Advance Questions for J. Michael Gilmore
Nominee for Director of Operational Test and Evaluation, Department of Defense

Duties

What is your understanding of the duties and functions of the Director of Operational Test and Evaluation?

In my view, the principal responsibility of the Director of Operational Test and Evaluation is to ensure that the weapons and protective systems our men and women in the military services must depend on will work in combat. I believe every Director must regard that responsibility as a special trust they assume.

More specifically, the duties of the DOT&E are covered by statute. I understand that, if confirmed, I would serve as the principal advisor to the Secretary of Defense and Under Secretary of Defense for Acquisition, Technology, and Logistics for all operational test and evaluation within the Department. I would formulate and implement policy for operational test and evaluation and provide oversight of the operational testing of major defense programs, major automated information systems and other systems as I designate. I would be required to provide Congress an Annual Report summarizing operational test and evaluation activities that includes comments and recommendations on operational test and evaluation resources, facilities and funding. In addition to the Annual Report, I would provide Beyond Low Rate Initial Production Reports, Early Fielding Reports for systems that are urgently needed and deployed before completion of initial operational testing, Live Fire Reports, an Annual Report On Ballistic Missile Defense and respond to requests from Congress. My duties would include responsibility for prescribing policies and procedures for the conduct of live fire test and evaluation and for monitoring, reviewing, and reporting on all operational and live fire test and evaluation within the Department. I would also be responsible for coordinating joint operational testing. I would review and provide recommendations to the Secretary of Defense on all budgetary and financial matters relating to operational and live fire test and evaluation, including test facilities. In recent years, the authorities of the DOT&E have been expanded to allow the assessment of the Ballistic Missile Defense System, the testing of Information Assurance vulnerabilities, and oversight of Body Armor and other critical Force Protection equipment being provided to our deployed forces.

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

I have 24 years of experience working with and for defense industry, the Defense Department, and the Congressional Budget Office analyzing the key drivers of operational effectiveness and costs of defense programs. This experience, as well as my education and training in science and engineering, give me the requisite perspective and skills to provide Congress and the Secretary of Defense factual, accurate assessments of

the operational testing and evaluation of our weapons systems, as well as objective recommendations derived from those assessments. Furthermore, my experiences with the Defense Department's Cost and Analysis Improvement Group and the Congressional Budget Office have given me a strong appreciation of the value of independent, objective analysis and reporting.

Do you believe that there are actions you need to take to enhance your ability to perform the duties of the Director of Operational Test and Evaluation (DOT&E)? If so, what are they?

If confirmed, I would increase my familiarity with the capabilities and limitations of the test and evaluation infrastructure within the Department of Defense and with the many programs that DOT&E oversees. I would establish productive and cooperative relationships with the Undersecretary of Defense for Acquisition, Technology and Logistics, the new Director, Developmental Test and Evaluation, the new Director, Systems Engineering, the Director of Defense Research and Engineering, the Director, Cost Analysis and Program Evaluation, the Director, Test Resource Management Center, the Military Departments' Operational Test Agencies and the Service Acquisition Executives. I would visit test facilities and witness the conduct of operational testing and live-fire testing to increase my understanding of the complexities and difficulties inherent in conducting testing. I would work with the test community, the acquisition community, the Joint Staff, and the Combatant Commanders to help ensure effective and suitable weapons systems are provided as quickly as possible to the warfighter.

Assuming you are confirmed, what duties and functions do you expect that the Secretary of Defense will assign to you?

If confirmed, I expect Secretary Gates would assign me all of the duties, functions, and responsibilities currently mandated by law and specified in the Department's directives for the position of Director, Operational Test and Evaluation.

Major Challenges

In your view, what are the major challenges that will confront the DOT&E?

I believe there are at least three important challenges that the DOT&E currently faces. First, the office must continue to strengthen the relationships it has established with rapid fielding organizations. Strong relationships with these organizations will enable DOT&E to provide oversight of and advice on testing that helps---not hinders---the fulfillment of their objectives to provide immediate help to our Soldiers, Sailors, Marines, and Airmen in the field. Second, to implement the Weapons System Acquisition Reform Act of 2009, DOT&E must establish a productive relationship with the new Director, Developmental Test and Evaluation (D,DT&E) to assure that office is effective and robust. Third, DOT&E must help assure that adequate resources---both personnel and

modern infrastructure---are available to the testing community to support the goals of the Reform Act, including its provisions regarding organizational conflicts of interest.

If confirmed, what plans do you have for addressing these challenges?

If confirmed, I would review the results of the oversight that DOT&E has conducted of rapid fielding organizations and make adjustments to it, as necessary, in consultation with each organization's leadership. The extent to which DOT&E's oversight has improved each organization's ability to accurately and quickly characterize both the strengths and weaknesses of the capabilities they field will be key to determining any changes that may be needed. I would work with the D,DT&E to develop the practices that will institutionalize the Department's new policy for conducting integrated developmental and operational testing---that effort should provide a natural mechanism for ensuring that office is effective and robust. Finally, I would work with the Under Secretary for Acquisition, Technology and Logistics, the Under Secretary for Personnel and Readiness, the Director of Developmental Test and Evaluation, the Director of the Test Resources Management Center, and the Director of Cost Assessment and Program Evaluation to assess resource needs for test and evaluation as part of the development of the future years defense program.

What do you consider to be the most serious problems in the performance of the functions of the DOT&E?

The assessments that DOT&E prepares and the test planning in which it participates can be accomplished only if requirements for systems are realistic, relevant, and testable. A recent Defense Science Board Report identified deficient program requirements and inadequate systems engineering plans as major contributors to poor acquisition performance. Getting the requirements right and starting with a good systems engineering plan that is executable are essential for successful development and testing. Although DOT&E has implemented initiatives in this area, more should be done.

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

If confirmed, I plan to engage early in the requirements and acquisition processes to address the above issues. Early on, I would meet with the Joint Staff and the new Director, Systems Engineering to assess current practices and develop appropriate recommendations for change.

