

Senate Armed Services Committee
Advance Policy Questions for Joseph Jewell
Nominee to be Assistant Secretary of Defense for Science and Technology

Duties and Qualifications

1. What is your understanding of the duties and functions of the Assistant Secretary of Defense for Science and Technology (ASD(S&T))?

From my understanding, the Assistant Secretary of War for Science and Technology (ASW(S&T)) directs the organization responsible for the policy, oversight, and advocacy for the Department of War's (DoW) research enterprise, including the science and technology (S&T) workforce and laboratory infrastructure, Federally Funded Research and Development centers, University-Affiliated Research Centers, and the balance between promotion and protection of defense research. The ASW(S&T) leads the Department's work to create DoW's technology advantage and its critical technology protection policy while also helping to cultivate the next generation of S&T professionals for the Department.

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

Throughout my career, I have been privileged to work at the intersection of advanced science and national defense. My research has focused on hypersonic aerothermodynamics, flight test data analysis, and the development and operation of uniquely capable hypersonic wind tunnel facilities; areas that are not only technically demanding but also strategically vital to our national security. As an active aerospace researcher and educator, I have sent numerous graduates into impactful science and engineering roles in national security in the DoW, national labs, and industry, and have executed hypersonic test programs for the Army, Navy, and Air Force. If confirmed, I will bring to this role a deep commitment to ensuring that the United States maintains its technological superiority over our adversaries. We are in an era of renewed great power competition, where nations including the People's Republic of China are investing heavily in disruptive technologies to challenge our military advantage and the DoW must respond with urgency, clarity, and resolve.

Relations with Congress

3. What actions would you take to create a productive and mutually beneficial relationship between the office of the ASD (S&T) and Congress generally, and this Committee, in particular?

If confirmed, I pledge to develop a productive and mutually beneficial relationship with Congress and the Senate Armed Services Committee. I will actively engage with the Committee on critical research efforts within the S&T office.

Office of the Assistant Secretary of Defense for Science and Technology

The position of the Assistant Secretary of Defense for Science and Technology was created in the FY23 NDAA, but the structure and functions of the office are based on an internal reorganization by the Under Secretary for Research & Engineering (USD(R&E)).

4. If confirmed, what is your vision for the ASD(S&T) office?

President Trump, Secretary Hegseth, and Under Secretary Michael have made clear that peace through strength is the cornerstone of American security. That strength must be underpinned by a robust and agile science and technology enterprise. If confirmed as Assistant Secretary, I will prioritize the acceleration of basic and applied research with relevance for defense needs, in areas like hypersonics, directed energy, and artificial intelligence, while ensuring that our investments are aligned with warfighter needs and national strategic objectives.

I believe that innovation is not just about discovery; it is about delivery. We must shorten the timeline from laboratory breakthroughs to battlefield capabilities. That means effectively leveraging the best of American academia, fostering public-private partnerships, and empowering our defense laboratories to operate with greater flexibility and speed. It also means holding ourselves accountable for results and ensuring that taxpayer dollars are spent wisely and to maximum effect.

5. Could you explain the major functions that will be assigned to you, if confirmed, and the relationship you will foster with the Deputy Assistant Secretaries under you?

From my understanding, the ASW(S&T) directs the organization responsible for the policy, oversight, and advocacy for the DoW research enterprise, including the S&T workforce and laboratory infrastructure, Federally Funded Research and Development centers (FFRDCs), University-Affiliated Research Centers (UARCs), and the balance between promotion and protection of defense research. The ASW(S&T) leads the Department's work to create DoW's technology advantage and its critical technology protection policy while also helping to cultivate the next generation of S&T professionals for the Department. Each of the Deputy Assistant Secretaries work different aspects of this early research ecosystem – foundational and futures capability development and program protection.

- 6. If confirmed, what recommendations, if any, would you make regarding changes to the organization, management, and resourcing of this office to better execute its duties and responsibilities?**

If confirmed, one of my first actions will be to help the USW(R&E) review the S&T organization for how to foster an innovative culture that can move with speed while being efficient. I will work to ensure that our priorities are aligned with the Administration's policies and that our resources have a clear strategy against which to operate. If confirmed, I look forward to reviewing the OUSW(R&E)'s budget including its plans for the Fiscal Year (FY) 2027 budget submission.

- 7. Are there other resources, including staffing billets, that you believe the ASD(S&T) office requires to achieve its mission?**

A thorough review of the staffing and resources within the ASW(S&T) is critical to ensure that the Department is aligned with the President's and Secretary Hegseth's national security priorities. Before taking decisive actions, I will want to thoroughly examine the organization's programs, budget, and authorities and solicit feedback from key stakeholders.

- 8. If confirmed, how would you ensure effective collaboration between your office, the other Assistant Secretaries within USD(R&E), the components within the Office of the Under Secretary of Defense for Acquisition and Sustainment, and the military services?**

Effective collaboration is critical to the success of the Office of the ASW(S&T). The challenges we face are too complex for any one institution to solve alone. If confirmed, I will work closely with other ASWs within the OUSW(R&E), counterparts in Acquisition and Sustainment (A&S), the Military Services, the Combatant Commands, allies, academia, and industry to ensure that our science and technology strategy is unified, coherent, and mission-driven.

In the current organizational chart for the USD(R&E), the Defense Technical Information Center (DTIC) is overseen by the ASD(S&T).

- 9. How would you describe the functions and value of DTIC to the Department of Defense (DOD)? Can you provide some examples of how DTIC is supporting the Department and the research enterprise?**

The Administrator of the Defense Technical Information Center (DTIC) is a direct report to the USW(R&E). On behalf of the OUSW(R&E), DTIC administers S&T policy, captures the results of research into a central repository of knowledge, and

delivers that knowledge to the community. DTIC reaches across Military Service and Defense Agency silos to connect people and activities. On behalf of the OUSW(R&E), DTIC operates information analysis centers that manage research and development contracts supporting research and analysis services to DoW. If confirmed, I would look for opportunities to increase the value that DTIC could provide to DoW.

10. If confirmed, what recommendations would you have for improving the operations of DTIC, as well as how to improve its integration to better support the functions of the Department and the research enterprise?

As a research scientist at AFRL, I was a frequent and active user of DTIC and have continued to refer to resources found there as an academic researcher. If confirmed, I look forward to learning more about DTIC's operations and to reviewing ways to improve its integration to better support functions of the Department and the research enterprise and removing roadblocks that unnecessarily hamper qualified individual's access to these resources. I will work to ensure that our priorities are aligned with the Administration's policies and that our resources have a clear strategy against which to operate.

In the current organizational chart for the USD(R&E), the Joint Hypersonics Transition Office (JHTO) is overseen by the ASD(S&T).

11. How would you describe the functions and value of JHTO to the DOD? Can you provide some examples of how JHTO is supporting the Department and the research enterprise?

I understand that Congress stood up the Joint Technology Office on Hypersonics (JTOH) in the National Defense Authorization Act for Fiscal Year 2007, which directed the Secretary of Defense to coordinate and integrate hypersonic research, development, test and evaluation programs and system demonstrations programs across the Department. I understand that one success of the JTOH, which Congress renamed to the Joint Hypersonics Transition Office (JHTO) in 2018, is the development of the Prompt Global Strike (PGS) program, which initiated the technologies that would become the Army's Long Range Hypersonic Weapon (LRHW), the first fielded hypersonic strike capability, and the Navy's Conventional Prompt Strike (CPS) program, leveraging the common glide body first developed under the GPS program. I understand that the JHTO continues to develop early-stage hypersonic-enabling technologies through its management and sponsorship of the University Consortium for Applied Hypersonics, which is helping develop advanced manufacturing approaches for hypersonics, new materials such as ceramics for high temperature applications, and pursuing novel compositions for solid rocket motor fuels.

12. If confirmed, what recommendations would you have for improving the operations of JHTO, as well as improving its integration to better support the functions of the Department and the research enterprise?

If confirmed, I would thoroughly assess the University Consortium for Applied Hypersonics to ensure that the Department is optimally leveraging the best of the university research enterprise to advance hypersonic goals. I would further review the statutory authorities of the JHTO to ensure it is doing everything in its power to support and enforce the hypersonics development roadmap while avoiding duplication and unnecessary delays in action.

