

**Advance Questions for Dr. Ronald M. Sega**  
**Nominee for the Position of Director of Defense Research and Engineering**

**1. Defense Reforms**

**More than a decade has passed since the enactment of the Goldwater-Nichols Department of Defense Reorganization Act of 1986 and the Special Operations reforms.**

**A. Do you support full implementation of these defense reforms?**

If confirmed, I will fully support the intent of the reforms and advocate policies that will facilitate accomplishment of joint operations, streamline acquisition management and oversight, and enhance the Department's ability to respond to our 21<sup>st</sup> century national security challenges.

**B. What is your view of the extent to which these defense reforms have been implemented?**

I think the Department has done a creditable job in implementing defense reforms. However, without periodic Department policy reviews, these reforms can lose their effectiveness and, if confirmed, I will conduct such a review in my area to ensure we are in keeping with today's environment.

**C. What do you consider to be the most important aspects of these defense reforms?**

I agree with Mr. Aldridge that the most important aspects of the Goldwater-Nichols Department of Defense Reorganization Act, is strengthening civilian control; improving military advice; placing a clear responsibility on the combatant commanders for the accomplishment of their missions; providing for more efficient use of defense resources; and enhancing the effectiveness of military operations and improving the management and administration of the Department of Defense.

**The goals of the Congress in enacting these defense reforms, as reflected in section 3 of the Goldwater-Nichols Department of Defense Reorganization Act, can be summarized as strengthening civilian control; improving military advice; placing clear responsibility on the combatant commanders for the accomplishment of their missions; ensuring the authority of the combatant commanders is commensurate with their responsibility; increasing attention to the formulation of strategy and to contingency planning; providing for more efficient use of defense resources; and enhancing the effectiveness of military operations and improving the management and administration of the Department of Defense.**

**D. Do you agree with these goals?**

Yes, I agree with the goals.

**Recently, there have been articles which indicate an interest within the Department of Defense in modifying Goldwater-Nichols in light of the changing environment and**

**possible revisions to the national strategy.**

**E. Do you anticipate that legislative proposals to amend Goldwater-Nichols may be appropriate?**

If confirmed as Director of Defense Research and Engineering (DDR&E), I will work with the Under Secretary of Defense (Acquisition, Technology and Logistics) and other senior DoD leaders to review the extent to which the reforms have been implemented and the extent to which they have achieved their stated goals. As Secretary Rumsfeld has noted, we would consult with Congress on any changes that might be appropriate.

**F. If so, what areas do you believe it might be appropriate to address in these proposals?**

It would be premature to offer any thoughts on the question at this time.

**2. Duties**

**A. What is your understanding of the duties and functions of the Director of Defense Research and Engineering?**

If confirmed, I understand my duties and functions to include those stated in DoD 5134.3 issued on August 31, 1994, to be “the principal staff assistant and advisor to the Under Secretary of Defense for Acquisition and Technology (USD(AT&L)) for DoD scientific and technical matters, basic and applied research, and advanced technology development.” I would report directly to the USD(AT&L), with the responsibilities like a chief technology officer for the Department to focus on developing capabilities for the warfighter. I would be working with the Director, Ballistic Missile Defense Office (BMDO) and the Assistant to the Secretary of Defense for Nuclear, Chemical, & Biological (ATSD(NCB)) which report to the USD(AT&L) as well as organizations outside of USD(AT&L), such as Assistant Secretary of Defense for Command, Control, Communication and Intelligence (ASD(C3I)), to provide support in matters related to technology. I also understand that, if confirmed, the results of ongoing reviews may require adjustments in the DDR&E responsibilities.

**B. What background and experience do you possess that you believe qualifies you to perform these duties?**

If confirmed, I will bring a background and experience in research, technology and program management, military and civil air and space operations, and strategy planning from roles as a Professor, Laboratory Technical Director, Pilot, Dean of a College of Engineering and Applied science, Astronaut and Military Officer to the position of the DDR&E. My background includes basic and applied research, and advanced technology development, working with the Army, Navy, Air Force, Defense Advanced Research Projects Agency (DARPA), Defense Nuclear Agency (DNA), and industry. Management and leadership experience is found in several organizations with activities spanning technical system integration to setting strategic goals. I have also been an operator of systems from line aircraft and spacecraft to experimental vehicles.