Relationships

If confirmed, how will you work with the following:

A. The Secretary of Defense

B. The Deputy Secretary of Defense

C. The Under Secretary of Defense for Acquisition, Technology and Logistics

D. The Under Secretary of Defense for Personnel and Readiness

E. The Director of Defense Research and Engineering

F. The Assistant Secretary of Defense for Networks and Information Integration

G. The Inspector General of the Department of Defense

H. The General Counsel of the Department of Defense

I. The Service and Agency officials responsible for major acquisition programs

J. The Directors of the Services' Test and Evaluation organizations

K. The Joint Requirements Oversight Council

L. The Director of the Defense Test Resource Management Center

M. The Director of Developmental Test and Evaluation

N. The Director of the Joint Improvised Explosive Device Defeat Office

O. The Assistant Secretary of Defense for Health Affairs

The Director's relationship with many of the foregoing individuals is described or defined in regulation or policy documents. If confirmed, I intend to follow those descriptions and develop strong working relationships with all these officials. Particular examples of how I would work with selected individuals include the following: To help implement the Weapon System Acquisition Reform Act of 2009, as well as to develop practices that institutionalize the conduct of integrated developmental and operational testing, I anticipate that I would be working particularly closely with the Under Secretary of Defense for Acquisition, Technology, and Logistics, the new Director of Developmental Test and Evaluation, the executives of the Service acquisition organizations, and the commanders of the Operational Test Agencies. I would also work with these individuals, as well as the Director of the Defense Test Resource Management Center, the Director for Cost Assessment and Program Evaluation, the Under Secretary

for Personnel and Readiness, and the Deputy Secretary of Defense, to assess resource needs for operational test and evaluation during development of the future years defense program. I would work with the Director of Cost Assessment and Program Evaluation to provide data on system reliability, availability, and maintainability, and any other data derived from operational testing needed to assist in the preparation of life-cycle cost estimates for acquisition programs. I would work with the Director of the Joint Improvised Explosive Device Defeat Office to assist in conducting rapid testing confirming the effectiveness of concepts and systems for use in ongoing operations.

Independence and Objectivity

Congress established the position of DOT&E as an independent and objective evaluator of the performance of major systems. Report language accompanying the National Defense Authorization Act for Fiscal Year 1984 (P. L. 98-94), which was codified as section 139 of title 10, U. S. Code, states that "the Director [is] to be independent of other DOD officials below the Secretary of Defense" and "not circumscribed in any way by other officials in carrying out his duties." In describing the Director's duties, the report also noted an expectation that the Director "safeguard the integrity of operational testing and evaluation in general and with respect to specific major defense acquisition programs."

Can you assure the Committee that, if confirmed, you will be independent and objective in your evaluations, and that you will provide your candid assessment of Major Defense Acquisition Programs to the Congress?

Yes. I believe the credibility and effectiveness of the organization depends upon both independence and objectivity. If confirmed, I assure you that I will be independent and objective in my evaluations and that I will provide candid assessments of the oversight I conduct to the Congress.

In your view, does the DOT&E have the necessary authorities under sections 139 and 2399 of Title 10, United States Code, and applicable Departmental regulations to carry out the duties prescribed?

Yes.

Section 2399 of Title 10, U. S. Code, establishes certain requirements regarding the impartiality of contractor testing personnel and contracted for advisory and assistance services utilized with regard to the test and evaluation of a system.

What is your view of these requirements?

I fully support the need for impartiality of testing personnel. Section 2399 bars personnel employed by a contractor involved in development or production of a system, from participating in the operational testing of that system. Further, it prevents such personnel from advising or providing assistance services, including planning and

subsequent data analysis, for the operational testing and evaluation. The participation of contractors is only appropriate if they are specifically intended to be part of the long-term system support structure. Section 2399 allows for this exception. In my view, Section 2399 allows the flexibility to properly structure operational testing and also properly provides for impartial contracted advisory and assistance service.

How will you maintain independence from the often conflicting goals of the acquisition community and the mandates for necessary operational testing?

The DOT&E authorities and responsibilities for operational test and evaluation and live fire test and evaluation set out in Title 10 USC, including direct reporting of assessments to Congress and the Secretary of Defense, are key to the office's ability to maintain its independence. If confirmed I will faithfully meet those requirements. Maintaining DOT&E as an independent organization with an independent budget is also essential.

Test and Evaluation Funding

Concern over long-term support for and viability of the Department's test ranges and facilities led to creation of the Defense Test Resource Management Center in 2002 and a requirement for direct funding of test and evaluation (T&E) facilities.

In your view, how are these changes working to address funding and sustainability concerns at the department's test ranges and bases?

I do not now have insight to accurately evaluate how well these changes are working. I am aware, however, that the Test Resource Management Center (TRMC) is responsible for determining the adequacy of the Service investment budgets for test and evaluation infrastructure. I understand that the Director of the TRMC has generally, but not always, certified the adequacy of those budgets. The services have the responsibility within the Department's planning, programming, budgeting, and execution system to provide funding for test and evaluation facilities. I understand that proposals have been made in the past to change where the budgeting authority resides. If confirmed, I will explore the need for additional changes in the methods the Department uses for managing its test and evaluation facilities.

Do you believe that the Department's T&E capabilities, including infrastructure and workforce, are adequately funded?

I do not now have sufficient insight into the details of the test and evaluation (T&E) budgets and current and projected needs for conducting T&E to make an informed assessment of the adequacy of current funding. I am concerned, however, that historical budget and policy trends, and increasing demands for testing, may have caused shortfalls in testing resources relative to needs. If confirmed, I would examine this issue carefully and work within the Department's planning, programming, budgeting, and execution

system to assess the adequacy of funding for T&E and to develop alternatives for consideration as part of the preparation of the future years defense program.

Do you believe that the Department's T&E capabilities, including infrastructure and workforce, are adequate to perform the full range of test and evaluation responsibilities of DOD weapons systems and equipment?