Major Challenges and Priorities

13. What are the major challenges facing the science and technology enterprise, in your view?

If confirmed as Assistant Secretary, I will prioritize the acceleration of basic and applied research with relevance for defense needs, in areas like hypersonics, directed energy, and artificial intelligence, while ensuring that our investments are aligned with warfighter needs and national strategic objectives.

I believe that innovation is not just about discovery; it is about delivery. We must shorten the timeline from laboratory breakthroughs to battlefield capabilities. That means effectively leveraging the best of American academia, fostering public-private partnerships, and empowering our defense laboratories with flexibility and speed. It also means holding ourselves accountable for results and ensuring that taxpayer dollars are spent wisely and to maximum effect.

14. If confirmed, what would you do to address each of these challenges?

If confirmed as the ASW(S&T), I look forward to reviewing the portfolio of S&T investments across both the OUSW(R&E) and the Department in order to create an appropriate strategy. For basic research, DoW programs should be breaking new ground that has the potential to be disruptive and change accepted paradigms for the warfighter. These basic research programs should cast a wide net to ensure that novel, but promising technologies have a chance to be explored and developed. As S&T research becomes more mature, they should become more focused and should be measured on how well they align with enhancing specific DoW capabilities. If confirmed, I will work closely with the Military Services, the Combatant Commands, allies, academia, and industry to ensure that our science and technology strategy is unified, coherent, and mission-driven.

15. If confirmed, what broad priorities would you establish that you believe should be addressed by your office? What recommendations would you make regarding priorities to the USD(R&E)?

Capitalizing on technology leaps that arise once in a generation is the key broad priority for the OUSW(R&E). For example, learning how to utilize and deploy assured artificial intelligence capabilities to the maximum extent while leveraging private sector innovation and investments; ensuring the military fully benefits from the revolution of quantum computing; and pioneering novel and advanced domestically developed materials. If confirmed, I would work with the USW(R&E) to assess the Department's efforts in these pivotal technologies to ensure the Department is able to sustain or take the lead over near-peer adversaries.

16. In your view, which technologies do you consider the highest priorities for DOD to develop based on their ability to contribute to the Department's mission in the short- and longer-terms?

If confirmed, I look forward to working with the USW(R&E) to identify the highest priority technologies for development. My personal view is that AI, hypersonics, directed energy, and biotechnology are among the technologies needed to contribute to the DoW mission. The OUSW(R&E) must balance addressing short-term capability gaps with the need to invest in long-term strategies to meet the missions of the future, while being fully informed on the threat perspective and armed with the most relevant intelligence reports.

17. If confirmed, how would you connect the Office of the Secretary of Defense's technology strategies and plans with the efforts of other military services and combatant commands?

Each Military Service carries out its S&T planning to address its specific needs. This is necessary, but there is a risk that needs that are common across the Military Services are not adequately prioritized by each Military Service. The OUSW(R&E) is crucial to ensuring that the individual Military Service plans take into account Joint needs and new technology opportunities. The oversight of Military Service S&T planning and fostering of collaboration between the Military Services on technology development in areas of common interest is a critical role that the OUSW(R&E) must fulfill to ensure a strategy that results in a robust, truly Joint S&T Enterprise. If confirmed, I look forward to working with the Military Services and the Combatant Commands to identify and incorporate their requirements for current and future technology strategies in order to address future warfighter needs.

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

If confirmed as Assistant Secretary, I will prioritize the acceleration of basic and applied research with relevance for defense needs, in areas like hypersonics, directed energy, and artificial intelligence, while ensuring that our investments are aligned with warfighter needs and national strategic objectives.

19. In your view, are there any technology areas that should be added or removed from the current list of DOD's modernization priorities? If so, please explain your rationale.

If confirmed, I look forward to reviewing the work being done in the Department's list of Critical Technology Areas and ensuring the Department's resources are focused on our most critical challenges.

Investment in Science and Technology

20. If confirmed, what metrics would you use to assess the suitability of the portfolio of investments made under the defense science and technology (S&T) program to include the magnitude and diversity of the investments?

The Department's S&T investments can and should align to key operational challenges and opportunities faced by the Joint Force, and if confirmed, I will assess the DoW S&T portfolios to see if research areas are well mapped to address capability shortfalls and stay ahead of the threats. Such challenges and opportunities are driven both by top-level strategic guidance as well as by direct interaction and collaboration with the Military Services, the Combatant Commands, allies, and partners. Science and technology often take a longer view than other investments, addressing future military needs through deliberate, targeted investment. Since there is uncertainty about which technologies could provide revolutionary capabilities in the future, robust S&T investments must ensure our nation is able to exploit emerging technology areas, informing new asymmetric warfighting capabilities, and reducing risk of technological surprise by potential adversaries. An important metric would be comparison in capability to adversaries, but also the degree to which DoW has advanced new technologies that don't exist elsewhere and is doing so at a predictable cost and timeframe.

21. In your view, should the Secretary of Defense's Defense Planning Guidance include guidance on minimum funding levels for the science and technology programs of the Military Departments? Please explain your answer.

If confirmed, I understand it would be my role to make recommendations to the Secretary on the budgets for research, development, testing, and evaluation (RDT&E), and that would include participating in the development of the Defense Planning Guidance (DPG) that influences the budget of the Department. I will work with the requisite stakeholders to ensure Department budgets are sufficient to accomplish RDT&E missions for the entire DoW.

22. Do you believe that the Defense Planning Guidance should include guidance on minimum investment levels for the research and testing infrastructure of the Military Departments? Please explain your answer.

As noted by Secretary Hegseth, it is President Trump's priority to achieve peace through strength. If confirmed, I understand it would be my role to make recommendations to the Secretary on the budgets for RDT&E, and that would include participating in the development of the DPG that influences the budget of the Department. I will work with the requisite stakeholders to ensure Department budgets are sufficient to accomplish RDT&E missions for the entire DoW.

23. What role should the ASD(S&T) play in the detailed development and coordination of Military Department and Defense Agency/Field Activity S&T investment strategies, programs, and budgets, in your view?

The ASW(S&T) should play a critical role in the development and coordination of S&T investment strategies, programs, and budgets for the Military Departments and the Defense Agency/Field Activities, maximizing return on investments for joint applications.

24. What role should the ASD(S&T) play in the development and coordination of Military Department research and test infrastructure investment strategies, programs, and budgets, in your view?

The ASW(S&T) should play a critical role in the development and coordination of research and test infrastructure investment strategies, programs, and budgets for the Military Departments and the Defense Agency/Field Activities, maximizing return on investments for joint applications.

25. What S&T areas, if any, do you consider underfunded by the DOD?

If confirmed, I look forward to reviewing the OUSW(R&E)'s budget to better understand what, if any, critical technology areas may need additional funding.

26. In your judgment, how will the lack of funding in these areas affect the Department's ability to meet the threats of the future? Please explain your answer.

In general, the Department should seek to fully fund critical technology areas to meet current and future threats. If confirmed, I would look forward to reviewing the Department's S&T budget plans to understand what, if any, S&T programs within my areas of responsibility may need additional resources.

27. If confirmed, what factors would you consider in assessing whether the Department's S&T investment strategy strikes the appropriate balance between funding innovative, disruptive technologies and addressing near-term operational needs and military requirements?

Balancing near-term and long-term investments is a persistent, multifaceted challenge that demands addressing immediate warfighting needs while also maintaining long term technical superiority over adversaries. Key to this task is aligning investments in critical technology and capabilities with warfighter needs that are derived from our national strategy. This involves balancing multiple lines of effort, including modernizing existing systems, developing new emerging technologies, and ensuring a robust, vibrant national security industrial base. Short-term investments should include transitioning impactful capability to operational use, while long-term investments should involve high risk, high reward activities that have the potential for revolutionary leaps in capability. An important enabler for striking this balance between incremental vs. disruptive progress is continual risk assessment and adaptive budget processes to keep pace with ever-evolving adversaries. I would coordinate closely with the Joint Staff, the Combatant Commands, and the Military Services to ensure our investments are aligned to Warfighter needs. The Department must also possess transparent, effective accounting systems to track spending.

28. In your view, what are the critical legacy technology areas where DOD has needs that may not be met by industry or academia and we should be maintaining steady, sustaining investments to ensure warfighting capability?