Additional details of my experience with the University of Colorado, University of Houston, Frank J. Seiler Research Laboratory, NASA, U.S. Air Force and the U.S. Air Force Reserves are in the Biography provided to the Senate Armed Services Committee.

**C. Do you believe that there are actions you need to take to enhance your ability to perform the duties of the Director of Defense Research and Engineering?**

If confirmed, I need to review and refine the strategic direction of the Department's S&T plan to ensure the Department seeks innovative solutions. To do this, I would develop a strategic plan by first reviewing warfighter needs, and then assessing the capability of the Department's S&T plan to meet these needs. From there, I would have to align the technical programs to best meet the areas not being addressed. Finally, I would have to set priorities with clear goals and objectives to maximize the output of the S&T program. I plan to listen to subject matter experts, people in the field, warfighters, and consistently communicate with the Military Departments, Joint Staff, and Congress. Of course, quality people to carry out the mission are our most important asset and I will, if confirmed, work to sustain and hire good people to build a great team.

**D. Assuming you are confirmed, what duties and functions do you expect that the Secretary of Defense will assign to you? Unlike some of your predecessors, do you expect to have regular meetings with the Secretary of Defense on issues such the level of S&T funding, missile defense technology, defense industrial base, and export controls?**

In my meeting with Secretary Rumsfeld, it was clear that he supported a strong S&T program. If confirmed, I understand that I would normally accompany or represent the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)), Mr. Pete Aldridge, in meetings with the Secretary on matters relating to technology.

**E. If confirmed, how will you work with the following:**

**The Under Secretaries of Defense**

If confirmed, one of the Under Secretaries of Defense, Mr. Aldridge, would be my reporting official, and I would support him to the best of my ability. With respect to the three remaining Under Secretaries of Defense, I will work with Mr. Aldridge to gain their support for all S&T initiatives and policies.

**The Assistant Secretaries of Defense**

If confirmed, I will work to gain their support for all S&T initiatives and policies Mr. Aldridge and I are seeking to implement through personal contact and routine staffing coordination.

**The Deputy Under Secretary of Defense for Science and Technology**

If confirmed, the Deputy Under Secretary of Defense for Science and Technology will

work for me and be my principal deputy.

### **The Service and Agency officials responsible for science and technology funding and program management**

If confirmed, I will work most closely with these high level DoD officials. I am aware of a formal group called the Defense Science and Technology Advisory Group (DSTAG) that meets regularly. If confirmed, I intend to continue to hold DSTAG meetings on a regular basis.

### **The Intelligence Community**

If confirmed, I intend to work closely with the Assistant Secretary of Defense for C3I concerning the role the DoD S&T program can play in supporting the intelligence and space community, as well as to gain insight and leverage other intelligence agency technology development programs.

### **The Joint Chiefs of Staff**

The Joint Chiefs of Staff (JCS) represents the warfighting community, which is the customer of the Department's S&T program. If confirmed, I will foster close formal and informal communication with the JCS to understand warfighter requirements and priorities. For example, if confirmed, I would work with the Deputy Director for Resources and Requirements, Joint Staff, (J-8) as a member of the Defense Science and Technology Advisory Group (DSTAG).

### **The regional combatant CINCs**

If confirmed, I will strive to understand the CINC's requirements both formally, through interface with the Joint Chiefs of Staff, and informally, through the CINC's S&T representatives.

## **3. Major Challenges and Problems**

### **A. In your view, what are the major challenges that will confront the Director of Defense Research and Engineering?**

If confirmed, I see that there are many challenges and these challenges will run the full spectrum of my responsibilities. These challenges are consistent with challenges which drive the goals of the USD(AT&L). These USD(AT&L) goals are:

- 1) Achieve Credibility and Efficiency in the Acquisition and Logistics Support Process
- 2) Revitalize the Quality and Morale of the Acquisition Workforce
- 3) Improve the Health of the Defense Industrial Base
- 4) Rationalize the Weapon Systems and Infrastructure With the New Defense Strategy and

- 5) Initiate High Leverage Technologies to Create the Weapon Systems and Strategies of the Future.