The DOT&E FY08 Annual Report suggests that further investment is necessary to modernize test and evaluation (T&E) capabilities. More generally, I am concerned that historical budget and policy trends, and increasing demands for testing, may result in shortfalls in testing capabilities relative to needs. If confirmed, I would work within the Department's planning, programming, budgeting, and execution system to assess the adequacy of T&E capabilities and to develop alternatives for consideration as part of the preparation of the future years defense program.

What are your views about the importance of accurately projecting future test facility resource requirements and budgeting for these needs?

In my view, test and evaluation (T&E) needs should be accurately reflected in the Test Resource Management Center's (TRMC's) DoD Strategic Plan for T&E Resources. If confirmed, I will work to ensure early involvement of DOT&E in identifying these needs for inclusion in that Strategic Plan, and later in the T&E strategies and Master Plans prepared for individual programs. Accurately defining these resources is essential in ensuring a program is executable at inception. Such projections also support and justify Service planning, programming, and budgeting for T&E assets and are needed by DOT&E and other members of the test community in developing program alternatives for consideration during preparation of the future years defense program.

How will the sufficiency of investments in test resources and workforces be factored into your assessments and review of proposed test plans and schedules for acquisition programs?

If confirmed, I would ensure that adequate test resourcing was always a consideration in every test program and any shortfalls are identified in test documentation. My approval of Test and Evaluation Master Plans and Test Plans would be contingent upon the availability of adequate test resources. Should a test resource shortfall impose unacceptable limitations on test adequacy, I would ensure it was corrected or would objectively report on the inability to adequately test the system.

How do you plan to evaluate and improve the operational testing workforce in DOD especially in light of the growing numbers of new technologies embedded in weapon systems and the desire to speed the acquisition and deployment of systems to the battlefield?

If confirmed, I will work with the Director, Test Resources Management Center and the Component Operational Test Agencies to evaluate workforce issues, including the adequacy of the size of the operational testing workforce and the skills resident in its members. Based on the results of that evaluation, I would make recommendations for consideration within the Department's planning, programming, budgeting, and execution system.

Office of the Director of Operational Test and Evaluation

How would you assess the adequacy of resources provided to the Office of DOT&E given the missions and responsibilities of the office?

I am aware DOT&E has added personnel in response to its increasing workload. If confirmed, I would review the total responsibilities of the office in light of the recent acquisition reform legislation---including its provisions regarding organizational conflicts of interest---and the Secretary's direction to speed fielding of critical equipment to the combat forces. After this review, if additional personnel and funding are needed, I would work within the Department's planning, programming, budgeting, and execution system to address those needs.

In your view, does the DOT&E have sufficient support from FFRDCs and other contractors to support designated missions?

I have not had the opportunity to familiarize myself with any deficiencies or other problems that DOT&E may be experiencing with contractor support. However, I understand from DOT&E's annual reports that its workload has been increasing. For example, the Secretary has delegated to DOT&E responsibility to provide oversight of the testing of critical equipment, such as body armor, being provided to our forces currently deployed in the field. The potential for increased workload within DOT&E to implement the Department's revised policies for integrated developmental and operational testing also exists because those policies require DOT&E to be involved earlier and more substantively in planning and monitoring testing. If confirmed, I will review DOT&E's current and projected workloads in each of its functional areas to determine if shortfalls in manpower exist that could be filled either by contractor support or government personnel. If shortfalls exist, I would consider whether additional contractor support would be the best method to fill them and what type of contractor support would be appropriate. However, with the consolidation of the Defense industrial base since the Cold War, I understand it has become increasingly difficult to identify contractors without either real or perceived organizational conflicts of interest (OCIs).

Additionally, the provisions of the Weapon Systems Acquisition Reform Act regarding OCIs (which I strongly support) could make identifying such contractors even more difficult, requiring greater reliance on either government personnel or federally-funded research and development centers (FFRDCs). Thus, in deciding on the best method to fill support shortfalls, I would need to consider the extent to which the manpower ceilings currently imposed by law on FFRDCs and increasing demand for using that constrained set of resources might limit the availability of FFRDC support to DOT&E.

In your view, does the DOT&E's current workforce represent the correct mix between government and contractor personnel?

The Secretary has decided that the Department should increase its use of government personnel providing in-house expertise and rely less on contractors. Moreover, I understand the need for DOT&E to deal appropriately with real or perceived organizational conflicts of interest, which also affects the mix of government and contractor personnel appropriate for use by the office. If confirmed, I will review the balance among DOT&E's government personnel and its use of contractors and FFRDCs, in the context of the office's future workload, its need to deal appropriately with organizational conflicts of interest, and its need to have in-house, government expertise.

Does the DOT&E need any special personnel authorities, such as those available to DARPA, medical personnel, service academies, or defense laboratories, to attract, recruit, and retain the workforce needed to perform designated missions?

I am unaware of any special personnel authorities needed by DOT&E at this time. If confirmed, I will consider the potential need for such authorities in conjunction with reviewing DOT&E's needs for both contractor support and government personnel.

Operational and Developmental Testing

What are your views on the appropriate point in concept development of a new acquisition program for incorporation of T&E planning and integration of testing requirements?

The test and evaluation community should be involved with both the requirements community and the system developers during early stages of the Materiel Solution Analysis to develop an evaluation strategy that can be reflected in the request for proposals. These relationships should continue during technology development, with emphasis shifting to evaluation of competitive prototypes, refinement of test and evaluation (T&E) strategies, and review of technology readiness assessments. During this phase, detailed T&E activities should be planned, resourced, and documented in a Test & Evaluation Master Plan (TEMP) that is reviewed and approved by both the Under Secretary for Acquisition, Technology, and Logistics and DOT&E.

What steps, if any, do you believe the Department should take to ensure that testing takes place early enough in the program cycle to identify and fix problems before it becomes prohibitively time-consuming and expensive to do so?