This is an important question that is probably best answered once I have been fully informed, if confirmed. In my preparation for this hearing, I have seen multiple examples of "dual use" technologies where the Department benefits from the economies of scale and performance improvement pace that is driven by demanding civilian commercial competition. The Critical Technology Areas have a mix of suppliers ranging from existing companies with established commercial markets to new companies with yet-to-be established emerging commercial markets. Maintaining investments to ensure competitive opportunities to those with established commercial markets has the desired effect of increasing resilience if a part of them have U.S.-based supply chains. Likewise, maintaining steady investments to ensure competitive opportunities to those with emerging commercial markets has the desired effect of increasing diversity by adding multiple reliable suppliers for DoW to access.

29. If confirmed, how would you ensure the Department's leadership is aware of successful efforts resulting from investments in science and technology programs that support defense missions?

If confirmed, I will seek opportunities to ensure the Secretary, Deputy Secretary, the USW(R&E), and other senior leaders are made aware of successful efforts resulting from Critical Technology Area investments, including by promoting their participation in engagements such as the OUSW(R&E)'s experimentation program. Additionally, I will communicate success stories up the chain of command and throughout the senior leadership.

Section 236 of the FY23 NDAA required a strategy and plan for fostering and strengthening the defense innovation ecosystem.

30. What plans, if any, do you have to build off that strategy to leverage the strengths of geographic clusters of technology expertise across the US to better tap into the human capital, infrastructure, and state/local economic investments to expand the DOD innovation ecosystem?

If confirmed, I look forward to reviewing previous strategies focused on developing and expanding the defense innovation ecosystem. President Trump, Secretary Hegseth, and Under Secretary Michael have made clear that peace through strength is the cornerstone of American security. That strength must be underpinned by a robust and agile science and technology enterprise. If confirmed as Assistant Secretary, I will prioritize the acceleration of basic and applied research with relevance for defense needs, in areas like hypersonics, directed energy, and artificial intelligence, while ensuring that our investments are aligned with warfighter needs and national strategic objectives.

I believe that innovation is not just about discovery; it is about delivery. We must shorten the timeline from laboratory breakthroughs to battlefield capabilities. That means effectively leveraging the best of American academia, fostering public-private partnerships, and empowering our defense laboratories to operate with greater flexibility and speed. It also means holding ourselves accountable for results and ensuring that taxpayer dollars are spent wisely and to maximum effect.

Basic Research

31. 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 to measure the success of DOD basic research programs and investments, if confirmed?

Basic research programs have played a unique and critical role in exploring new scientific directions for revolutionary technology development in support of the DoW

mission and continue to do so. For example, in the near-term, success includes generating a talented workforce that is able to continue developing solutions for DoW and the emergence of technologies into production by DoW and the private sector. The velocity of basic research maturing into usable technology is a key measure that allows for more long-term investment because of the confidence it builds in the choices that lead to the start of new investments. Longer-term success involves integrating technologies taken from the laboratories into programs of record and dual-use technologies acquired by the Department. Brand new integrated approaches to evaluate the potential impact of discovery-focused basic research programs are needed to facilitate the planning of transition efforts, accelerate innovation, but also better assess the DoW-relevant scientific innovations versus those of our pacing competitors.

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

I support the President's 2026 budget request for DoW basic research. DoW basic research programs have benefitted from consistent budgetary support over the last decade, but near-peer competitors, especially China, are increasing their investments in basic research more quickly than DoW, while leveraging lower labor costs and benefitting from intellectual property theft. It is vital to have strong support for basic research in the Department, because otherwise there is a significant risk that China and other nations will be in the lead in fields critical to DoW in the future. Further, it is incumbent on the R&E Enterprise to be efficient in using its budget to produce more than it has in the past.

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

Unfettered exploration in areas of defense interest is vital to the Department's generation of transformative capabilities and to ensuring that our Warfighter maintains a technological advantage over near peer competitors. If confirmed, I would work to ensure that such investments are sustained and are properly focused in areas of potential interest to the Department.

34. Based on your experience in academia, could you explain what potential impact dramatically reducing the indirect cost rates for university research might have on the overall buying power of our DOD basic research funding?

Public service in the interest of national security has been a hallmark of my 20-year career focusing on advancing technological capabilities for our Nation. In my current capacity as the Director of the HYPULSE hypervelocity tunnel and Director of the Boeing/AFOSR Mach 6 Quiet Tunnel for Purdue University, I appreciate the

enduring relationship that university shares with the OUSW(R&E). I understand that the Administration is reviewing the appropriate overhead costs associated with universities in a variety of areas. If confirmed, I will carefully review these efforts to ensure that we are making the best use of taxpayer dollars.

Research Security and Program Protection Planning

35. If confirmed, how would you ensure that DOD's basic and applied research programs are executed in a manner consistent with National Security Decision Directive 189 and National Security Presidential Memorandum 33?

It is my understanding that National Security Decision Directive (NSDD) 189 has been executed through previous USW(R&E) memoranda and broadly defines fundamental research at the Department as basic and applied research performed at universities or basic research performed at defense labs and in industry. NSPM 33 directs review of all fundamental research projects to protect against foreign government interference and exploitation. If confirmed, I would continue to carry out this NSDD and this NSPM unless modified or suspended by new directives promulgated by the President.

36. What efforts would you make, if confirmed, to enable the Department to benefit from open innovation in fundamental research, while protecting such research from undue foreign interference?

Fundamental research is critical to the Department in generating the science behind the next great advances in warfighter capabilities. If confirmed, I would seek to balance open inquiry against the Department's research security needs as currently described in NSPM 33 and other relevant statutes and directives.

37. If confirmed, what are your ideas for working with the academic community to limit undue foreign influence on university research programs, and limit unwanted foreign access to research expertise and results without creating an undue burden on the open and collaborative nature of the research community?

I believe that the academic community, the DoW, and the science funding agencies should work collaboratively to solve the problem of undue foreign influence on university research programs in an efficient and implementable way. If confirmed, I will work with the Office of Science and Technology Policy and other interested science funding agencies to implement consistent policies and procedures for our research community. Consistent training, awareness, and education to and by the institutions are critical to limit undue foreign influence in university research programs that support the Department.

38. In your view, what steps could the ASD(S&T) put in place to ensure that regulations pertaining to Department-funded university research are

consistently applied and monitored by DOD, and ensuring they are well understood by the university community?

If confirmed, I would work with the USW(R&E) to prioritize promulgating and implementing clear, consistent policies across the Department with exceptions made speedily if proven to be needed. The Department should work with university leaders to clearly explain what the Department wants, and also to learn from them where burdens can be reduced without reducing effectiveness.

39. If confirmed, what steps would you take to protect U.S. research and intellectual property from undue foreign influence without unreasonably singling out researchers from certain nations?

Intellectual property generated by industry and the results of U.S. funded research is the bedrock of our economic and national security. If confirmed, I will ensure the Department's due diligence review for small businesses and university research are conducted based on a clear set of objective criteria in alignment with the statute and this Administration's priorities.

40. In your opinion, are there ways to better coordinate and streamline the research security guidance to universities and the Program Protection Planning carried out by the government? For example, are there data sharing systems to improve visibility for academia, industry and the government?

A holistic approach to research security and program protection, to include improving and streamlining information sharing, is vital to rapidly and securely fielding capabilities to our warfighters. If confirmed, I will pursue digital modernization opportunities to improve visibility of relevant information such as adversaries' problematic behavior, potential mitigating actions, and security posture best practices while reducing administrative burden to academia, industry, and program offices.

41. Do you commit to supporting regular updates of the list of foreign entities that have been confirmed as engaging in problematic activity as described in Section 1286 of the Fiscal Year 2019 National Defense Authorization Act, as amended?

Yes.

Expanding the DOD Academic Research Base

42. If confirmed, what steps would you take to increase DOD research engagement with Historically Black Colleges and Universities and other Minority-Serving Institutions?

I am familiar with the investment that the Department has been making with the HBCU/MSI community. I understand the current focus is on maximizing the return on the Department's resources, through centers of excellence, internships, and scholarships. Outreach is a critical aspect of this effort. If confirmed, I will continue to look for engagements that can promote our goals, ensure alignment with S&T priorities, and increase engagement with HBCUs and MSIs.

43. If confirmed, what steps would you take to increase DOD engagement with universities participating in the Defense Established Program to Stimulate Competitive Research?

