercial technology. This model continues to be relevant, but the Department needs to develop new ways to leverage commercial technology with military relevance.

83. If confirmed, what changes would you pursue to current research and engineering, experimentation, and prototyping processes to make better use of commercial technologies?

I believe that the use of certain commercial technologies presents opportunities for the Department to leverage the innovation, rapid design iteration, and advanced production capabilities found outside of military applications. However, in an increasingly global and interconnected marketplace, these technologies also carry risks. If confirmed, I would seek ways to make emerging technologies more secure, through red-teaming to discover the vulnerabilities of new technologies that we can mitigate in our systems or exploit in adversary systems; and, through implementation of a trusted systems strategy, to better protect existing systems from a wide range of modern threats.

84. How would you effectively transition the outputs of such processes to major defense acquisition programs or capabilities that are fielded at scale with the military services?

Technology transition, including transition of commercial technologies, is most successful when the end transition partner or program office is involved early in the process of identifying and maturing or adapting the technology. I believe the acquisition and S&T communities must be strongly engaged and work closely throughout the technology development and transition process to maximize the impact that commercial technology solutions can provide. If confirmed, I will emphasize the need for close integration between the acquisition and S&T communities.

85. Many of the services have created their own organizations to make use of commercially available technologies. If confirmed, how would you ensure these offices coordinate and do not create unnecessary overlaps in investment?

I believe there is an inherent strength to multiple organizations leaning forward to find existing commercial technologies that can help meet the needs and requirements of their individual programs. If I am confirmed, I will support existing S&T collaboration efforts, enable new forums for collaboration beyond S&T, work to de-conflict investments, and leverage commercial technology sources across the Department's research and engineering activities.

There are a number of technology areas for which there is not yet consensus among defense experts on whether or not commercial markets exist or are appropriate for transfer for potential use in the commercial sector.

86. Which technology areas do you believe should remain inherently governmental?

Currently, I lack sufficient knowledge to fully answer this question. If confirmed, I expect to assess our technology gaps against the commercial market's ability to provide relevant technologies, compare those with our in-house capabilities, and leverage each as appropriate to achieve our objectives.

87. How should the Department of Defense ensure that they remain so?

I believe that by working closely with senior leadership within the Services/Agencies, we can identify and pursue those investment areas of greatest importance to the future that are not currently served by the market, and that will likely not be served by the market in the near future, while minimizing investments in those areas where the commercial market will meet the Department's requirements.

Specifically, what are your views on the appropriate roles for commercial entities, and methods for defense collaboration, in the areas of:

88. Offensive and defensive cyber security software

I will encourage collaboration with commercial industry to create new innovative cyber capability of benefit to DoD and others. While much DoD cyber infrastructure will necessarily utilize commercial products, critical components demanding high levels of trust and assurance will remain an inherently governmental responsibility. Offensive cyber capability development will largely be a government responsibility, but may benefit from commercial activities in areas such as cyber vulnerability assessment and reverse engineering tools.

89. “Big Data” to include collection, processing, migration, analytics, and visualization

I believe the Department should leverage the large commercial investments and innovations in processing, migration, analytics and visualization. The DoD should continue to exercise its inherent and unique strengths in data collection.

90. Cloud computing software and services

I am aware that the DoD is moving to the large-scale adoption of commercial cloud services augmented with DoD specific capabilities for some particular applications, and securing its data and processes whether in public or private clouds. While I do not have any specific data, if confirmed, I will support Dr. Griffin’s role in any discussions or initiatives that require USD (R&E) input or guidance.

91. Artificial intelligence

I believe the Department should leverage the considerable commercial investments propelling machine learning and data analytics advancements. However, this is an area where trust is necessary and challenging to attain, and where classified applications will often rely on classified training data. Accordingly, there will need to be inherently governmental development supplementing commercial capabilities.

92. Microprocessors

I believe that the DoD should continue to leverage commercial microprocessors and therefore continue to encourage commercial entities to provide stronger security and protections in its hardware. In those applications requiring trust or special features such as radiation hardening, microprocessors may be fabricated through trusted foundries and can include special cyber hardening innovations.

93. Quantum computing

Both the DoD and the IC have invested in quantum information science for many years, leading to noteworthy advances in this still nascent research domain. I support the continued investment in this area by the DoD.

94. Synthetic aperture radar

Given the unique SAR needs of the Department for wide area intelligence, surveillance and reconnaissance, I feel that the DoD should continue in a leadership role in

developing these capabilities. However, I believe the DoD should monitor commercial advances in SAR capabilities and leverage those advances when and if practical.

95. Micro satellites

I believe the Department should monitor the commercial investment in microsatellites, and leverage these satellites, when and if practical, to facilitate research and enable resilience in areas such as sensing, environmental forecasting, and communications.

96. Space launch

I believe the Department should continue to work with new and existing commercial entrants in advancing launch capabilities to enable launch flexibility and reductions in the cost of access to space.

97. Space-based capabilities generally

Commercial entities, both independently and in collaboration with DoD (and other government organizations), are continually advancing space-based capabilities in areas including: command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR); micro-satellites; propulsion; positioning, navigation and timing (PNT); and advanced analytics for processing large volumes of data. I believe that the DoD should continue to pursue collaboration with these commercial entities as appropriate in order to provide a cost-effective warfighting advantage.