If confirmed, I look forward to working with the acquisition community---in particular the new Director of Developmental Test and Evaluation (D,DT&E)---to develop the practices needed to institutionalize the Department's guidance to conduct integrated operational and developmental testing. Conducting integrated testing as early as possible will foster earlier discovery and learning, and less costly correction of the deficiencies that are discovered. I also believe that implementing the provision in the Weapon Systems Acquisition Reform Act of 2009 requiring the Director of Defense Research and Engineering to work with the D,DT&E to demonstrate technology readiness prior to making major program commitments (that is, before Milestone B) will reduce risks. If confirmed, I will seek opportunities to work with those two officials to assist them in developing the practices needed to implement the Act's provision, including incorporating operational realism in testing conducted prior to Milestone B.

Acquisition programs continue to complete developmental testing satisfactorily, but perform poorly on operational testing suggesting that developmental testing lacks sufficient rigor or realism to adequately characterize the technical performance of a system under test.

What are your views on the current relationship between developmental and operational testing?

Recent changes to testing policy require Integrated Testing, which is the collaborative planning and execution of testing, with independent evaluation of test data. I believe that with Integrated Testing, the operational test community can help add rigor and operational realism to developmental test and evaluation. This will help make developmental testing a period of discovery and operational testing a period of confirmation.

Do you believe there is value in involving the operational test and evaluation community in providing input into developmental testing and, if so, at what point should that process begin?

I see tremendous value in involving the operational test and evaluation community in both developmental testing and requirements generation. I applaud the recent Integrated Testing efforts the Department has initiated to make testing as seamless as possible throughout the acquisition process. It is my understanding that DOT&E played a key role in this initiative. The operational test and evaluation community should help make early testing as realistic as possible, allowing identification and correction of deficiencies earlier in the design process when those deficiencies are less expensive to correct.

When is it appropriate for developmental and operational testing to be combined?

It is appropriate to combine developmental and operational testing when the objectives of both evaluations can be reasonably met. This may provide shared data at a reduced cost and on a shorter schedule.

Adaptation of T&E to Evolving Acquisition Strategies

If confirmed, how would you propose to achieve an appropriate balance between the desire to reduce acquisition cycle times and the need to perform adequate testing and evaluation?

It is my understanding the time consumed by operational testing is usually only a small percentage of the overall acquisition cycle time. Program delays in readying for operational testing usually are much longer than the time frame of the operational test itself. Because operational testing occurs near the end of the acquisition cycle, there can be great pressure to rush such tests. I feel that the early involvement of operational testers can contribute to reducing cycle time by identifying issues early in the development cycle when the problems can be solved with less impact on the program and at less cost.

What requirements and criteria would you propose to ensure an effective test and evaluation program is established for an evolutionary acquisition program?

An evolutionary acquisition strategy requires a test and evaluation (T&E) process incorporating a distinct set of testable objectives for each phase of the evolutionary program. If the system resulting from completion of a phase will be used in the field, those objectives should be related directly and clearly to how operators will use it; that is, to operational requirements. In my view, it is very important that the progress achieved in completing each phase of an evolutionary acquisition program (or, for that matter, of any program) be judged based upon rigorous testing incorporating appropriate operational realism, not dictated by a pre-set schedule. If a system that results from the completion of a particular evolutionary phase is to be deployed for use in the field, it should undergo operational testing and live-fire testing and evaluation before it is produced and fielded in large quantities. An evolutionary T&E process recognizes the results of developmental and operational testing conducted for previous spirals can be incorporated in testing subsequent spirals, as appropriate, thereby potentially reducing the time and effort needed to test later spirals. Thus, it is important that provisions be made for archiving data resulting from testing each spiral to allow for that data's re-use.

Recent equipment problems have brought to light potential testing deficiencies resulting from the fielding of systems that fell below the thresholds established for

oversight by the DOT&E. In many cases, such as with body armor, helmets, vehicle armor kits, and ammunition, the materiel involved is crucial to the everyday mission effectiveness and survivability of our military forces.

If confirmed, how would you ensure that critical equipment being fielded is effective, safe, and suitable for our military to take into combat?

Title 10, via delegation from the Secretary of Defense, now gives the DOT&E authority to designate any program for live fire test and evaluation oversight. I understand that DOT&E is working with the services to compile a list of critical equipment programs that should be made subject to oversight under this authority. If confirmed, I would complete the compilation of this list and exercise oversight over the programs on it to assure critical equipment is adequately tested and objectively evaluated for effectiveness, suitability, and survivability. I would provide my independent assessments of those tests to the Congress and the Department's leadership in a timely manner. The equipment's safety would be a key criterion determining my assessment of its suitability. I would periodically review the list of programs placed on this list for completeness and continued need for DOT&E oversight and adjust the list, as appropriate.

What are your views on the testing and evaluation of systems under spiral development?

I view the needs for effective testing and evaluation (T&E) of systems under spiral development as similar to those for effective T&E of an evolutionary acquisition program. It is important that systems under spiral development have an early T&E strategy and complementary T&E processes that identify a distinct set of testable objectives for each spiral. Each spiral can then be tested against those objectives and progress in development, including whether the program should proceed to the next "spiral," determined using the results of those tests. As in all programs, testing of systems under spiral development should incorporate as much operational realism as soon as possible in a robust developmental testing program. If a system that results from the completion of a particular "spiral" of development is to be deployed for use in the field, its should undergo appropriate operational testing and live-fire testing and evaluation before it is produced and fielded in large quantities. The results of developmental (and any operational testing) conducted for previous spirals can be incorporated in testing subsequent spirals, as appropriate, potentially reducing the time and effort required for testing later spirals. Thus, it is important that provisions be made for archiving data resulting from testing each spiral to allow for that data's re-use.

Do you believe that follow-on operational testing and evaluation should be required for each program spiral?