I believe that the challenges facing the DDR&E are largely the same. The first is to achieve credibility and efficiency of the technology development process, leading to efficient technology transition. The second is to retain and recruit high quality scientists and engineers. Third is continue to foster partnerships, both within and outside of government. Finally, consistent with Mr. Aldridge's fifth goal, the DDR&E will be firmly involved in developing high leverage technologies to create weapons systems of the future. To accomplish this last goal, if confirmed, I will need to address budget stability for DoD science and technology, and maintain DARPA at the leading edge of technology.

**B. Assuming you are confirmed, what plans do you have for addressing these challenges?**

If confirmed, I intend to develop a plan to address the challenges by setting specific S&T related goals and objectives responding to each USD(AT&L) goal as briefly outlined in the previous answer.

**C. What do you consider to be the most serious problems in the performance of the functions of the Director of Defense Research and Engineering?**

I consider people, budget, and technical direction to be the most serious problems to address in performing the functions of the DDR&E. Additionally, I believe it is very important to align the technology program with the strategic goals of this Department, the goals of the USD(AT&L), and if confirmed, I would intend to establish goals for DDR&E. The DDR&E challenges are largely the same as the USD(AT&L), so the goals should be very consistent.

**D. If confirmed, what management actions and time lines would you establish to address these problems?**

Similar to my answer above, if confirmed, I would base a management action on objectives and metrics derived from the USD(AT&L) goals. These objectives would also reflect the Department's S&T challenges. If confirmed, I will begin working on these upon my assumption of duties. Without fully understanding the magnitude of the task, it is too early to set any time lines.

**4. Priorities**

**A. If confirmed, what broad priorities would you establish in terms of issues which must be addressed by the Director of Defense Research and Engineering?**

If confirmed, the broad priorities areas I would establish as DDR&E are budget, workforce, technology transition and partnerships. To support an innovative, capabilities driven science and technology program, it is critical to have funding stability, and sufficient resources, to allow the

Department to develop technologically superior weapons. Stability is especially important so researchers can work on problems over a period of time, instead of having to start and stop projects. Additionally, the Department needs to continue to emphasize recruiting and retaining a quality workforce to address the technology challenges confronting the Department of Defense. Along with budget and people, there is an added priority to ensure technology is ready to be delivered to enhance operational capability of our military. Finally, if confirmed, I intend to strengthen our partnerships with other government agencies (NASA, Department of Energy, Department of Commerce, etc), industry, and universities, as well as with other nations. This is a priority because the DoD should leverage what is available, and then develop the technology to provide our military a superior capability. I believe that there already is an emphasis on each of these areas within the Department and it should be maintained

## **5. Investment in Science and Technology**

**Although the S&T budget has steadily increased over the past several years, it is at the lowest share of Total Obligation Authority (TOA) in nearly a decade.**

### **A. Do you think that this level of funding is adequate given current Departmental priorities?**

I believe that establishing the level of Department-wide S&T investment must be set in the overall context of Department priorities. It is my understanding that Secretary Rumsfeld has established a goal to increase the overall level of the investment to 3.0% of the overall DoD Total Obligation Authority. Mr. Aldridge has also publicly supported this goal. While the 3.0% figure is a goal, this priority must be carefully weighed against other Department needs for maintaining and equipping the force. If confirmed, I see my job as one that must continue to advocate the value of S&T investment to the Department as a whole, and to demonstrate the value of technology.

**Secretary Rumsfeld stated publicly in his June 28, 2001, testimony that the Department's investment goal for Science and Technology is 3% of the entire defense budget.**

### **B. Is this an adequate and realistic goal for Science and Technology, and, if you agree, when do you foresee that this goal will be achieved?**

I believe that the Secretary's goal is both adequate and realistic. Using the benchmark of high technology industry, the 3.0% figure seems to be about right to enable technology development. Mr. Aldridge has indicated that he supports the S&T investment getting to the 3.0% level as soon as possible, and wants to achieve this level as early as next year. I believe there is a real momentum within this administration to increase the priority of science and technology, and if confirmed, I will encourage it to continue.