98. Robotics

I believe that the DoD should heavily leverage commercial investments to simultaneously increase capability and affordability across a wide variety of department missions. In select missions requiring high levels of trust, some robotic development will remain inherently governmental, but will still be informed by demonstrated commercial capability.

99. Unmanned aerial systems

I believe that the DoD should continue to leverage the myriad of UAS capabilities being introduced through the commercial sector for military purposes. Significant innovation exists within the commercial UAS community, but the DoD will continue to be a contributor while protecting its national security-related interests.

Systems Engineering and Prototyping

100. Do you feel that the Department of Defense has sufficient systems engineering expertise in its current workforce or contractor base?

The need for systems engineering expertise to be resident in the DoD is growing; as technology evolves over time, the complexity of our systems is increasing. This has increased the Department's demand for professionals with effective systems engineering and technical skills. Based on several GAO reports citing program cost and schedule overruns attributed to a lack of adequately applied systems engineering processes, it is clear that the Department needs to do more. The DoD's workforce possesses strong technical capabilities, but it will be important for this workforce to be technically refreshed as new challenges arise and technical disciplines mature.

101. What will be the impact of further reductions in personnel to the ability to execute the systems engineering missions of the Under Secretary of Defense for Research and Engineering?

Further reductions in DoD's overall technical workforce would be detrimental to the Department's ability to develop, field, and sustain advanced technologies. This workforce enables the U.S. to innovate, create and maintain warfighting systems that maintain U.S. technological superiority. Additionally, this workforce allows DoD to efficiently and effectively design systems and architectures that quickly adapt to evolving missions and threats.

102. What changes, if any, do you believe should be made in the Department's systems engineering organization and practices?

If confirmed, I will assess the state of our systems engineering organization and practices and determine what, if any, changes should be made. I do believe that the Department's engineering centers must attract and retain organic engineering expertise, as well as the tools and methods to outpace our adversaries.

103. What is the value of competitive prototyping in increasing the success of the Department's acquisition efforts?

Competitive prototyping is most effective at increasing the likelihood of success of DoD acquisition efforts when it provides government customer representatives with insights into the offerors' technical concepts and drives real risk reduction in the actual product that the Department will acquire and field. Under the right conditions, competitive prototyping can be expected to have several benefits to DoD programs, including: reduction of overall technical risk; validation of cost; validation of design; evaluation of the manufacturing process; and refinement of program requirements.

The only potential problem with competitive prototyping is that it can impose significant front-end costs, since the Department must carry at least two offerors far enough through the design process to produce prototypes for evaluation. These costs are accepted in exchange for the promise of back-end savings and performance. The promise of long-term payoff in exchange for the certainty of short-term costs can be a difficult case to make, and so this cost penalty often reduces the apparent advantage of competitive prototyping. Thus, competitive prototyping is most effective in cases where the cost/benefit ratio is clearly advantageous, where multiple design options merit further exploration, or where the competitive environment drives early return on lifecycle cost.

104. If confirmed, how will you work to increase the amount of systems engineering projects and competitive prototyping efforts that are undertaken by the Department and its contractor base?

If confirmed, I will pursue the goal of prototyping projects under the authorities provided by Section 804 of the 2016 NDAA and Section 806 of the 2017 NDAA to increase the number of such projects and transition of those projects through rapid fielding. I will also leverage existing systems engineering projects at the Systems Engineering Research Center (SERC) with the Department's engineering and R&D centers.

105. What is your view on technical data rights and what rights the Department should retain from the prototyping phase into development?

Government rights to technical data are necessary to foster competition, field best-of-breed technologies and concepts, facilitate testing and evaluation, ensure availability of spare parts, enable capability evolution, support sustainment, and to allow the government to pursue alternate acquisition paths when a supplier fails to perform or goes out of business.

With regard to prototyping, I believe that Government sponsors must determine data needs based upon anticipated prototyping activities and outcomes, and consider these rights in the establishment of contracting and service level agreements. One of the biggest challenges is that specific data rights needs are often not known at the time of contract award, when there is the most leverage to negotiate the best price for, subsequent access to, and use of the IP. Accordingly, the DoD must move to a model that allows for negotiating options for access to IP during competition then exercising those options as needs are realized.

106. If confirmed, how do you plan to leverage prototyping to implement alternate pathways and accelerate the delivery of technologies?

If confirmed, I plan on focusing the Department's prototyping and experimentation efforts to bring advanced emerging technologies more quickly to our warfighters to address the growing capability of our adversaries and retain the U.S.'s technological superiority. This will require prioritized investments in future capabilities and using new contract flexibilities provided by Congress to utilize rapid acquisition pathways. In accordance with USD(R&E)'s strategic direction, I will work to develop specific, measurable, and actionable recommendations for the Department; identifying a clear transition between research, experimentation, and prototyping that directly supports the National Defense Strategy; and includes detailed metrics to inform progress. If confirmed, I will also conduct an inventory of current and past programs that use/have used prototyping successfully to leverage and share best practices across the DoD.