My understanding is that the Defense Established Program to Stimulate Competitive Research (DEPSCOR) works to increase research capacity at universities that have not worked with the Department much in the past. If confirmed, I would make sure that the Department is engaging with these universities as much as possible to help researchers there better align with DoW research priorities and better understand how to work with the Department. The Department's research efforts can only benefit from having more universities to work with. Based on what I know about the DEPSCOR program, and my experience serving as a mentor for a DEPSCOR proposal, I intend to be very supportive.

44. If confirmed, what steps would you take to increase the funding for, and quality of, fundamental research at defense laboratories?

If confirmed, I will ensure a balanced research portfolio to include looking for opportunities for collaboration with academia and industry, increasing scientific integrity, and actively engaging with our allies and their defense S&T enterprises.

45. If confirmed, what would you do to expand DOD's academic research base to include more researchers from the social sciences, medical sciences, management and business schools, and other disciplines relevant to defense missions?

If confirmed, I look forward to learning more about the Department's work to expand the academic research base to multiple disciplines in support of broader defense research and engineering needs. I will work to ensure that our priorities are aligned with the Administration's policies and that our resources have a clear strategy against which to operate.

Science and Technology Activities of Civilian Agencies

46. Do you believe that Department of Defense and other national security missions benefit from robust funding for scientific research in other civilian agencies? Please explain your answer.

I believe that national security in general, and the Department specifically, absolutely benefit from robust funding at civilian science agencies. At the same time, DoW should not ignore private sector innovations either. The DoW must apply a broad sense of non-duplication.

47. What is your understanding of how the following civilian science agency activities support Department of Defense missions?

- **National Science Foundation basic science funding**

From my understanding, the National Science Foundation (NSF) supports basic research and education in the non-medical sciences and engineering with a mission to promote the progress of science, advance the national health, prosperity and welfare, and secure our national defense. NSF is the most profound source of federal funding for basic research and the top source of federal funding for basic research in the fields of computer science and mathematics, environmental science, and the social sciences.

- **National Aeronautics and Space Administration (NASA) hypersonics and other space research and NASA testing facilities**

The Research Directorate (RD) at NASA's Langley Research Center houses NASA's hypersonics, space research, and testing facilities as it provides the premier research and technology development capabilities to the Agency and the nation. In my work as an AFRL research scientist and a professor I have collaborated closely with NASA Langley's hypersonics branch, sent several of my PhD students to intern there, and hosted Langley researchers to perform experiments with my wind tunnel lab group at Purdue. From my understanding, NASA's Hypersonic branch activities within RD include the Hypersonic Breathing Propulsion Branch (HAPB), Hypersonic Airbreathing Propulsion Branch, and Supersonic/Hypersonic Testing Branch with the overall mission to conduct multidisciplinary research to advance tools and technologies for hypersonic systems in support of our Nation's objectives.

- **National Institutes of Health medical research and vaccine development activities**

From my understanding, the National Institute of Allergy and Infectious Diseases (NIAID) within the National Institutes of Health (NIH) conducts and supports basic and applied research to better understand, treat, and ultimately prevent infectious, immunologic, and allergic diseases. Among its many areas of responsibility, the NIAID also provides the foundation for developing medical products and strategies for biodefense and countering emerging and re-emerging infectious diseases. If confirmed, I look forward to exploring opportunities to

collaborate with the NIAID to synchronize and advance our Nation's research to target pathogens that pose high risks to public health and our national security.

- **National Institute of Standards and Technology cybersecurity, quantum science, and manufacturing research programs**

From my understanding, the National Institute of Standards and Technology (NIST) is an agency within the Department of Commerce mandated to offer support to the private sector for the development of precompetitive generic technologies and the diffusion of government-developed innovation to users in all sectors of the American economy. The NIST's Information Technology division develops cybersecurity and privacy standards, guidelines, best practices, and resources to meet the needs of U.S. industry, federal agencies, and the broader public. The NIST also spearheads quantum information science research, developing measurement science techniques, tools, and related standards to enhance the competitiveness of the U.S. quantum industry and the economic well-being and national security of the United States. Based on decades of fundamental research, quantum technologies developed by the NIST have provided transformative solutions for national challenges as it continues to play a pivotal role in American leadership in quantum information science.

The OUSW(R&E) leads cybersecurity applied research efforts to explore technical and scientific concepts that address challenges in the Joint Warfighting Environment in addition to leading research and development to transition quantum technologies into our nation's military capability portfolio. If confirmed, I look forward to synchronizing efforts with the NIST to develop and deliver cutting-edge capabilities to our warfighters and maintain our technological edge against strategic competitors.

48. Are there areas where you believe DOD is dependent on funding and programs from other civilian science organizations, where funding cuts might negatively impact DOD missions? If so, please explain?

The Department's S&T investments can and should align to key operational challenges and opportunities faced by the Joint Force, and if confirmed, I will assess the DoW S&T portfolios to see if the research areas are well mapped to address capability shortfalls and stay ahead of the threats. These particular challenges and opportunities are driven both by top-level strategic guidance as well as by direct interaction and collaboration with the Military Services, the Combatant Commands, allies, and partners. Science and technology often take a longer view than other investments, addressing future military needs through deliberate, targeted investment. Since there is uncertainty about which technologies could provide revolutionary capabilities in the future, robust S&T investments must ensure our nation is able to

exploit emerging technology areas, informing new asymmetric warfighting capabilities, and reducing risk of technological surprise by potential adversaries. An important metric would be comparison in capability to our adversaries, but also the degree to which DoW has advanced new technologies that don't exist elsewhere and is doing so at a predictable cost and timeframe.

49. Are there areas where you believe DOD should shift the burden on funding and programs for some activities to other civilian science organizations? If so, which missions and which agencies?

If confirmed, I would look forward to reviewing the Department's S&T budget plans to understand what, if any, S&T programs would be more appropriately shifted to other civilian science organizations.

50. If confirmed, how would you work with other federal agencies and the Office of Science and Technology Policy to improve coordination of research activities and harmonization of research funding decisions?

The OUSW(R&E) works with the Director of the White House Office of Science and Technology Policy on topics of interest to both the White House and across the Federal Government. Also, it is my understanding that the Office of Science and Technology Policy establishes committees to work on issues including science, technology, engineering, and mathematics (STEM) education and workforce development, research security, and other matters as they arise. These committees are composed of experts from each of the Federal science funding agencies and work on reports and memoranda that advance the Administration's scientific agenda.

Emerging Technology Areas

The ASD(S&T) is responsible for four of the 14 critical technology areas of the Department: Advanced Materials, Biotechnology, FutureG/5G, and Quantum Science.

51. Please describe what you believe are the main challenges and opportunities for the Department in each of the aforementioned four categories? Please be detailed in your description.

To implement the Department's goal of global technological leadership, the OUSW(R&E) designated critical technology areas for targeted development. For each critical technology, the OUSW(R&E) develops roadmaps, conducts rigorous program assessments, and plans technical activities with partners across the Military Services, the defense laboratories, and private industry.

Advanced materials explore innovative new materials and novel manufacturing techniques that can dramatically improve many of the Department's capabilities. Materials that have higher strength, lighter weight, higher efficiency, and can handle more extreme temperatures will have the potential to better improve the survivability of our service members and enhance their ability to accomplish their missions. Also, it is critical to research the availability of new materials or substitutes for minerals not domestically sourced.

Investing in biotechnology and biomanufacturing offers a strategic advantage, enabling a more resilient, adaptable, and capable military force. While I am not fully read into the Department's biotechnology programs, the United States has many of the world's leading public and private research institutions, with more biotechnology patents, companies, and Nobel Prize winners than any other country.

Future generation wireless technology (FutureG) is crucial for the Department as it forms the backbone of effective military operations. I am aware that the FutureG Office within the OUSW(R&E) began a multi-year effort to develop, and demonstrate prototype "dual use" networks, applications, and enhancements designed to stimulate interest in demand for Fifth Generation (5G) networks in DoW and the commercial world. Through this, I believe the Department will continue to look for opportunities to adopt and advance commercial technologies for symmetric warfighter advantage to meet DoW technical capability requirements while also increasing U.S. innovation and leadership.