In my view, the significance of the changes made to a system's capability should determine the need for follow-on operational testing and live fire testing. Substantial enchancements in combat capabilitywould require follow-on operational testing and assessment. If follow-on testing is conducted, it should take advantage of data collected from testing done for previous spirals, as appropriate.

How should Service and Agency test organizations project future resource requirements given the uncertainty of testing demand given urgent operational needs and rapid fielding and development initiatives?

The Services should integrate resource requirements for test and evaluation into their projected program plans for rapid fielding and development initiatives. Because resource demands may change rapidly and unexpectedly as the size and character of ongoing operations evolves, the Services will need to re-evaluate their plans on a continual basis. Accomplishing these re-evaluations will require close consultation among operators, developers, and the Service Operational Test Agencies. If confirmed, I will help facilitate this consultation.

How will you improve the oversight that the DOT&E has over the activities of the Joint Improvised Explosive Device Defeat Office, the ISR Task Force, and other rapid fielding organizations?

I regard DOT&E involvement in assisting these organizations as a high priority. I believe that DOT&E must provide early advice to and conduct continual consultation with these organizations to provide oversight that helps---not hinders---the fulfillment of their objectives. I understand that DOT&E has established interfaces with these organizations and is using those interfaces to oversee their testing activities. If I am confirmed, I will review the results of that oversight and make adjustments to it, as necessary, in consultation with each organization's leadership. The extent to which DOT&E's oversight has improved each organization's ability to accurately and quickly characterize both the strengths and weaknesses of the capabilities they field will be key to determining any changes that may be needed.

Combination of Testing with Training Exercises

Some hold the view that the most representative operational testing would be to allow operational forces to conduct training exercises with the system under evaluation.

In your view, should testing be combined with scheduled training exercises for efficiency and effectiveness?

I believe that testing should be combined with scheduled training exercises in selected instances when it is feasible and when careful, advance planning can and has been conducted. Combined testing and training events can benefit testing through the presence of more realistic friendly and threat forces conducting operations in a broader, more varied context than would otherwise be the case in standalone testing. This additional realism can be used to simultaneously exercise modes of equipment operation that might not be possible or would be difficult to arrange on test ranges. For example, testing combined with joint force training exercises can offer unique opportunities to discover interoperability problems. Live, virtual, and constructive environments should all offer opportunities for combined testing and training.

What are the barriers, if any, to doing so?

There may be differences in the needs and goals of the testing and training communities that prevent both groups from achieving their objectives with a single event. Synchronizing schedules can be a problem, as training events are usually scheduled well in advance, and test events, although scheduled in advance, have a history of slippage due to development delays. I understand that the test community often requires that data be collected using methods not normally associated with a training exercise; in some cases those methods could be disruptive to achieving training objectives. Combining testing and training can also introduce the need to train military personnel from the field who are participating in an exercise to operate the new equipment under development to be tested while using tactics they are unfamiliar with. This can increase the cost and complexity of planning and execution for both the testing and training communities.

How can training and testing ranges be used more jointly and efficiently?

My review of publicly available DOT&E reports indicates that the Services frequently share the use of test ranges and other testing and evaluation infrastructure. Additionally, those reports indicate that testing is often conducted on ranges that are also utilized for training. I also understand that there is increasing competition for the use of both types of ranges. This trend, in conjunction with the concerns expressed in DOT&E's annual reports regarding shortfalls in both capability and capacity at the Department's testing ranges, indicates that more efficient, joint use of both types of ranges is needed whether or not additional resources are provided to modernize these ranges. If confirmed, I will work with the Service Operational Test Agencies and the Joint Staff to determine how test and training ranges can be used more efficiently and jointly and make appropriate recommendations.

"System of Systems" Testing

What inherent challenges exist for operational testing with regard to DOD programs that are a part of an overall "system of systems"?

The large number of individual components of a "system of systems" and the wide span of military capabilities those components provide pose challenges to operational testing. For example, the Army's Future Combat Systems (FCS) program was to be composed of 14 individual systems (ranging from manned ground vehicles to robotic vehicles to unmanned aerial systems) linked together by an information network. Considering the network, a realistic operational test would exercise all the potential linkages among all fourteen systems simultaneously. The information flow across the linkages would be realistic only if it were as large as would be expected if all fourteen elements were deployed and operating in numbers consistent with their employment in a brigade combat team. Testing would need to incorporate the network interruptions, dynamic establishment and dis-establishment of communications links, and other complications expected during combat in complex terrain. Adding consideration of the testing needs for other elements of FCS indicates that realistic operational testing of this "system of systems" would present unprecedented challenges in test planning, assembly of equipment, training of operators, simultaneous presentation of the multiple, disparate threats needed to stress each FCS element, and simultaneous collection of multiple flows of data. The use of modeling and simulation might mitigate these challenges somewhat (the development and verification of the simulations would also be complex), but would not eliminate them. These challenges are present in testing the Ballistic Missile Defense System and any other "system of systems."

How should a "system of systems" be tested to assess the effectiveness of the whole system?

Constraints on the environments that can be created in test ranges will probably require that operational testing of systems of systems comprise a combination of "open air" testing of the system's components on ranges---alone and in combination---in conjunction with modeling and simulation. Careful planning of "open-air" tests will be required so that selected aspects of the performance of individual components can be demonstrated and all the data needed to verify, validate, and accredit the models to be used is collected. The combination of open-air testing and modeling should be constructed to stress and exercise all the system's components under the full set of operational conditions to be expected. According to recent testimony to the Congress by DOT&E, this is the approach that the Director of the Missile Defense Agency is attempting to use in planning the testing conducted on the Ballistic Missile Defense "System of Systems."

Testing of Information Systems

What are the major unique challenges to the testing of information systems?