Venture Capital Strategies

In recent years, some components of the Department of Defense have attempted to follow the lead of the Intelligence Community by using venture capital firms to make investments in developing technologies. Given your experience at In-Q-Tel,

107. What role do you believe that venture capital firms should play in the Department's investments in developing technologies, including in the Small Business Innovation Research program?

Venture-backed start-ups offer a unique source of innovative solutions for national security (both the DoD and the IC) in a variety of areas ranging from data analytics to cybersecurity to biotechnology. From my time at IQT, I would offer that the best outcomes result when the government takes a "light touch" with these companies, and importantly, does not derail them from their commercially-focused business plans. Rather, a small investment designed to tailor or tweak an already-planned-for commercial product allows a start-up (and its venture investors) to stay focused on its commercial pursuits, while allowing the government to "ride the wave" and obtain tailored technology suitable for its mission. This means that the government must accept that not all of its problems are suitable for the venture-backed community to address; but for those where the overlap with commercial applications is significant (e.g., data analytics, cybersecurity), the potential opportunities are huge.

Of course, venture-backed start-up companies are not the only small businesses that have innovative solutions to offer the DoD, and the Department's Small Business Innovation Research program can be a very effective means of engaging all small businesses.

It is also worth noting that many successful start-ups originated from universities and university spin-outs whose funding came from DARPA programs, or from the various S&T offices in the Services. Thus, it is important to look at technology development holistically, and to understand how deeply the government can influence and affect it, as well as benefit from it, from early-stage research all the way through system integration.

108. What advantages and disadvantages do you see in the use of venture capital strategies?

It is important for the government to understand that venture firms are not looking to create DoD contractors. If the government wants to leverage venture-backed start-ups effectively, it must be willing to take a back seat to the commercial business plan of these companies; smart investments by the government focus on ways to design “hooks” into the commercial products to enable tailoring for government applications. Furthermore, the DoD must understand the cost-benefit analysis underpinning the venture community; the willingness to take on real financial risk for significant upside gain translates into the fact that the vast majority of start-ups fail. For the venture firm, this failure rate is acceptable because of the huge upside of the one potential “unicorn”. For the government, this failure rate for investment may or may not be acceptable, depending on the application/technology of interest, but it must be considered upfront as part of the investment strategy.

109. When the Department does decide to use venture capital strategies, what steps do you believe the Department should take to ensure that Department funds are invested in technologies and companies that properly reflect national defense priorities, avoid the potential for conflicts of interest by industry partners, and ensure that the Department’s investments are not diluted?

This is a key question. The Department must accept that not all of its problems lend themselves to solutions from the venture-backed start-up community; the best alignment is obviously where there is a commercial application that is similar to the military one (e.g., data analytics). But having application overlap is not sufficient; as with other investments, the Department must look at the quality of the organization that it chooses to invest in, and it must ask itself what mitigations it would want to put in place if the start-ups that it invests in ultimately fail.

110. What other strategies do you intend to employ, if confirmed, to ensure that the nation’s most innovative companies work on the Department’s research and engineering programs?

If confirmed, I would continue efforts to reach non-traditional vendors and seek ways to simplify their engagement with the Department. It is worth noting that no one

type of company, large or small, private or public, venture-backed or government-funded, has a monopoly on innovation. Indeed, some of the best successes I have seen, during my time at DARPA, NASA, IARPA, and In-Q-Tel, are when different companies and organizations come together to work on a problem, leveraging the strengths that each type of organization has to offer. I would assess how the Department is using existing statutory authorities, such as Other Transaction Authority, to ensure that all tools are being used effectively. Additionally, I would review our traditional contracting processes to ensure they are efficiently and effectively implemented and supportive of the most innovative companies working with DoD.

International Research Cooperation

111. In your view, how should increased globalization of defense technology affect the Department of Defense's research and technology development and investment strategy?

In my opinion, the increased globalization of defense technologies provides both opportunities and challenges for the Department. To the extent that the DoD can leverage technology developments in allied and friendly nations, the DoD will be able to redirect resources to address other critical needs. Furthermore, collaboration with allied and friendly nations on fundamental research will be hugely beneficial, ensuring that we maintain our technological and scientific prowess in a world where our peers are as capable as we are in many research domains. However, globalization of defense technology creates challenges to our technological superiority through the proliferation of advanced military capabilities, and we must be mindful of that as we mature technologies and tailor them for specific applications.

112. What is your assessment of the value of cooperative research and development programs with international partners?

Cooperative research and development programs with international partners enable us to interact with the best and brightest in many nations and deepen our defense relationships with our allies and other partner nations. Cooperative research and development programs with international partners also support Secretary Mattis' goal to expand and strengthen alliances and partnerships.

113. In your view, what are the obstacles to more effective international cooperation, and, if confirmed, how would you address those obstacles?

Successful international cooperative research and development programs require

trusted partnerships between and among the nations involved. Ultimately, such agreements will only bear fruit if each side perceives them to be transparent in their formulation, reciprocal in their obligations, and beneficial to each party. If confirmed, I would be attentive to ensuring our proposed international cooperative efforts address these commitments.