Quantum sciences present an opportunity to deliver exceptional technologies for our warfighters. The OUSW(R&E) identified three quantum application domains (quantum computing, sensing, and communications) as priorities with potential yield operational applications in the near term. For example, the OUSW(R&E) actively partners with the Defense Advanced Research Project Agency to engage the domestic and allied private sector on their quantum computing approaches.

52. If confirmed, how would you coordinate research across the military departments to reduce unwarranted duplication and synchronize the investments being made outside of the Office of the Secretary of Defense (OSD)?

Coordinating research across the military departments to reduce unwarranted duplication is a critical task for the ASW(S&T). I would coordinate closely with the Joint Staff, the Combatant Commands, and the Military Services to ensure our investments are aligned to Warfighter needs. The ASW(S&T) should play an important role in the development and coordination of S&T investment strategies, programs, and budgets for the Military Departments and the Defense Agency/Field Activities, maximizing return on investments for joint applications.

53. If confirmed, how would you integrate industry, academia, and international investments in S&T and R&D for these disciplines into your strategic investment decision process?

Fostering, and then capitalizing on technology leaps that arise once in a generation is the key broad priority for the OUSW(R&E). Many of these advancements take place in industry, academia, and international investments and it is critical that the Department take advantage. For example, learning how to leverage and deploy assured artificial intelligence capabilities to the maximum extent while leveraging private sector innovation and investments. I would work with the USW(R&E) to assess the Department's efforts in these pivotal technologies to ensure the Department is leveraging capabilities developed outside of the Department.

54. In your opinion, how should the Department be integrating ethical, legal, and societal implications considerations up front in the formulation of new research programs?

Ethical, legal, and societal implications should be considered when developing any new research program.

55. If confirmed, how would you work with other parts of the Department to inform operational users on the possibilities in each of the four technology areas to improve the chances of future transitions by creating a demand signal early for the technology and research from these programs?

The current technology transition process is challenged, and I would consider ideas to create an early demand signal in S&T's four Critical Technology Areas. The primary transition challenge is the availability of funding in the year of execution or lack of clarity that the capability is on the path to becoming a funded program. As technologies emerge, funding must be available to support transition. The current Planning, Programming, Budgeting and Execution process provides limited flexibility for accelerated fielding, and DoW must improve the visibility it gives to the suppliers on their chances of succeeding within DoW.

56. The National Security Commission on Emerging Biotechnology just released its final report. What are your views on their recommendations, and are there any recommendations that you have identified that you would like to champion within DOD?

I have read the report and the Commission's recommendations. Biotechnology and biomanufacturing provide innovative tools and capabilities that directly support DoW missions, strengthen domestic supply chains, and reduce reliance on foreign sources for critical materials. If confirmed, I look forward to supporting the Department's

investments in biotechnology. I understand that some of the Commission's recommendations have been included in the National Defense Authorization Acts under consideration in the House and Senate. If confirmed, I look forward to providing the Department's official response on those recommendations.

Technology Strategy

57. What weaknesses, if any, do you perceive in the current defense S&T strategic planning process?

Each Military Service carries out its S&T planning to address its specific needs. This is necessary, but there is a risk that needs that are common across the Military Services are not adequately prioritized by each military Service. The OUSW(R&E) is crucial to ensuring that the individual Military Service plans take into account Joint needs and new technology opportunities. The oversight of Military Service S&T planning and fostering of collaboration between the Military Services on technology development in areas of common interest is a critical role that the OUSW(R&E) must fulfill to ensure a strategy that results in a robust, truly Joint S&T Enterprise. Cooperation with the various S&T organizations could help to limit 'requirements creep' and any capability falling through the cracks of various organizations.

58. What do you believe to be the key attributes of a good technology strategic plan and how could these attributes be carried through effectively to the DOD programming and budgeting purposes?

Very little technology development has an impact in a vacuum. Good strategic planning must incorporate the many stakeholders involved in research, qualification, acquisition, fielding, and sustainment. Strategic planning for groundbreaking technology must also identify connections to the Military Services and program offices to influence requirements rather than just respond to them. Moreover, a good technology strategic plan should balance technology push for global competitiveness with requirements pull, both addressing future warfighter needs. The plan should include near, mid- and far-term capability goals and technology objectives, and integrated across the department to ensure meaningful and cost-efficient progress. Additionally, an effective technology strategic plan should provide clear development metrics, identify where defense fits into the larger commercial investments in dual use technologies, and define a timeline for technology insertion into the acquisition process.

59. If confirmed, how would you ensure reliance on technology strategic plans as foundational elements of the budget, planning, and programming process?

The OUSW(R&E) maintains senior officials for technology areas deemed critical to national defense, who are responsible for ensuring that science, technology,

engineering, prototyping, and demonstration investments are effectively leveraged and fully aligned with DoW's priorities. If confirmed, I will support Under Secretary Michael's assessment of whether the Critical Technology Areas are well aligned with the Interim National Defense Strategic Guidance. I will ensure that senior officials, as well as other staff within the OUSW(R&E), collaborate closely with the Director of Cost Assessment and Program Evaluation, the Office of the Under Secretary of War (Comptroller), and the Military Services to ensure that technology strategic plans are foundational elements of the budget, planning, and programming process. There, however, must be an acknowledgement that the validity of any strategic plan has been reduced in time. These plans must have elements that can be revisited in shorter timeframes if the situation demands.

60. Do you have any recommendations for how the Department's authorities for licensing DOD-developed technology and intellectual property could be better leveraged to entice new technology entrants into the Department's defense industrial base?

Intellectual property generated by industry and the results of U.S. funded research is the bedrock of our economic and national security. As a nominee, I have not been read into the specifics behind the Department's licensing authorities. However, if confirmed, I will ensure the Department's due diligence reviews for small businesses and university research are conducted based on a clear set of objective criteria in alignment with relevant statutes and this Administration's priorities.

Technology Transition

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

The current technology transition process is challenged. The circumstance is the availability of funding in the year of execution or lack of clarity that the capability is on the path to becoming a funded program. As technologies mature and are proven, funding must be available to support transition. The current PPBE process provides limited flexibility for accelerated fielding, and DoW must improve the visibility it gives to the suppliers on their chances of succeeding within DoW.

62. In your view, what challenges exist in technology transition in DOD?

The pace of change in technology development and on the battlefield has become much faster than the pace of change of requirements. The Department is too slow to develop the demand signal for a new capability to be relevant. If confirmed, I will attempt to help make the OUSW(R&E) a driver of future requirements to ensure we are investing in and fielding the right things at the right time.

63. What would you do, if confirmed, to address each of these challenges?

The OUSW(R&E) can leverage the Accelerate the Procurement and Fielding of Innovative Technologies (APFIT) program to address the problem of the mismatch between the pace of budgeting and the pace of development; the APFIT program is successfully enabling innovative companies to bridge funding timelines and get technology into production up to two years sooner. If confirmed, I would support the ASW for Mission Capabilities on APFIT and other programs under the OUSW(R&E) that contribute to mitigating the transition challenge. The Department can also improve the relevance of its technology development cycles through leveraging multi-service collaboration and operational experimentation with the Combatant Commands.

64. As compared to other technologies, do you believe that a different methodology is needed to transition software capabilities from research to operational use?

I was excited to see that earlier this year Secretary Hegseth signed a memorandum recognizing that today's reality is "software-defined warfare" and directing all DoW Components to broadly modernize their approach to software acquisition. I look forward to supporting the Secretary in driving software modernization across the research and engineering portfolio.

65. What is your understanding of the role of the ASD(S&T) in facilitating communication between technical communities, acquisition personnel, and end users to support or speed technology transition?

The oversight of Military Service S&T planning and fostering of collaboration between the Military Services on technology development and transition in areas of common interest is a critical role that the OUSW(R&E) must fulfill to ensure a strategy that results in a robust, truly Joint S&T Enterprise. Through this oversight role, the ASW(S&T) can facilitate effective communication between technical communities, acquisition personnel and end users to support and speed up technology transition.

66. What are your views as to whether DOD's approach to, and processes for, funding technology transition must be changed? What sort of changes, if any, would you recommend, if confirmed?