I believe the major challenges to testing information systems can be grouped into three areas: interoperability, information assurance, and sustainment. The overwhelming majority of the Department's information systems are expected to exchange information, or network, with a variety of other systems. Development and testing of systems that can all be simultaneously evolving poses configuration management challenges. For example, a data link system may have to operate with an aircraft's mission computer and display systems as well as with the decision and display systems in command centers ashore or afloat. Secondly, realistic information assurance testing must account for the rapidly maturing and the ever-changing cyber threat. Even with a modular architecture, introduction of new software code can potentially introduce new system vulnerabilities. Third, the rapid pace at which industry has upgraded the commercial hardware and software that underpin DoD systems, challenges the Department's ability to successfully integrate, test, and field updates.

What role do you believe DOT&E should play in testing of major automated information systems and other enterprise information systems?

I believe that DOT&E should continue to exercise oversight of the testing of major automated information systems and enterprise information systems to help ensure that users are delivered the systems they need to accomplish their missions around the world. DOT&E should ensure that these systems are operationally effective and suitable when operated by typical users in an operationally realistic environment. Among other considerations, this means that testing should exercise under realistic loading all the linkages among these systems expected in operational use. According to DOT&E's annual reports, testing of linkages between new and legacy systems under realistic loads has a history of revealing unanticipated problems; thus, this testing should be accomplished as early as possible in the development of these systems.

Are you satisfied with the Department's capabilities to test and evaluate information systems, including embedded software?

I have not had the opportunity to carefully review all of the Department's capabilities to test and evaluate information systems. If confirmed, I will review this area carefully to ensure adequate testing and evaluation is being performed.

What role, if any, should commercial sector testing play in the Department's testing and evaluation of commercial information systems that are being modified to support defense needs?

I believe that commercial sector testing can make a significant contribution in the overall test and evaluation process. The use of third party commercial testing could be particularly useful in development, where it might offer test resources that are not available within the Department.

Recent defense authorization legislation provided the DOT&E with oversight responsibility for information assurance (IA) evaluations of fielded systems. There has reportedly been an increased focus on IA as an evaluation issue for systems on the operational T&E oversight list and a group of acquisition programs have been identified for an expanded review of the adequacy of IA evaluation planning.

Does the test and evaluation community of the Department possess adequate expertise, staffing, and funding to carry out its IA responsibilities?

I currently do not have sufficient insight into the information assurance capabilities of the test and evaluation community to provide an accurate and objective assessment of the adequacy of those capabilities. I am concerned, however, that the same trends in funding and policy that led Secretary Gates to direct that additional government civilian employees be hired might have adversely affected the government's test and evaluation workforce overall, as well as in this particular area. The adequacy of the Department's expertise and staffing in information assurance is of particular concern to me because of the competition for people with these skills across the government, as well as in the private sector. If confirmed, I will examine this issue carefully in order to make an informed assessment and recommendation.

What are the major challenges that you see in operational testing of information assurance systems?

My impression is that there are two related challenges in the operational testing of information assurance for both development and fielded systems. For systems in development, a key challenge is to adequately emulate the operational environment in a secure test facility so that developers can assess the system's performance when it is exposed to realistic, sophisticated threats. For fielded systems, significant operational and security challenges arise in portraying realistic threats against live systems on networks being used for operational and training missions.

<u>Live Fire Testing</u>

The live fire testing program is a statutory requirement to assess the vulnerability and survivability of platforms, while also assessing the lethality of weapons against the required target sets.

Do you believe that the Department's current live fire testing program is accomplishing its purpose?

I believe so. The recent testing of the Mobile Gun System, mine resistant ambush protected (MRAP) vehicles, and Body Armor overseen, assessed, and independently reported by DOT&E illustrate the value of robust live fire testing. DOT&E reports also indicate live-fire testing plays an important role in assessing a system's overall effectiveness and suitability.

What are the major challenges facing the live-fire testing program?

I believe that conducting adequate testing early enough to improve a system's design without the need for costly changes and retrofits is a key challenge for both operational testing, as well as live-fire testing. Specific examples of challenges related to live-fire testing of which I am aware appear in the DOT&E annual report. That report expresses a concern with the elimination of vulnerability reduction features on the Joint Strike Fighter made to reduce weight during trade space analysis conducted on the aircraft's systems. If this reaction to weight growth in aircraft design foreshadows a more widespread trend, it would be extremely troubling. Similarly, I understand that full-ship shock trials of Navy ships are increasingly constrained by environmental considerations.

What is the Department's role, if any, in the research, development, and acquisition process with respect to live fire testing for Preliminary Design Model tests, First Article Tests, and Lot Acceptance Tests?

The Department's role in these tests normally associated with Personal Protection Equipment varies by the nature of the test. Preliminary Design Model tests, typically utilized to screen viable systems before making contract awards, are a responsibility of the acquisition or program manager. In my view, First Article Testing is inherently governmental, as it qualifies a design and leads to full rate production contracts and fielding of equipment. The authorities contained in 2009 National Defense Authorization Act enable the Department to exercise oversight of this testing in a manner similar to the DOT&E authorities for operational testing. Lot Acceptance Testing is in many respects an extension of First Article Testing, in that it supports the acquisition of specific lots of the design qualified in First Article Testing. In my view, government oversight of these tests should focus on ensuring that common standards are used to conduct them.

Is live fire testing to determine if weapons systems, vehicles, or personal protective equipment meets military and contract specifications for procurement an inherently governmental function, a function that can be outsourced, or a function that can use a mix of government and commercial facilities?

I believe testing that leads to production decisions is inherently governmental and should be conducted by the Services at government facilities. This is the norm and typically a requirement for all major acquisition programs. This fundamental practice should also be applied to critical personal equipment such as body armor and helmets. The Services must be provided sufficient resources to conduct this level of testing. I note the recent Army policy letter that requires all body armor testing to be conducted by their

operational test agency. This is a reasonable policy and does allow for the use of commercial facilities if needed for subsequent lot testing. I agree with the recent report by the defense Inspector General that documented the need for adequate government oversight if testing is conducted at commercial facilities.

Modeling and Simulation

Advances in modeling and simulation have provided an opportunity to streamline the testing process, saving time and expense.

What do you believe to be the proper balance between modeling and simulation and actual testing of the developed product?