114. How will increased international technology cooperation affect our domestic defense industrial base?

International cooperative research and development programs can provide opportunities for the defense industrial base to work with and develop relationships in other nations. This can lead to increased business opportunities through the creation of trusted partnerships. It can also provide the Department with increased access to world-class research and researchers.

115. How should the Department monitor and assess the research capabilities of our global partners and competitors, and of the global commercial sector?

It is my understanding that the DoD maintains awareness of global S&T and commercial capabilities through our global technology watch efforts and through the Military Departments' regional and global international S&T offices. If confirmed, I would support and strengthen these critical tools for providing situational awareness of the competitive global S&T landscape. The Intelligence Community also expends effort to maintain cognizance of global capabilities, and if confirmed, I would work to ensure that the DoD and IC continue to share their insights on this topic.

Test and Evaluation

116. If confirmed, how do you plan to develop and implement best practices for rapid and effective testing of new and emerging technologies and systems?

The USD(R&E) is responsible for developing and fielding new technologies and prototype demonstrations for the Department. If confirmed, I will support Dr. Griffin to ensure that the Department is developing effective, efficient, and expedient test strategies, demonstrations, and utility assessments.

117. What modifications would you recommend to the test and evaluation processes in the Department of Defense to more efficiently and quickly develop and deliver operationally effective and suitable technologies and systems to the warfighter?

I do not yet have sufficient information to provide a comprehensive response. However, if confirmed, I will ensure the senior official responsible for Developmental Test and Evaluation works closely with the Director, Operational Test and Evaluation to reduce unnecessarily duplicative testing, and to conduct operationally realistic system level testing that accelerates transition of effective technologies and systems to the warfighter.

118. What are your views on the adequacy and effectiveness of the Department of Defense's developmental test and evaluation, and operational test and evaluation activities?

I do not yet have sufficient information to answer this question. If confirmed, I look forward to working with the committee to guaranteeing that our test activities are properly structured and implemented.

119. What changes do you anticipate are warranted in the Department's developmental testing organization and capabilities?

I do not yet have sufficient information to answer this question. If confirmed, I will will work with Dr. Griffin to implement an appropriate organizational structure to ensure that developmental test and evaluation is properly staffed and resourced and given the right authorities in the Department.

120. What role do you believe the Office of the Secretary of Defense should play in developmental test and what type of organizational structure and staffing is required?

I believe the Department needs to execute enough testing to ensure warfighters are equipped with affordable, effective, suitable, reliable, and survivable systems. Such testing must be commensurate with the urgency of deploying a capability. If confirmed, I will review and implement an appropriate organizational structure to ensure that developmental test and evaluation is properly staffed and resourced and given the right authorities in the Department.

Small Business Issues

The \$1 billion+ annual Department of Defense Small Business Innovation Research (SBIR) program has shown great success in investing in innovative technologies and small businesses and transitioning products to acquisition programs and into operational use.

121. If confirmed, how would you work to ensure that the SBIR program serves a useful purpose in meeting the Department's research goals?

If confirmed, I would work to ensure that the program remains focused on innovation and technology advancement aligned with the Department's overall research goals. I believe that the SBIR/Small Business Technology Transfer (STTR) program has the potential to be a valued contributor to meeting the Department's research goals and warfighter needs.

122. What recommendations would you suggest to the SBIR program to improve the transition of S&T capabilities into acquisition programs?

I do not yet have sufficient information to make an informed recommendation. However, if confirmed, I would work to simplify engagement with the Department so that small businesses are not so burdened by our existing processes. I will support the development of goals for our acquisition programs and incentives to industry to improve SBIR transition and would reinforce them with guidance, education, and training across the Department and the industrial base.

123. What recommendations would you suggest to the SBIR program to improve its ability to attract non-traditional defense contractors, such as small startup companies, into the program?

If confirmed, I would explore avenues to continue to improve the ability of the DoD to attract non-traditional defense contractors through a comprehensive outreach and communication strategy. Based on my experience with venture-backed start-ups at In-Q-Tel, I would encourage the SBIR program to employ a "light touch" with small businesses to ensure that they are able to prioritize their commercial objectives while engaging with the Department.

124. How would you work to ensure the Department effectively leverages small businesses, to include appropriate considerations of intellectual property?

If confirmed, I would encourage the Research and Engineering community to continue to utilize small businesses for new or enhanced capabilities and would ensure the Department complies with all intellectual property considerations while protecting both the Government's interests and the health of the industrial base. I will support existing initiatives to continue to improve SBIR transition with guidance, education, and training across the Department, to include specific guidance on SBIR data rights and intellectual property.

125. What guidance or direction do you consider necessary regarding the transition of research results of SBIR programs to major weapons systems and equipment?

I do not presently know. If confirmed, I will review the current processes and guidance and make necessary recommendations.

126. What emphasis would you place, if confirmed, on participation by the acquisition community in setting research priorities for the SBIR program and in accepting new solutions into existing programs of record?

I believe that the acquisition and S&T communities must both be engaged in setting research priorities for the SBIR program to ensure the relevance of these efforts to the Department's research goals and to foster transition from SBIR to programs of record. If confirmed, I would emphasize these efforts.