If confirmed, I look forward to supporting the USW(R&E) on examining the Department's approach and processing for funding technology transition. An important challenge is the traditional budget process for emerging solutions. This has historically posed significant challenges for small businesses and other innovative businesses that desire to work with DoW. Flexibility in funding is critical to accelerate prototyping, transition, and fielding. The Department has demonstrated the value of flexibility in funding through the Defense Innovation Unit's fielding line, delivering capability to meet Service and Combatant Command priorities. DoW also

must endeavor to make decisions faster and communicate more clearly to ensure that indecision fatigue does not set in with aspiring vendors.

International Research Cooperation

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

If confirmed, I would seek to increase opportunities for industry to provide commercial solutions to the hardest defense problems. I would also engage regularly with our allies and partners, and their defense S&T enterprises, through forums such as the NATO Science and Technology Organization and the Five Eyes Technical Cooperation Program to leverage their technological capabilities to complement and protect the Department's strategic investments in technology maturation and capability delivery. The OUSW(R&E) investment strategy should focus on reestablishing deterrence and maintaining strategic advantage while preventing critical technologies from falling into the hands of global adversaries or competitors.

68. What do you perceive to be the most significant obstacles to effective international research and development cooperation, and, if confirmed, how would you address those obstacles?

From my perspective, the most significant obstacles to effective international research and development cooperation are conflicting priorities and misaligned budget planning processes. If confirmed, I would increase awareness across the DoW Components' international science and technology activities to promote transparency and accountability across the Department as well as ensuring the DoW R&E Enterprise pursues international collaboration, both government-to-government and with industry, in support of the Secretary's strategic priorities and to deliver capabilities at the speed of relevance. I intend to work with the DoW Components to identify funding that will be used specifically to pursue international cooperation with allies and partners that bring an equitable and mutually beneficial investment to collaborative activities.

69. How would increased international technology cooperation and procurement of foreign goods and services affect our domestic defense industrial base, in your opinion?

If confirmed, I would work with the DoW Components to consider acquisition and sustainment pathways early in the co-development process. This will allow the U.S. defense industrial base to leverage the industrial bases of trusted allies and partners to meet DoW procurement and production demands, potentially leading to a more competitive, resilient, and innovative ecosystem.

70. What best practices should govern Departmental monitoring and assessment of the research capabilities of our global partners and competitors, and of the global commercial sector?

While other parts of DoW and the U.S. national security community writ large provide critical functions of monitoring and assessing the research capabilities of global partners and competitors, if confirmed, I would also leverage the opportunities and insights offered by regionally embedded personnel exchanges and in-country stationed DoW technical experts, as well as seeking regular engagement with our allies' defense S&T researchers. These individuals provide valuable insights into allied and partner capabilities and investments, which in turn can inform best practices for pursuing collaborative activities with those countries. Another example is expanding joint experimentations and demonstrations. If confirmed, I will encourage more opportunities to include allied and partner participation in DoW experimentations and demonstrations to assess and evaluate their capabilities.

71. What are your views on the current efforts for AUKUS Pillar II, and do you have recommendations for how cooperation could be improved through that forum?

I understand that the AUKUS agreement, including Pillar II, is undergoing a policy review led by the OUSW(Policy). I look forward to reviewing their analysis of this international agreement.

72. In your view, are there opportunities to improve coordination among the broader range of international armaments cooperation activities, including improving coordination between R&E, A&S, Policy, the military service international organizations, and the geographic combatant commands?

While other parts of DoW and the U.S. national security community writ large provide critical functions of monitoring and assessing the research capabilities of global partners and competitors, if confirmed, I would also leverage the opportunities and insights offered by regionally embedded personnel exchanges and in-country stationed DoW technical experts. These individuals provide valuable insights into allied and partner capabilities and investments, which in turn can inform best practices for pursuing collaborative activities with those countries. Another example is expanding joint experimentations and demonstrations. If confirmed, I will encourage more opportunities to include allied and partner participation in DoW experimentations and demonstrations to assess and evaluate their capabilities. I would work with the DoW Components to consider acquisition and sustainment pathways early in the co-development process. This will allow the U.S. defense industrial base to leverage the industrial bases of trusted allies and partners to meet DoW procurement and production demands, potentially leading to a more competitive, resilient, and innovative ecosystem.

Small Business Issues

73. If confirmed, how would you work to ensure that the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) program is an integral part of DOD modernization strategies and activities?

The DoW invests over \$3 billion each fiscal year through the SBIR/STTR programs in innovative technologies to meet critical needs of the warfighter and grow and modernize the defense industrial base while ensuring responsible stewardship of taxpayer funds. My hypersonic wind tunnel research group regularly provides test capabilities for small businesses executing SBIR and STTR contracts, so I have seen first-hand how SBIR/STTR is a vital part of the Department's modernization efforts. If confirmed, I am committed to working with Congress, the Service Acquisition Executives, and all other parties of interest to ensure that the SBIR/STTR programs are fulfilling their missions of developing and delivering innovation, consistent with the Department's modernization strategies and Critical Technology Areas.

74. If confirmed, how might you modify the SBIR/STTR program to improve the transition of S&T capabilities into acquisition programs?

Many game-changing technologies adopted by DoW came from small innovative businesses. The SBIR and STTR programs are important tools to support the small business ecosystem and identify promising technologies developed by small businesses. If confirmed, I look forward to reviewing these programs and driving efficiencies. I will work closely with Congress and with the Under Secretary of War for Acquisition and Sustainment (USW(A&S)), to make appropriate improvements to the SBIR program.

75. If confirmed, how might you modify the SBIR/STTR program to improve its ability to attract non-traditional defense contractors, such as small startup companies, as participants?

In my work as a university professor, I have partnered with several small and startup companies on SBIR/STTR contracts. Small business concerns, including nontraditional defense contractors, may require additional assistance to understand Government-specific processes and procedures such as proposal submission requirements, pre-award activities, cybersecurity rules and practices, and foreign disclosure requirements. If confirmed, I would work with the USW(A&S) and the Director of the DoW Office of Small Business Programs to review ways to increase opportunities to educate small business concerns, ensuring the Department is making a concentrated effort to educate small businesses on how to do business with DoW.

- 76. The SBIR/STTR program is executed slightly differently across the military services and DOD agencies. Are there benefits in how each organization executes the SBIR/STTR program to meet their specific technology needs? Could you provide some examples of how that variation benefits the Department's program as a whole?**

In my present work as an academic researcher, I have been fortunate to engage with the SBIR/STTR program as executed by several different Military Services and Defense agencies. If confirmed, I look forward to reviewing how the Department executes the SBIR/STTR programs across the Military Services and Defense Agencies. I will assess if there are benefits of how each organization executes the programs to meet their specific technology needs.

- 77. If confirmed, what steps would you take to improve DOD's consideration of intellectual property rights as an incentive for small businesses to engage with the Department?**

Many game-changing technologies adopted by DoW came from small innovative businesses. The SBIR and STTR programs are important tools to support the small business ecosystem. If confirmed, I look forward to reviewing these programs and working with my counterpart within the Office of the USW(A&S), on ways to improve how the Department incentivizes small business to engage with intellectual property rights.

- 78. What emphasis would you place, if confirmed, on participation by the acquisition community in setting research priorities for the SBIR/STTR program and in incorporating new technologies and methods into existing programs of record?**

Many game-changing technologies adopted by DoW came from small innovative businesses. The SBIR/STTR program is an important tool to support the small business ecosystem. If confirmed, I look forward to reviewing these programs and working with my counterpart within the Office of the USW(A&S), on ways to improve how the Department incentivizes small business to engage with intellectual property rights.

- 79. Based on your experience, what do you see as the specific benefits of the STTR program that distinguish it from the SBIR program?**

The SBIR and STTR programs are important tools to support the small business ecosystem with related but different areas of focus. The STTR program facilitates collaboration between small businesses and research institutions. The STTR requirement to partner with a research institution, often a university lab or research group, leads to mutually beneficial engagement, providing small businesses executing

STTR contracts with key advantages in recruiting, and a potential on-ramp to integrate insights and discoveries originating in academia. The research institution or academic partner likewise benefits from access to technologies originating within the highly creative small business ecosystem, which research institutions are well positioned to leverage in new and innovative ways. From my experience leading an aerospace research laboratory in the academic setting and the opportunity to perform pilot studies with new optical and surface sensor types, has allowed my students to make measurements that were previously impossible for us to do. If confirmed, I look forward to learning more about the impact of the STTR program and its benefits as compared to the SBIR program.