### **C. If confirmed, would you recommend that the Services set a similar percent of the service budgets as a goal? If so, in what time frame would you recommend that this be achieved?**

If confirmed, I would not recommend setting specific percentage investment goals for individual Services. The stated Department-wide goal of increasing Defense-wide investment to 3.0% of the DoD Total Obligation Authority is overarching, and includes the total investment of the Services and Agencies, such as the Defense Advanced Research Projects Agency (DARPA), the Defense Threat Reduction Agency (DTRA) and others. The actual allocations of this investment should be one that best responds to meeting desired capabilities that result from on-going studies such as the Quadrennial Defense Review.

**D. Are there any S&T areas that you feel are currently underfunded by the Department?**

I don't know if there are specific S&T areas that are underfunded at present. If confirmed, one of my first tasks will be a detailed review of the S&T investment in specific areas to meet emerging threats and desired capabilities articulated in on-going studies. For instance, as mentioned previously, the on-going Quadrennial Defense Review should refine the capabilities the Department seeks to develop. Once these important studies are completed, the Department must review its current and planned S&T investment and determine which areas need more or less funding. The administration has articulated a goal of developing revolutionary or leap-ahead capabilities. The S&T program should respond to these desired capabilities. One of the key functions of the DDR&E is to work with the warfighters and present technology options for future capabilities. By iterating the technological possibility with the warfighters, I believe we will get a clearer definition of the adequacy of funding in specific areas.

**E. Will the funding levels in these areas affect our ability to meet the threats of the future?**

As the Department refines the desired capabilities of the future, the level of S&T investment will affect how the nation can meet future threats. There will be capabilities that can be developed more quickly, while other areas will require more fundamental scientific discovery. However, in general, those areas that are most important to the defense of the nation will get the highest investment priority.

**F. What are the weaknesses of the current Defense S&T strategic planning process? If confirmed, how would you work to ensure that these plans are utilized during the budget planning and programming process?**

I believe the S&T strategic planning process needs to be linked with the planning processes of the Department. I am aware of *The Joint Warfighting Science and Technology Plan*, which is a document updated annually to describe how the Department S&T program will deliver near-term capabilities to the warfighter. The warfighter and technology communities within the Department cooperatively develop this plan. This seems to be an example of an effective near-term process. If confirmed, I will review the total planning process, and will emphasize near-term and strategic planning throughout the S&T community.

**G. Are you satisfied with the level of communication and coordination among the technical, policy and warfighting communities in the formulation of the S&T budget planning, prioritization, and management process?**

It is too early to answer this question. Good communication and coordination is critical, and if confirmed, will be a high priority for me. This includes communication between the stakeholders in the Pentagon, as well as communication with other government agencies and Congress. Communication and coordination between the S&T and acquisition communities is also critical to enable effective technology transition. However, it is too early to answer the question regarding my satisfaction with the level of communication between stakeholders.

## **6. Coordination with S&T in Other Agencies**

**The Department of Defense currently executes approximately half of the total federal science and technology portfolio. Its S&T budget is remaining relatively flat, while those of other agencies, namely the National Institutes of Health, are greatly increasing. Additionally, many scientific advances made in programs managed by civilian agencies are increasingly applicable to military needs.**

**A. Do you feel the mechanisms of coordination between federal civilian agencies and DoD are adequate to ensure that the military can best leverage the advances of agencies such as NSF, NASA, and NIH?**

Coordination between federal agencies and DoD is extremely important, but I am unable at this time to assess whether the mechanisms are adequate. If confirmed, I will examine the existing mechanisms of coordination and recommend improvements, if warranted.