127. In your judgment, are modifications needed to the SBIR program to ensure it meets the Department's goals and is updated to support research costs of the small business community?

At this time, I do not have sufficient information to know whether modifications are needed. If confirmed, I will review the current SBIR programs in detail to determine what additional modifications, if any, may be needed.

128. How will your experience at In-Q-Tel shape and inform your efforts to improve the Department's ability to access innovative defense and commercial small businesses?

I believe my experience has given me unique insights into the start-up community, and I hope that those insights will enable the Department to better utilize what that community has to offer, if I am confirmed. My experiences at IQT also reinforced my belief that innovative solutions often occur at the boundaries of different technology disciplines, and require participation from a variety of communities, to include start-ups, larger companies, government laboratories and FFRDCs, and academia.

Defense Laboratories

129. What is your overall assessment of the technical capabilities and quality of Defense laboratories relative to their Department of Energy, Federally Funded R&D Center (FFRDC), industry, academic, and foreign peers?

My experience with personnel in these labs has been that the technical capabilities and quality of our Defense Laboratory workforce is excellent overall. Of course, if confirmed, I would assess the quality, technical capabilities, focus, and mission performance of the Defense laboratories, and make changes if

necessary. The DoD laboratories' mission-driven work, focusing on the warfighter and our nation's security, makes them unique and irreplaceable assets.

130. What are your views on the most effective management approach for personnel at these facilities?

I believe that the most effective management approaches for the Defense laboratories are ones that provide laboratory leadership with the flexibility needed to shape their workforce to meet the rapidly changing needs of the warfighter.

A review of Defense laboratories operations shows various deficits in personnel management, infrastructure renewal, physical plant recapitalization rate, support services adequacy, etc. Some analyses have indicated that these deficiencies result from excessive centralized control.

131. Do you support significantly increased delegation of operating authority to lab directors?

I am currently unaware of a need to significantly increase delegation of operating authority to lab directors but, if confirmed, I will study this issue and recommend changes as appropriate. It is necessary to ensure some level of centralized coordination to minimize unintended duplication of work and to ensure that resources are being spent on those strategic directions that the Department intends.

132. If confirmed, what steps, if any, will you take to improve the quality, technical capabilities, and mission performance of the Defense laboratories?

If confirmed, I would assess the current quality, technical capabilities, and mission performance of the Defense laboratories. I would then work in collaboration with the heads of the DoD components and through the laboratories to implement any needed changes, and will communicate with Congress regarding significant changes.

133. Would you support transitioning certain laboratory capabilities into FFRDCs or Government Owned-Contractor Operated facilities?

I am currently unaware of any capabilities that should be transitioned to FFRDCs or Government Owned-Contractor Operated facilities. If confirmed, I would make any such recommendations as part of my assessment of laboratory capabilities.

134. What is the appropriate balance for the Department of Defense in leveraging commercial R&D and government-exclusive R&D?

Technology development is increasingly global and much of the base is commercial.

As a result, the Department will need to ensure an appropriate balance between leveraging commercial R&D and government-exclusive R&D to meet our military needs. If confirmed, I will assess our internal DoD research strengths as well as those residing in academia, industry (commercial and defense) and among our allies. It has been my experience that some of the best technology solutions result from collaboration that bridges the research communities in industry, academia, and government laboratories.

135. Do you believe there are research areas of which the Department should divest itself? If so, what are those areas and how can the Department leverage associated commercial efforts?

I am currently unaware of any areas of research that the Department should divest itself of at this time. However, if confirmed, I will execute due diligence to review the entire research portfolio, in conjunction with the DoD Component leadership, and make any such recommendations as needed.

136. Which R&D efforts do you believe should remain exclusively in the control of the Department's laboratories?

While the commercial sector can and should be an important provider of technology and services to meet DoD needs, there are a number of technology areas where I believe that the DoD labs have unique capabilities or experience that are not of interest in the commercial marketplace and therefore not likely to be available in the private sector. These include areas such as chemical and biological weapons, warhead design, and energetic and protective materials, as well as the design, development, integration and testing of weapons systems and prototypes, that I believe should remain under the control of the Department.

Laboratory Personnel Management

The Department of Defense's R&D laboratories perform unique functions in serving national security missions and do not readily fit into the general operational management structure.

137. Would you support increasing the flexibility of the laboratories on personnel matters?

I believe that the quality of the Department's research and development laboratories is completely dependent on the ability of the labs to attract, recruit, and retain top-notch technical talent with skill sets critical to military innovation. Increased flexibility in personnel matters is an important factor in recruiting and retaining the high-caliber workforce needed by the DoD's laboratory enterprise. I support making maximum use of available direct and flexible hiring authorities for scientists and engineers, as well as allowing full use of all Science and Technology Reinvention Laboratory personnel authorities in order to attract the best and brightest talent to the DoD laboratories.

138. Which particular workforce challenges do you believe that the Office of the Under Secretary of Defense for Research and Engineering should focus on first?