Modeling and Simulation (M&S) can contribute to the assessment of system performance, particularly to explore the full range of system operation where live, "open-air" testing would be unsafe or is impractical. M&S is also useful as a tool to help plan the test program. However, M&S should be utilized to complement, rather than replace, operational testing in a realistic environment. Additionally, sufficient operational testing should still be performed to adequately validate and accredit any models used. This is often the greatest challenge.

Are there areas in modeling and simulation that need to be advanced in order to improve its utility as a tool for operational and developmental testing?

I am not aware of any specific areas at this time. However, if I am confirmed I will review the use of modeling and simulation in operational testing and make recommendations for improvements to the testing community, as appropriate.

T&E Science and Technology

What are your views on the appropriate level of investment in the science and technology (S&T) of testing?

I believe strongly in the need for a robust S&T effort to support test and evaluation. This effort should be a part of and consistent with the overall S&T investment strategy of the Department.

What mechanisms will you employ to ensure the S&T portfolio is responsive to the Department's future test instrumentation needs?

If confirmed, I look forward to working with the Under Secretary for Acquisition, Logistics, and Technology (AT&L) and his subordinate organizations, such as the Director of the Test Resources Management Center (TRMC), to ensure that the projects funded in the S&T portfolio support the Department's future instrumentation needs. I am

particularly interested in assuring that the S&T program supports the development and fielding of embedded instrumentation that can be used by testers, trainers, and operator-maintainers. Therefore, I would work with AT&L to develop alternatives that provide adequate resources for the associated S&T activities as part of the development of the future years defense program.

What areas should the Department's S&T program be investing in to improve the quality of current and future testing capabilities?

The emerging concepts the Department is pursuing involving urban operations, directed energy, chem-bio, chemical weapons effects, hypersonics, netcentric systems, and unmanned/autonomous systems will all likely require advances in test range instrumentation and other capabilities for conducting both developmental and operational testing. The need for these advances may already be included in the TRMC's strategic plan for the Department's test and evaluation resources. If confirmed, I would work closely with the Director of TRMC in this area.

Operational Test Agencies

Operational Test Agencies (OTAs) are tasked with conducting independent operational testing and evaluation of acquisition programs. Recent demands on these organizations have increased to meet rapid acquisition initiatives, to demonstrate joint and advanced concept technology programs, and to evaluate information assurance, information operations, and joint T&E requirements.

In your view, are these agencies sufficiently staffed to perform the required functions?

I am not aware of any specific staffing shortfalls at this time. I am concerned, however, that the long-term trends that caused Secretary Gates to direct that the government workforce be increased, in conjunction with increasing workload, may have created shortfalls. If confirmed, this is an area that I will explore in greater detail.

How would you propose to arbitrate shortfalls between program managers' limited funding and OTAs independent test requirements?

Title 10 and DoD Directives require DOT&E to assess the adequacy of operational testing. Service leadership retains the responsibility to ensure programs are managed and funded to meet testing requirements. If confirmed, I will only approve Test and Evaluation Master Plans and test plans that are executable within available resources.

Do you have any concerns about the independence of the OTAs?

There will always likely be concerns regarding the independence of the OTAs. If confirmed, I will be vigilant to protect their independence. I believe that the OTAs

should report to the top of their Service leadership, independent of the Service acquisition organizations.

Should policies and procedures of the OTAs be standardized across the Department of Defense?

Each of the Component OTAs has processes for the conduct of OT&E that are tailored to their organizational construct and the kinds of systems they must evaluate. As long as these processes lead to robust operational test and evaluations, I do not believe DOT&E should dictate standard processes that may limit component flexibility. I do, however, believe the capability to develop, test, train, and experiment with complex systems in a Joint operational environment needs improvement. If confirmed, I will work with the Combatant Commands, Joint Forces Command, Service Leadership, and the Component OTAs to improve our abilities to test and evaluate in a realistic joint operational environment and make appropriate recommendations for any changes needed in policies and procedures.

Ballistic Missile Defense

The United States is developing and fielding a Ballistic Missile Defense System (BMDS) that is intended to defend the United States, its allies, and friends against rogue nation ballistic missiles of all ranges in an operationally effective and cost-effective manner.

Can you assure the Committee that, if confirmed, you will evaluate the testing of the Ballistic Missile Defense System, and that you will make a determination of whether the system and its elements that are tested are effective, survivable, and suitable for combat?

Yes. DOT&E provides an annual report covering all DoD oversight programs, including the Ballistic Missile Defense System (BMDS), as well as a separate annual assessment report of the BMDS to the Congress. If confirmed, I will continue to assess BMDS system operational effectiveness, suitability, and survivability and test adequacy in these reports.

If you determine that such testing and evaluation is not adequate, or does not demonstrate that the BMDS or its elements are effective and suitable, or survivable, will you inform the Congress of that determination?

Yes. If confirmed, I will provide my frank and objective assessments of test adequacy and BMDS system and element effectiveness, suitability, and survivability.

According to Title 10, U.S. Code, Major Defense Acquisition Programs are required to complete Initial Operational Test and Evaluation before proceeding beyond low-rate initial production. This is to ensure that weapons systems work effectively before they are produced in large numbers and at great expense. The Defense Department had previously exempted the Ballistic Missile Defense System (BMDS) from this requirement, saying that there will be only one BMDS, and thus no question of proceeding beyond low-rate initial production. There were also no plans or requirements for operational test and valuation of the BMDS or its elements.

Do you believe that any BMDS we deploy should be operationally effective, suitable, and survivable?

Yes. I believe that the MDA and operational test community should demonstrate through rigorous testing and verified, validated, and accredited modeling and simulation, that the elements to be deployed are operationally effective, suitable, and survivable.

Do you believe that the BMDS and its elements should undergo operational test and evaluation?