**B. Do you feel the mechanisms of coordination between federal civilian agencies and DoD are adequate to ensure that we avoid duplication and overlap and that we get the best results with limited resources?**

Coordination between federal agencies and DoD is extremely important, but I am unable at this time to assess whether the mechanisms are adequate. If confirmed, I will examine the existing mechanisms of coordination and recommend improvements, if warranted.

**C. If not, and assuming you are confirmed, how will you work with other federal agencies and the Office of Science and Technology Policy to improve this coordination?**

N/A

**D. With the increasing importance of the interdependency between the sciences what actions would you take, if confirmed, to ensure an appropriate balance among investments in the various scientific disciplines in order to achieve military objectives?**

If confirmed, one of my initial priorities is to review and refine the S&T strategic plan to influence and balance investments in various scientific areas. Some specific actions that I would explore include greater encouragement of multidisciplinary teams attacking problems or exploring opportunities in basic and applied research. I would seek advice from the National Academies, the

Defense Science Board, and other established groups to provide valuable input to the Department's scientific program.

## **7. Defense Laboratories and Test Facilities**

**Congress, the Defense Science Board, and other entities have expressed concern regarding the condition of defense laboratories and test facilities. Implementation of management and personnel reforms and the establishment of innovative cooperative technology development programs have been slow and limited.**

### **A. What is your opinion of the condition and size of the defense laboratory system?**

I am aware that the Department has conducted a number of internal studies regarding technical personnel and laboratory infrastructure, but I have not seen them. My work in the academic arena has given me first hand insight into the technical workforce problems we are facing as a nation in government, industry and university communities. The situation in the Department of Defense was outlined on July 12 by Mr. Aldridge who stated before the HASC, "Another non-technical challenge and important priority is maintaining a strong S&T workforce. The number of scientists and engineers we have is down 15,300 from the 1990 level of 43,800. This workforce is also aging with the average age of the laboratory technology at about 45 years and a significant portion of the workforce able to retire in the next three years. There have been numerous studies to look at these and related issues, and new efforts are now underway to address." If confirmed, the defense laboratory system will be given high priority during my tenure. For example, a separate office for laboratory oversight would be an option under DDR&E.

### **B. If confirmed, how will you work to ensure that the defense labs communicate and facilitate the needs of the acquisition and warfighting communities?**

I believe that the defense wide S&T planning and review process should be linked to the DoD strategic planning process involving the Commanders-in-Chief (CINC's), the Joint Staff, the Military Departments, and the S&T community. If confirmed, I intend to challenge my staff and the S&T executives to continually assess, update, and modernize our processes to achieve an active working environment with the acquisition and warfighting communities.

### **C. If confirmed, what new regulatory reforms dealing with personnel will you propose to ensure that the finest technical talent is resident at these facilities?**

If confirmed, I will assess the various personnel initiatives currently being worked in the Department and be open to innovative approaches. It is my understanding that the Under Secretary of Defense for Personnel and Readiness USD(P&R) and the USD(AT&L) are in the process of implementing provisions previously approved by Congress. If confirmed, I will strive to ensure that options for hiring highly skilled scientific and technical staff remain a Departmental priority. I will also review existing legislative proposals, and recommend options for additional reforms as appropriate.

## **8. Technology Transition**

**A number of programs have been established to try to speed the transition of technologies and other innovations from science and technology programs into the hands of warfighters.**

### **A. If confirmed, what new ideas will you propose to assist in technology transition efforts?**

I believe enhancing technology transition is one of the more important functions of the DDR&E. If confirmed, I will continue to push for efficient technology transition to rapidly provide new capabilities for the warfighter. For example, as an Air Force Reserve officer, I was involved with the TENCAP (Tactical Exploitation of National Capabilities) program, designed to bring capabilities of national intelligence systems to operational warfighters. In this role, I saw first-hand the value of transitioning previously unavailable technologies to the warfighter. I understand that there are existing DoD programs, such as the Advanced Concept Technology Demonstration (ACTD) Program that can provide technology quickly to the warfighter for validation, thus streamlining acquisition. I also believe that the establishment of a current year source of funds could provide a mechanism to speed transition of rapidly maturing technology to system capabilities for warfighter use. If confirmed, I would support an approach of continual involvement of the technology, acquisition, and warfighting communities to give the Department a more efficient technology transition process.