Recruiting and retaining a world-class technical workforce is a pressing challenge for the defense research and engineering enterprise. The DoD mission requires specialized scientific and engineering skills and the Department needs to compete effectively to identify and leverage this limited talent pool. I believe that attracting, developing, and retaining talent with critical skills in domains such as advanced microelectronics, cybersecurity, data analytics, and system engineering will be a significant challenge to the entire Department of Defense, to include the Office of the USD(R&E), over the next decade. It is probably worth noting that this is a challenge that extends beyond DoD to the entire national security enterprise.

An additional long-term challenge for the defense research and engineering enterprise is the "graying" of the workforce, within the Office of the USD(R&E), across the Military Departments and Defense Agencies, and within the defense industrial base. If confirmed, I will be attentive to these challenges and implement change to impact the Department's future.

139. How do the personnel flexibilities of the Office of the Under Secretary of Defense for Research and Engineering compare to those of the Defense Advanced Research Projects Agency or the Defense laboratories? Should the Office of the Under Secretary of Defense for Research and Engineering be permitted to use the same hiring flexibilities as these organizations?

Personnel flexibility is critical for recruiting and retaining the best and the brightest in technical enterprises. DARPA and the Science and Technology Reinvention Laboratories (STRs) have special authorities with regard to personnel flexibility that do not apply to the Office of the USD(R&E). If confirmed, I will assess the current authorities that are allowable within the OUSD(R&E) and determine if additional authorities/flexibilities are necessary. If so, I will communicate my assessment and recommendations to the Under Secretary, the Deputy Secretary, the Secretary, and Congress.

140. If confirmed, how will you work with the personnel policy and management communities within the Office of the Secretary of Defense and the military services to ensure that personnel flexibilities are delegated to lab directors and agency heads and are used to the maximum possible extent?

If confirmed, I will coordinate with my counterparts in the OSD and Services personnel policy and management community to ensure that personnel flexibilities are delegated to lab directors and agency heads in a timely manner. I believe empowering individual leaders at the lowest appropriate level is part of the necessary flexibility for effectively managing both laboratories and development projects.

Technical and Acquisition Workforce Issues

141. In your view, does the Department of Defense have adequate technical expertise within the government workforce to execute its designated acquisition and technical development missions?

If confirmed, I will assess the skills and overall health of the current R&E enterprise workforce to determine the ability to execute our acquisition and technical development missions. This assessment will inform my next steps. I will monitor workforce data to ensure the Department maintains its key technical workforce, and will create opportunities for both new and current workforce to expand their expertise. DoD will continue to compete with industry to attract and retain its employees, and it will need the appropriate workforce management authorities and tools to remain a competitive employer. I believe it is critical for the Department to refresh, retrain, and upgrade the skills of its acquisition and technical development workforce through targeted education, training and experience.

142. What is your assessment of the efficacy of the Defense Acquisition Workforce Development Fund?

I see great value in a dedicated fund to ensure the acquisition workforce has what it needs to increase warfighter lethality. If confirmed, I will focus on leveraging the fund for highest impact and emergent technical workforce needs.

143. If confirmed, how would you make use of this fund and what recommendations would you make to improve it?

If confirmed, I would continue to use the Defense Acquisition Workforce

Development Fund to shape the capability and capacity of the technical workforce.

144. What efforts will you undertake, if confirmed, to improve the technical capabilities of the Department in critical areas, such as systems engineering, information assurance, social and cultural sciences, and software engineering?

As the new R&E organization takes shape, the Department will need to retain the talent that currently resides in critical areas such as system engineering and information assurance while gaining additional talent in areas where it currently has shortfalls. If confirmed, I look forward to ensuring that the OUSD(R&E) is appropriately staffed to execute the mission that Congress intends – to set the technical direction of the Department and to ensure that the U.S. retains technical superiority.

145. If confirmed, you will be helping to lead a newly created office. What new or different approaches will you take to staffing and workforce management within your office?

If confirmed, I will work with Dr. Griffin to ensure that the new USD(R&E) organization is properly staffed and structured. We will need to foster an environment of innovation not only in the development of capability but also in how we staff and manage our workforce. If confirmed, I will help Dr. Griffin leverage all available hiring authorities and programs, and be creative in retaining the outstanding talent already there, while adding the additional talent needed to build a deep bench of experience and expertise to meet the organization's goals.

146. If confirmed, to what extent will you make use of term appointments and highly qualified expert hiring authorities?

If confirmed, it is likely that I may identify a number of fast moving technical areas that would benefit from the use of term appointments, but I do not at present know specifically what these might be. I would work with the Services and Agencies to ensure that whatever flexible hiring authorities we possess are used to attract and retain the workforce needed to support the specialized work conducted by the Department.

147. Do you believe that program managers who are active duty military should remain in place in their jobs throughout the duration of an acquisition program?

If confirmed, I would work closely with the Deputy Secretary, the USD(A&S), and the USD (R&E) to ascertain whether this question would fall within my purview. If so, I look forward to assessing this matter. If not, I would work with and support the

decisions of the Deputy Secretary and the USD(A&S) on this issue.

148. Do you believe that Defense Officer Personnel Management Act reform is important for ensuring that military contracting officers have the requisite skills to manage complex, large dollar programs?

I am not familiar with the Defense Officer Personnel Management Act but understand the Department is addressing acquisition workforce skill gaps, including those for military contracting officers. If confirmed, I will work closely with the USD(A&S) who has lead on contracting skill gaps.