80. Based on your experience, are there other ways that you think DOD could be leveraging the SBIR/STTR program to enhance its mission?

If confirmed, I will work with the Defense SBIR/STTR Program Office to look into ways we can leverage the programs in order to support scientific excellence and technological innovation while also building a strong national economy. One specific example would be working to ensure that there are regular on-ramps for emerging good ideas, which is a particular concern for small businesses.

Defense Laboratories

81. What is your overall assessment of the technical capabilities and quality of Defense laboratories relative to their peers at the Department of Energy, and in Federally Funded Research and Development Centers (FFRDCs), industry, and academia—both foreign and domestic?

Defense laboratories and FFRDCs can play a critical role in national security by conducting specialized research and developing technologies not easily replicable elsewhere. Comparing them to other sectors, including the foreign sector, requires careful consideration of their distinct missions, strengths, and limitations. In my personal experience the defense laboratories have many strengths, and if confirmed I look forward to finding ways to build on their existing strengths and address any identified weaknesses.

82. What do you believe to be the most effective management and human resources approaches for personnel at these defense laboratory facilities?

An innovative and empowered workforce requires a flexible and responsive human resources system. My understanding is that the Department's Science and Technology Reinvention Laboratory (STRL) Personnel Demonstration Program (Lab Demo), managed by the OUSW(R&E), may meet this need. The OUSW(R&E)

collaborates with the STRLs to leverage congressional workforce authorities and to develop new personnel flexibilities to enable them to recruit, retain and cultivate a quality and optimized Department laboratory workforce.

83. If confirmed, would you support increased delegation of operating authority to lab directors? Please explain your answer.

If confirmed, I look forward to learning more about the value of increased delegation of operating authority to lab directors. If confirmed, I would work with the Military Services to ensure that the authority is managed at the most appropriate level.

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

If confirmed, I would seek to review the defense laboratories and identify ways to improve quality, technical capability and mission performance across the enterprise, leveraging both my experience in the Defense laboratories and the broad perspective afforded the ASW(S&T).

Federally Funded Research and Development Centers (FFRDCs) and University Affiliated Research Centers (UARCs)

85. In your opinion, what role do the FFRDCs play in the defense research ecosystem? How would you characterize the value of such organizations to DOD?

FFRDCs can play a critical role in national security by conducting specialized research and developing technologies not easily replicable elsewhere.

86. If confirmed, what suggestions would you make to better utilize FFRDCs across the Department?

If confirmed, I will review the current policies and use of the FFRDCs to explore how the Department might more effectively and efficiently use the FFRDCs.

87. In your opinion, how do the UARCs differ in role and purpose from FFRDCs, defense labs, and defense contract research organizations?

UARCs are university organizations that maintain essential research, development, and engineering “core” capabilities of particular importance to DoW. Through UARCs, the Department has assured access to academic researchers who have significant expertise and experience in a particular defense related competency (e.g., nanotechnology, electronic warfare, hypersonics). In contrast, FFRDCs, defense labs and contract research organizations cannot afford to have concentrated expertise in

every particular competency relevant to the Department and cannot serve as the sole preservation of specialized research capability for DoW.

- 88. In your opinion looking across the full landscape of current UARCs, do you see any major technical discipline or research capability gaps that are not being currently addressed and would therefore benefit from a dedicated UARC? Are there any UARCs that in your opinion have outlived their useful purpose?**

I understand that UARCs are assessed every five years for efficacy and continued relevance, which enables the Department to identify outdated technical disciplines and where there may be capability gaps. If confirmed, I look forward to ensuring we have a robust, excellence-focused, and future-forward UARC ecosystem.

- 89. How do the UARCs help with STEM and workforce development that supports DOD?**

My understanding is that, as is the intent for all Department-funded university research, UARCs are training students and postdoctoral scholars in fields of direct and critical interest to the DoW.

- 90. If confirmed, what suggestions would you make to better utilize UARCs across the Department?**

If confirmed, I would seek to review UARCs and identify ways to improve quality, technical capability and mission performance across the enterprise.

Workforce Issues

- 91. What is your perception of the workforce challenges confronting the DoD research enterprise?**

If confirmed, in support of the USW(R&E), I would want to fully assess the capabilities of the current workforce and contractor base. Regardless, in order to address emerging challenges, we need to continuously enhance this expertise. The OUSW(R&E) leads a number of initiatives to upskill the science and engineering workforce, and as a university professor I have been privileged to work on the front line of these and related efforts. These efforts focus on equipping individuals with the necessary skills to perform critical acquisition tasks, such as systems engineering, digital engineering, production, quality assurance, manufacturing, information technology, agile software development, and testing. It is also important that we enable new contractors to compete for DoW business so that we have a more robust ecosystem.

- 92. What is your understanding of how the personnel authorities applicable to the Office of the USD(R&E) compare to the human resources flexibilities available**

to the DARPA and the Defense laboratories? Should these flexibilities be expanded to apply also to the Office of the USD(R&E) and other research and engineering components of the DOD? Please explain your answer.

If confirmed, I look forward to assessing existing and potentially new hiring and retention authorities.

93. With a view to improving productivity, performance, and mission accomplishment, how would you work with the personnel policy and management communities in the Office of the Secretary of Defense and the Military Departments to enhance the human resources flexibilities available to DOD labs, test ranges, and other research and engineering components of the DOD?

If confirmed, I will coordinate with Under Secretary Michael, the OUSW(R&E) components, and the Military Departments to assess their needs to continue supporting their human capital requirements and improving their critical skills to ensure that critical technologies are rapidly fielded.

94. How would you work with DOW labs, test range, and other research and engineering components of DOW to maximize utilization of human resources flexibilities currently in place or newly authorized?

My understanding is that the USW(R&E) is already working very closely with the OUSW(P&R) and the Military Departments on human resource flexibilities for the defense labs, test ranges, and other R&E components of the DoW. Further my understanding is that the USW(R&E) is responsible for the execution of the Lab Demo program that offers over 50 flexibilities to attract, hire, retain, develop, and shape the technical workforce needed at the labs now and into the future. If confirmed, I would ensure that we continue to innovate the Lab Demo program which is executed within the OASW(S&T) and that we will maintain strong connections with the OUSW(P&R) and continue to learn from best practices across the DoW's alternative personnel systems.

95. What is your assessment of the diversity of the workforce comprising the research and engineering organizations of the Department of Defense?

The Department is undergoing an employment optimization effort to rebalance the workforce. From my understanding, this is an ongoing process which will take time to work through. If confirmed, I will work with the USW(R&E) to ensure the Department continues recruiting and retaining the best talent within the Department.

96. How do you think improvements in workforce diversity would improve the productivity, performance, and mission accomplishment of such organizations? Please explain your answer.

Recruiting and retaining top scientists and engineers is a priority for the Department and our research efforts. If confirmed, I look forward to learning more about ways to increase the recruiting of key technical positions across the research enterprise.

97. What steps, if any, would you take, if confirmed, to increase diversity in the research and engineering organizations of the Department of Defense?

Recruiting and retaining top scientists and engineers is a priority for the Department and our research efforts. If confirmed, I look forward to learning more about ways to increase the recruiting of key technical positions across the research enterprise.

98. Some research and engineering organizations, including DARPA and DIU, have different challenges in increasing diversity due to their need for more experienced, mid-career talent. In your view, are their meaningful steps these organizations can and should take to improve diversity notwithstanding?

If confirmed, I look forward to learning more about DARPA's and DIU's program management and the challenges they face.

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

99. Do you agree with the premise that the Department of Defense specifically, and the nation as a whole, are facing a crisis in STEM education?

The Department must be able to attract top talent not only literate in the latest technologies but also capable of learning and adapting to future technological developments. It is critical that the Department's R&D work happens at the speed of relevance. However, as new technologies develop and mature faster than ever before, it is becoming difficult to maintain a workforce and an overall organization that can keep pace. Having a workforce that can rapidly learn and integrate new methods, technologies, and strategies will allow the Department to absorb and capitalize on new technologies rather than to be left behind.

100. In your view, how have deficiencies in STEM education affected the Department's ability to execute its missions?

As I see every day as an aerospace engineering professor in my laboratory and classroom, America's technological edge depends on our ability to cultivate and retain the world's best scientists, engineers, and technologists. If confirmed, I will work to support STEM education opportunities like the ones I received at Lakeshore Public Schools back in Stevensville, Michigan, empower early-career researchers, and create new pathways for talent to enter the defense innovation ecosystem. We must inspire the next generation to serve—not only in uniform, but also in the laboratories and industries that power our defense enterprise.