### **B. What is the role of the Office of Director of Defense Research and Engineering in facilitating communication between technical communities to speed technology transition?**

If confirmed, I believe my role will be as an active participant in establishing strong communication among the Military Services, Defense Agencies, academia, industry, and other government agencies to share best practices and build new initiatives and metrics to ensure mature technologies are ready for insertion into weapon systems.

## **9. Other Science and Technology Issues**

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

I believe that cooperative R&D programs have the potential to be very valuable. These cooperative programs can reduce duplication and improve interoperability. At the same time we would need to ensure that our National Security interests are protected and that these programs support competitiveness. If confirmed, I would support international programs meeting appropriate criteria.

### **B. What are the obstacles to more effective international cooperation and, if confirmed, how would you address those obstacles?**

While I understand the importance of effective international cooperation, this is an area I will, if confirmed, need to investigate further. Issues such as export control procedures and intellectual property rights are factors that will need to be understood and addressed.

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

I am not an expert in this area. From one perspective, international cooperation could assist our industrial base in the development of joint technical ventures and increase our suppliers' potential business base. If confirmed, I will explore this area with Government and industry leaders.

**D. What are the biggest challenges in R&D related to theater and national missile defense systems?**

The lead for the development of near-term missile defense systems is the Ballistic Missile Defense Organization (BMDO). For the long-term program, I understand that R&D efforts would be coordinated throughout the S&T community to provide technology options for future system designs. If confirmed, I will encourage innovative technology approaches to enable future capabilities to include missile defense.

**E. If confirmed, what role do you expect to play in addressing these challenges?**

DDR&E will play a support role to BMDO as required for the near-term missile defense programs. R&D challenges for the future missile defense systems include: discrimination, command and control, directed energy, propulsion, software, etc.

**F. If confirmed, how will you strengthen the ability of Service and Agency officials to oversee and adequately test these and other rapidly expanding and technically complex programs?**

I will begin by saying that, if confirmed, under the current organization of USD(AT&L), neither formal operational or developmental test and evaluation are under the responsibility of the DDR&E. However, with any technology demonstration, continual design test and evaluation should be part of the technology development process. If confirmed, I will strive to ensure the science and technology community is responsive to the formal test and evaluation communities, and explore appropriate organizational placement of test and evaluation as part of the overall system development process.

**The domestic defense industrial base, particularly the industrial research and development base, continues to be an issue of concern.**

**G. What is your vision of the future of the private sector defense R&D enterprise?**

I believe the Nation needs a strong private sector defense R&D enterprise. The past

decade has seen major changes in the defense industrial base caused by downsizing and consolidation, and, at the same time, the Department of Defense has downsized. I believe the Department needs to continue to treat the defense industrial sector as a partner in delivering capabilities for the warfighter. If confirmed, I will review the current government-industry cooperative arrangements and explore potential innovative arrangements to provide optimum future capabilities.

**H. If confirmed, how will your work to ensure that the private sector technology and research base is adequate to meet our national needs for technical innovation and engineering expertise in militarily critical technologies?**

I believe the issue of ensuring that the private sector technology and research base is adequate is a national level issue, and one that, if confirmed, will receive significant attention from my office. I also believe there is no simple solution to ensuring an adequate technology and research base. Sustained investment is important, and certainly industry operates to make a profit. If confirmed, I will strive to establish and maintain an information exchange with leaders of industry as one step toward addressing this enabler for future military capabilities.

**10. Congressional Oversight**

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

**A. Do you agree, if confirmed for this high position, to appear before this Committee and other appropriate committees of the Congress?**

Yes.

**B. Do you agree, if confirmed, to appear before this Committee, or designated members of this Committee, and provide information, subject to appropriate and necessary security protection, with respect to your responsibilities as the Director of Defense Research and Engineering?**

Yes.

**C. Do you agree to ensure that testimony, briefings and other communications of information are provided to this Committee and its staff and other appropriate Committees?**

Yes.