149. Do you believe that the Department should make more use of senior, experienced civilian personnel in program management roles?

If confirmed, I would work closely with the Deputy Secretary, the USD(R&E), and the USD(A&S) to ascertain whether this question would fall within my purview.

Defense Advanced Research Projects Agency, Strategic Capabilities Office, and Defense Innovation Unit Experimental

150. What is your view of the appropriate relationship between the Deputy Under Secretary of Defense for Research and Engineering and the Director of the Defense Advanced Research Projects Agency (DARPA)?

I believe DARPA is an essential part of the R&E Enterprise, an organization prized for its long history of taking risks to achieve disruptive and revolutionary capabilities for the warfighter. If confirmed as DUSD(R&E), I would look forward to developing a close relationship with the Director of DARPA. I see this organization as a cornerstone for challenging the status quo and building the foundation of disruptive technologies upon which our future capabilities will be built.

151. What do you believe is the proper research mission for DARPA?

Since its founding, DARPA has a long history of being an effective engine of transformative innovation. DARPA's ability to apply innovative solutions to address some of the most difficult problems that face the DoD, now and in the future, has been the cornerstone of its success. The agile, flexible, and inventive nature of the agency's organizational culture has been successful in driving the pace of technology development for the national security enterprise. I believe the proper role for DARPA is to develop and execute high-risk, high-payoff research projects for the Department.

152. What adjustments do you expect to make, if confirmed, to the current style of DARPA research program management and investment?

Based on my current awareness of the DARPA research program and investment strategy, I do not presently see a need to make significant adjustments to the agency's current strategy. If confirmed, I would ensure that DARPA continues to contribute to the balanced technology portfolio across the Department.

153. What do you believe are the key characteristics of an effective DARPA Director?

I believe an effective DARPA Director should have the ability to develop and communicate a vision of the DARPA research portfolio, attract exceptional technical leadership talent to the agency, motivate teams internal and outside the agency to take on challenges of national importance, connect agency research to the operational and acquisition community, and be prepared to take on the most critical technical challenges that face the Department.

154. What, in your view, is the appropriate relationship between DARPA and the military services' S&T programs?

I believe that the DARPA and the Military Department S&T programs should be coordinated, supportive, and complementary. DARPA is particularly focused on pushing the envelope to develop high-risk, high-payoff, leap-ahead advances, while the Military Department S&T programs draw upon and further develop these and other technological advancements to maintain the broad and deep technology base required to develop innovative capabilities for the warfighter. DARPA's strategy allows the agency to pursue opportunistic thrusts to dramatically advance particular technical capabilities, while the Military Department S&T programs seek a more balanced risk portfolio.

155. What, in your view, is the appropriate relationship between DARPA and the military services' laboratories?

DARPA executes its mission with a workforce that is intentionally temporary (~25% of the program managers leave each year). Unlike the military service laboratories, DARPA does not have the mission to develop and sustain deep technical expertise in a wide array of technology areas relevant to national defense. DARPA program managers often leverage the deep technical expertise within the military S&T laboratories to assist them with development, execution, and independent testing of their programs. Furthermore, the laboratories frequently assist DARPA program managers, who often come from outside the DoD, to develop credible technology transfer plans. During my time at DARPA, I saw this

collaboration as deeply powerful, and if confirmed, I will provide support to ensure that it remains strong.

Offices like DARPA, the Strategic Capabilities Office, and the Defense Innovation Unit Experimental (DIUX) have shown promising results while, like most R&D agencies, also being stymied by the existing bureaucracy.

156. Do you support the missions and work of these offices?

I support the missions of DARPA, the Strategic Capabilities Office (SCO) and the Defense Innovation Unit Experimental (DIUX). These offices each play a distinctly different role, but they are all part of the broader research and development ecosystem that Department relies upon to ensure that it can continue to provide the warfighters with superior technological capabilities, now and in the future.

157. What is your assessment of their efficacy in terms of the transition of capabilities into operational use?

I am most familiar with DARPA, which can certainly point to several success stories regarding technology transition into operational use. Not surprisingly, DARPA's transition successes are typically correlated with active engagement with the end users early in the program development and execution. I do not currently have any real insight into the efficacy of technology transition by either SCO or DIUX.

158. If confirmed, how will you oversee and support the transition of capabilities from these offices into operational use?

If confirmed, I plan to engage with the SCO, DIUX, DARPA, as well as their transition partners and Combatant Commands to seek greater understanding of how well transition is currently occurring, and whether improvements can be made. I will also work with all parties to develop best practices and lessons learned that derive from their experiences.

159. What do you believe is the appropriate management framework for these organizations? Should they continue with current reporting arrangements or work within a new construct?

While I have not had the opportunity to be a part of the discussions to date on the USD(AT&L) reorganization, it is my understanding that the major moves have been coordinated at the highest levels within the Department. If confirmed, I will work closely with Dr. Griffin to ensure that any transition is as seamless as possible.

160. What, in your view, is the appropriate relationship between the Deputy Under Secretary of Defense for Research and Engineering and the leaders of these offices?