Yes. As with all major defense acquisition programs, I believe that the BMDS and its elements should undergo operational test and evaluation to demonstrate its capabilities. This is particularly true given the strategic importance of the BMDS. Independent operational testing should be included in the overall program and should occur once the incremental development of a given element or group of elements has been completed.

What do you believe is the appropriate role for the office of the DOT&E in providing an independent and objective assessment of the operational effectiveness, suitability, and survivability of the BMDS?

I believe it is the role of DOT&E to ensure adequate test planning, oversee the conduct of testing in accordance with approved test plans, independently assess the operational effectiveness, suitability, and survivability of the BMDS using all relevant and appropriate test data, and report our findings to the Congressional defense Committees and the Secretary of Defense.

<u>Master Test Plan for BMDS</u>

Testing and evaluation of Major Defense Acquisition Programs is normally implemented according to a Test and Evaluation Master Plan (TEMP), which must be approved by the Director of Operational Test and Evaluation. However, this has not been the case for the Ballistic Missile Defense System or its elements.

Do you believe that the test and evaluation of the BMDS and its elements should be implemented according to a TEMP, or its equivalent, and that this plan should

include such features as goals and objectives, methodologies, criteria for evaluation, planned infrastructure, and schedule?

Yes. Historically, well-prepared and resourced TEMPs have not only promoted disciplined testing of the Department's acquisition programs but also fostered successful assessments of operational effectiveness, suitability, and survivability. In 2002, the Secretary of Defense relieved the MDA from the requirement to produce a TEMP for the BMDS. Instead, the Agency has produced a similar document known as an Integrated Master Test Plan (IMTP). It is my understanding that Agency's IMTP does contain such features as goals and objectives, methodologies, criteria for evaluation, planned infrastructure, and schedule.

Ground-Based Midcourse Defense (GMD)

Concerning the Ground-based Midcourse Defense (GMD) system, the DOT&E annual report for 2008 states that, "GMD flight testing to date will not support a high degree of confidence in its limited capabilities."

Do you agree that our objective should be to have a high degree of confidence in the capabilities of the GMD system, and do you believe that our test and evaluation program for the GMD system should be designed and implemented to provide a high degree of confidence in the system?

Yes. I believe that it is essential that operational decision makers have the greatest possible understanding of the capabilities and limitations of the GMD system, as well as the entire Ballistic Missile Defense System (BMDS). In particular, those decision makers need high confidence in the accuracy of the performance estimates that underpin the determination of those capabilities and limitations.

Do you agree that it is essential to conduct testing of the GMD system that will allow the validation, verification, and accreditation of the models and simulations necessary to predict and understand the performance of the system?

Yes. Modeling and simulation, anchored by a robust program of flight and ground testing, and exercised over the battlespace using operationally realistic threat, mission scenario, and environmental models, is necessary to develop high confidence assessments.

The January 2009 DOT&E "2008 Assessment of the Ballistic Missile Defense System (BMDS)" states that, for the GMD system, "all intercepts have occurred within a small portion of the threat battlespace and under nearly the same intercept conditions." It also reports that the GMD system "has not demonstrated interceptor performance in a salvo defense (multiple interceptors against a single target) or in a multiple simultaneous engagement (multiple interceptors against multiple targets) in a flight test."

Do you agree that flight testing for the GMD system needs to be rigorous and operationally realistic, in order to demonstrate capability in a more representative portion of the possible operational conditions?

Yes. I believe there should be robust, operationally-realistic testing of, not only the GMD, but all the constituent elements of the BMDS, so that we fully understand the systems' capabilities and limitations. The modeling and simulation used to evaluate the full capabilities of the BMDS must be verified and validated before the BMDS Operational Test Agency Team can accredit it for use in assessing BMDS performance. The flight test program must be carefully designed to collect the required performance data that can then be used to verify and validate the models and simulations.

Do you agree that the system testing should include such operationally realistic features as salvo testing, multiple simultaneous engagement testing, and an intercept test using the Cobra Dane radar as the operational sensor, if possible?

Yes. I support previous DOT&E recommendations and testimony to the Defense Committees that the MDA should perform salvo testing and multiple simultaneous engagement testing of the GMD. I also support the proposal to conduct a GMD intercept test using the Cobra Dane radar as the operational sensor; however, I understand General O'Reilly has testified that there are unique challenges associated with the need to conduct such as test from within or nearly adjacent to the Russian Flight Information Region. If an intercept test is not feasible, alternatives, such as a target fly-by, should be investigated.

Medical Technologies

What role should the DOT&E play in the testing and evaluation of medical technologies such as combat casualty care technologies, drugs, vaccines, and other medical technologies before their operational use by the Department of Defense?

I understand DOT&E has been overseeing the operational test and evaluation of automated information systems that support medical care delivery, such as the Composite Health Care System, the Armed Forces Health Longitudinal Technology Application, and the Theater Medical Information Program. I believe that this is an appropriate role. On the other hand, medical technologies such as combat casualty care technologies, drugs, and vaccines are highly specialized and clinical in nature. The test and evaluation of these medical technologies is probably better suited for specially trained medical professionals with expertise in this area. I am not aware that DOT&E has this expertise.

Encroachment and Environmental Issues.

As is the case with military training, DOD test and evaluation efforts can be hampered by encroachment and constrained by environmental regulations, both on land and at sea.

To what extent do you believe encroachment and environmental requirements on and around test and evaluation ranges are affecting the quality and quantity of DOD's test and evaluation programs?

I understand the importance of these issues. Based on the recent DOT&E Annual Reports and other reports to Congress, it appears that the Department has been able to conduct its test operations adequately while making compensating adjustments to address environmental issues where necessary. However, those reports also raise concerns regarding limitations that testing is experiencing due to encroachment and other related problems. If confirmed, I will monitor this area carefully.

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.

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

Yes.

Do you agree, if confirmed, to appear before this Committee, or designated members of this Committee, and provide information, subject to appropriate and necessary security protection, with respect to your responsibilities as the Director of Operational Test and Evaluation?

Yes.

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

Yes.

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

Yes.