101. What role do you think the Department should play in supporting STEM education writ large?

If confirmed, I look forward to learning more broadly about the role that the Department plays in STEM education, which I have experienced on the ground through my family's participation in Department-supported STEM education initiatives. Clearly, the Department relies on talented scientists and engineers in the public and private sectors to carry out its mission.

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

One key role that the Department can play is in providing time for military service members who have shown aptitude in research and innovation to pursue advanced research degrees. I have personally advised a dozen such active-duty students through the Purdue Military Research Institute, which has provided opportunities for these young officers to pursue hands-on, cutting edge hypersonics research. If confirmed, I look forward to learning more about the role that the Department plays in STEM education. We should seek opportunities, as appropriate, to support service members.

103. What role should the Department play in supporting STEM education opportunities for dependents of service members?

If confirmed, I look forward to learning more about the role that the Department plays in STEM education. We should seek opportunities, as appropriate, to support military dependents. Clearly, the Department relies on talented scientists and engineers in the public and private sectors to carry out its mission.

104. What role should the Department play in other K-12 STEM educational activities?

As I see every day as an aerospace engineering professor in my laboratory and classroom, America's technological edge depends on our ability to cultivate and retain the world's best scientists, engineers, and technologists. If confirmed, I will work to support STEM education opportunities like the ones I received at Lakeshore Public Schools back in Stevensville, Michigan, empower early-career researchers, and create new pathways for talent to enter the defense innovation ecosystem. We must inspire the next generation to serve—not only in uniform, but also in the laboratories and industries that power our defense enterprise. If confirmed, I look forward to learning more about STEM education opportunities outside of the Department.

105. What limitations exist that might hinder longitudinal data collection related to K-12 STEM programs?

If confirmed, I look forward to learning more about the role that the Department plays in STEM education. I will review potential limitations that hinder longitudinal data collection.

Manufacturing

106. What role should DOD play in investing in manufacturing innovation and ensuring that the resultant innovations are adopted into defense industry and the organic industrial base?

In my view, the Department should prioritize strategic investments in manufacturing innovation, domestic infrastructure, and workforce development, coupled with clear articulation of defense-specific requirements and performance metrics. I believe we should also leverage DoW-led public-private partnerships, including the Manufacturing Innovation Institutes, to connect our research enterprise with industry and academia to rapidly scale breakthrough technologies while maintaining mission-critical standards.

107. What is your assessment of the performance and impacts of the DOD Manufacturing Technology program, including the Manufacturing Institutes? How are these institutes linked with the research and testing organizations in the Department?

From what I have learned, ManTech works with DoW's Manufacturing Innovation Institutes, industry, and academia to support workforce development in the sectors critical to our defense. If confirmed, I will preserve and deepen these nationwide engagements and take a tailored, regional approach to workforce development that fully considers the varying needs of different sorts of manufacturers across the country.

108. In your view, should the DOD be doing more to foster and grow biomanufacturing capability to meet critical defense needs? If so, what?

In my view, the Department should prioritize strategic investments in domestic infrastructure and workforce development, coupled with clear articulation of defense-specific requirements and performance metrics. Fostering collaborations between academia, industry, and government labs, while incentivizing dual use biomanufacturing applications and streamlining regulatory pathways and acquisition processes for biomanufactured products, will all be essential to meeting the needs of the Department. I think we should leverage proven models, like Tri-Service Biotechnology for Resilient Supply Chains (T-BRSC) and the Distributed Bioindustrial Manufacturing Program (DBIMP), with integrated funding pathways

spanning budget area 6.2 through 6.4 activities and cross-functional program structures, to rapidly mature biomanufacturing to meet Defense needs. I believe we should also leverage DoW-led public-private partnerships, including the Manufacturing Innovation Institutes, to connect our research enterprise with industry and academia to rapidly scale breakthrough technologies while maintaining mission-critical standards.

Social Science and Management Research

109. In your view, how would increases in DOD-funded research in the social, information, and management sciences benefit defense missions?

If confirmed, I look forward to learning more about potential capabilities developed in social information and management sciences research. I will work to ensure that our priorities are aligned with the Administration's policies and that our resources have a clear strategy against which to operate.

110. What is your opinion of the MINERVA program as a means to connect social science research more directly to defense research and engineering needs?

If confirmed, I look forward to learning more about the MINERVA program. I will work to ensure that our priorities are aligned with the Administration's policies and that our resources have a clear strategy against which to operate.

111. How could the Department strengthen interdisciplinary and multidisciplinary research to better integrate social science research into broader defense research and engineering needs?

If confirmed, I look forward to learning more about the Department's work to strengthen interdisciplinary and multidisciplinary research into broader defense research and engineering needs.

112. Do you have specific ideas for enabling engagement between the DOD science and technology community and outside academic experts in areas such as business, management, and public administration, to perform research, participate in personnel exchange programs, and provide technical expertise to support the Department's efforts to improve its management and business practices?

I will work to ensure a balanced research portfolio to include looking for opportunities for collaboration with academia and industry in technology transition and commercialization efforts.

Sexual Harassment

In responding to the 2018 DOD Civilian Employee Workplace and Gender

Relations survey, 17.7 percent of female and 5.8 percent of male DOD employees indicated that they had experienced sexual harassment and/or gender discrimination by “someone at work” in the 12 months prior to completing the survey.

113. What is your assessment of the current climate regarding sexual harassment, gender discrimination, and other harassment in the Office of the ASD(S&T)?

I will state categorically that sexual assault and harassment have no place in our country’s military and War Department. If confirmed, I commit to upholding all appropriate standards of conduct in the ASW(S&T) office and will carefully review the office climate as it relates to potential harassment.

114. If confirmed, what actions would you take were you to receive or become aware of a complaint of sexual harassment, discrimination, or other harassment from an employee of the Office of the ASW(S&T) or an employee of an organization over which the ASW(S&T) exercises authority, direction, and control?

I will state categorically that sexual assault and harassment have no place in our country’s military and War Department. If confirmed, I commit to upholding all appropriate standards of conduct in the ASW(S&T) office.

Congressional Oversight

In order to exercise legislative and oversight responsibilities, it is important that this committee, its subcommittees, and other appropriate committees of Congress receive timely testimony, briefings, reports, records—including documents and electronic communications, and other information from the executive branch.

115. Do you agree, without qualification, if confirmed, and on request, to appear and testify before this committee, its subcommittees, and other appropriate committees of Congress? Please answer with a simple yes or no.

Yes.

116. Do you agree, without qualification, if confirmed, to provide this committee, its subcommittees, other appropriate committees of Congress, and their respective staffs such witnesses and briefers, briefings, reports, records—including documents and electronic communications, and other information, as may be requested of you, and to do so in a timely manner? Please answer with a simple yes or no.

Yes.

117. Do you agree, without qualification, if confirmed, to consult with this committee, its subcommittees, other appropriate committees of Congress, and their respective staffs, regarding your basis for any delay or denial in providing testimony, briefings, reports, records—including documents and electronic communications, and other information requested of you? Please answer with a simple yes or no.

Yes.

118. Do you agree, without qualification, if confirmed, to keep this committee, its subcommittees, other appropriate committees of Congress, and their respective staffs apprised of new information that materially impacts the accuracy of testimony, briefings, reports, records—including documents and electronic communications, and other information you or your organization previously provided? Please answer with a simple yes or no.

Yes.

119. Do you agree, without qualification, if confirmed, and on request, to provide this committee and its subcommittees with records and other information within their oversight jurisdiction, even absent a formal Committee request? Please answer with a simple yes or no.

Yes.

120. Do you agree, without qualification, if confirmed, to respond timely to letters to, and/or inquiries and other requests of you or your organization from individual Senators who are members of this committee? Please answer with a simple yes or no.

Yes.

121. Do you agree, without qualification, if confirmed, to ensure that you and other members of your organization protect from retaliation any military member, federal employee, or contractor employee who testifies before, or communicates with this committee, its subcommittees, and any other appropriate committee of Congress? Please answer with a simple yes or no.

Yes.