If confirmed, I envision a close relationship with the leaders of these offices. I look forward to collaborating with them to deliver technology that transitions into operational use and gives the Department an edge in maintaining technical superiority, both rapidly and affordably.

Missile Defense Agency

161. Do you support the ongoing work and direction in research and engineering at the Missile Defense Agency?

Yes. If confirmed, I look forward to learning about their work.

162. In your opinion, what is the most important work at the Missile Defense Agency in research and engineering and why?

In my opinion, MDA's efforts in ballistic missile defense (to include hypersonics) represent the most important work they do.

163. What do you believe to be the appropriate relationship between the Deputy Under Secretary of Defense for Research and Engineering and the Director of the Missile Defense Agency?

While the Director of the Missile Defense Agency reports to the USD(R&E), as his deputy, if confirmed, I intend to develop a strong relationship with the Director of MDA. This will ensure both Dr. Griffin and I are kept fully informed on the many critical activities and programs that MDA executes for the DoD.

164. Do you believe the Missile Defense Agency appropriately balances its work between procurement and R&D?

I do not presently know. If confirmed, I will review the current work being done at MDA between procurement and R&D.

Science, Technology, Engineering, and Mathematics (STEM) Education

165. Do you believe that the Department of Defense specifically and the nation as a whole are facing a crisis in STEM education?

Yes, the nation's and the DoD's future STEM capacity is at risk. The DoD is the government's largest employer of federal scientists and engineers. STEM education and the maintenance of a vibrant STEM workforce are national security imperatives. If confirmed, I will be a strong advocate for producing a capable, competitive talent pool in STEM fields.

166. In your view, how will this affect the Department's ability to pursue its missions?

The health of the STEM talent pool directly affects Department's ability to pursue its mission and goals. The smaller the pool, the more difficult it will be for the DoD to compete with the private sector for the talent that it needs. If confirmed, I will engage other leadership within the R&E enterprise, to include our Defense Industrial Base, to develop ways to continue to successfully recruit STEM talent, and to provide STEM opportunities to the children of military families.

167. What role do you think the Department should play in supporting STEM education, including for military dependents?

I believe that the Department should be actively engaged at all levels across the STEM education continuum, and should work with the Office of Science and Technology Policy, the National Science Foundation, the Department of Education, and other Federal components involved in national security, to develop a "whole of government" approach to address national security STEM workforce development.

168. What role should the Department play in supporting STEM education opportunities for transitioning service members?

Many transitioning service members have unique, real-world technical training and experience. As they transition out of the military, I believe the Department should encourage their continued STEM education and identify opportunities so that these veterans can incorporate their military experiences into potential science and engineering careers, bolstering our STEM workforce.

Health of R&D Enterprise

169. What is your assessment of the current health of the Department of Defense's R&D enterprise as a whole?

I cannot fully assess the DoD enterprise at present. If confirmed, I look forward to doing so. However, from what I have seen from an external viewpoint, I believe the DoD R&D enterprise is in generally good health. That said, I believe that there are some areas that the Department must address to ensure that it can sustain the capabilities it has and will need in the future. The Department has an aging infrastructure in certain areas, and a significant portion of our S&T workforce is nearing, at, or past its retirement eligibility.

170. Are the statutory authorities, rules, and regulations currently in place to govern the Department's R&D conducive to a healthy enterprise?

At this time I believe that current statutory authorities, rules, and regulations are sufficient to sustain a healthy R&D enterprise, but we must continue to be innovative with the flexible use of authorities to hire and retain critical technical talent. If confirmed, I look forward to examining the health of the enterprise with this question in mind.

171. The Department has recently taken criticism for not devoting enough funding to constructing and upgrading facilities, especially those related to testing, for R&D. If confirmed, how would you address that issue?

Maintaining and improving our R&D facilities is imperative, both from the perspective of allowing our scientists and engineers to do their work and continuing to recruit and retain the most talented people. If confirmed, I will assess the effectiveness of existing authorities that address constructing and upgrading R&D facilities as well as any barriers that may hinder the implementation of those authorities.

172. If confirmed, how would you work to reduce the overall costs of the R&D enterprise, while still maintaining the integrity and quality of the Department's R&D work? In which areas would you strive to build efficiency?

At this time, I have not assessed the efficiency of the current R&D enterprise. If confirmed, I would strongly support efforts that will reduce costs while ensuring the long-term viability, integrity, and quality of our work.

173. How do you think any future budgets under sequestration will affect the Department's S&T funding?

I agree with Secretary Mattis that the lack of budget predictability affects our ability to improve readiness. Effective long-term science and technology (S&T) investment is a critical part of the Department's readiness. The Department has

made efforts to prioritize and protect S&T funding as reflected in prior year budget requests. However, if the full effect of sequester were triggered in any year, I believe that we would face an immediate reduction in S&T budgets and suffer a long-term impact in opportunities lost. If confirmed, I would work with DoD and Congress to do my part to mitigate the harmful impacts of sequestration on the capabilities we deliver to our warfighters.

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.

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

Yes

175. 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 Under Secretary of Defense for Research and Engineering?

Yes

176. 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

177. 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 the committee regarding the basis for any good faith delay or denial in providing such documents?

Yes

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

Yes

179. 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