

DOT&E Leaders Speak Out About Past and Future Challenges and Priorities

Ernest Seglie, Ph.D.

Science Advisor, Operational Test and Evaluation
Office of the Secretary of Defense, Washington, DC

On February 18, 2009, ITEA sponsored a workshop on “Future Defense Spending and the Implications for Test & Evaluation,” to focus on the impact of the economic downturn and the change of administration on Defense system acquisitions and test and evaluation (T&E). The final panel of the day featured the Department of Defense’s senior T&E leadership, past and present (Phil Coyle, Jack Krings, Tom Christie, and Chuck McQueary). The four Directors of Operational Test and Evaluation answered 13 questions. Their answers offer insight into defense leadership processes and T&E considerations that we rarely have the opportunity to see in such a comprehensive manner, offer important insights into challenges the defense T&E community has faced, and may portend the nature of challenges that lay ahead.

Key words: Bridges to the Warfighter; defense leadership; defense spending; early involvement; fly before buy; information technology and assurance; joint testing; T&E workforce.

On February 18, 2009, ITEA sponsored a workshop on “Future Defense Spending and the Implications for Test & Evaluation” to focus on the impact of the economic downturn and the change of administration on Defense system acquisitions and test and evaluation (T&E).

The final panel of the day featured the Department of Defense’s (DoD’s) senior test and T&E leadership, past and present (*Figure 1*):

- The Honorable John E. (Jack) Krings, Former Director, Operational Test and Evaluation;
- The Honorable Philip E. Coyle, III, Former Director, Operational Test and Evaluation;
- The Honorable Thomas P. Christie, Former Director, Operational Test and Evaluation; and
- The Honorable Charles E. McQueary, Current Director, Operational Test and Evaluation.

As most readers know, the Director, Operational Test and Evaluation (DOT&E), is appointed from civilian life by the President, by and with the advice and consent of the Senate—as all the panelists were for their tenure. By law, the Director is appointed without regard to political affiliation and solely on the basis of fitness to perform the duties of the office of Director. The Director is the principal adviser to the Secretary of Defense and the Under Secretary of Defense for

Acquisition, Technology, and Logistics on operational T&E in the DoD, and the principal operational T&E official within the senior management of the DoD.

Defined in Title 10, US code, section 139, the Director’s duties are to:

- set policies and procedures for the conduct of operational T&E in the DoD; provide guidance to and consult with the Secretary of Defense and the Under Secretary of Defense for Acquisition, Technology, and Logistics and the Secretaries of the military departments;
- monitor and review all operational T&E;
- coordinate operational testing conducted jointly by more than one military department or defense agency;
- review and make recommendations to the Secretary of Defense on all budgetary and financial matters relating to operational T&E, including operational test facilities and equipment; and
- monitor and review the live fire testing activities.

The Director may communicate views on matters within his/her responsibility directly to the Secretary of Defense and the Deputy Secretary of Defense—without obtaining the approval or concurrence of any other official within the DoD.

Clearly, individuals qualified to be Director are accomplished persons with substantial credentials and

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE JUN 2009		2. REPORT TYPE		3. DATES COVERED 00-00-2009 to 00-00-2009	
4. TITLE AND SUBTITLE DOT&E Leaders Speak Out About Past and Future Challenges and Priorities				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Office of the Secretary of Defense, Operational Test and Evaluation, Washington, DC, 20301				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



Figure 1. The Directors of Operational Test and Evaluation past and present are (left to right) Phil Coyle, Jack Krings, Tom Christie, and Chuck McQueary.

capabilities. Each former Director brought to the job a unique perspective and experienced a different environment. Jack Krings was an experimental test pilot and the first DOT&E. Phil Coyle was a Director of the Lawrence Livermore National Laboratory, served the longest and under the most Secretaries of Defense. Tom Christie was a defense analyst and had served within the government the longest before assuming the DOT&E job. Chuck McQueary in the private sector was president of an advanced technology company; just prior to becoming DOT&E he was Under Secretary for Science and Technology in the Department of Homeland Security. The panel provided us a rare opportunity to glimpse a bit of the history of T&E and also to gain insight into what the future might hold. This panel was, indeed, a special event.

A panel moderator on February 18 prompted these Directors with a series of questions. Their answers are reported here. For this article, I do not include traceability of response to individual. It is fair to say, in most cases, all the Directors were in agreement with each other's responses. But you will note a few differences.

1. The Department faces hard choices in acquisition. Some have said DOT&E results are erratic and ignored. Are DOT&E reports given the right weight in acquisition decision-making?

There was considerable agreement that DOT&E reports are not as influential as they might be.

Evidence offered for this position included: (1) many programs are in trouble; (2) DOT&E reports such as the Annual Report repeat the same recommendations year after year; (3) some programs use great inventiveness to avoid testing; and (4) so many programs go to full rate production despite failure to be declared effective and suitable.

On the other hand, there is evidence that the situation may change. The new administration appears to have a "fly before buy" approach, and the White House website includes a statement on missile defense that supports the approach: "The Obama-Biden Administration will support missile defense, but ensure that it is developed in a way that is pragmatic and cost-effective; and, most importantly, does not divert resources from other national security priorities until we are positive the technology will protect the American public." The phrase "we are positive the technology will protect" is a high standard, consistent with fly before buy, and one that could require considerable testing evidence. Another positive note is that the Department has instituted new policy that emphasizes testing and particularly testing to improve reliability.

A final point that was made several times by all the panel members: reports are the formal means of communication, but often are not the most effective. The most effective means are often informal, in smaller meetings or in discussions with decision-makers. Different panel members had different relations with

the Secretary, the Deputy Secretary, or the Under Secretary of Defense for Acquisition, Technology, and Logistics but each found a reliable and consistent audience with one of them who was willing to listen. The Director must bring a track record of candor and expertise and achieve senior level relationships needed to influence properly the acquisition decisions. This situation brought up the following question.

2. Should DOT&E have a more formal role in the choices made to implement the slowdown coming in defense dollars?

None of the panelists felt that a formal role was a clear way ahead. DOT&E can offer information to those who need to make the decisions, and there is hope that those decisions would include more information on performance from developmental testing and operational testing rather than just cost and schedule. But if its role were more formal, the value DOT&E can bring by early involvement might be countered by increased difficulty getting into the program.

The importance of early involvement was emphasized by each panelist as a way of realizing several important goals, such as to develop the formal policy of integrated testing, to hopefully generate greater use of performance information in early decisions, to facilitate greater involvement of DOT&E early in a program when they often get into trouble, and to promote greater understanding of whether the system is ready for its initial operational T&E.

3. Will budget cuts be directed at T&E?

The panel members all believed that budget pressure is likely to be big and real. Their views reflected various aspects of the situation. The actual experience of the last decade and a half is indicative. When budgets went down, testing was cut; when budgets went up, testing was cut. In addition, workforce personnel have been decimated to the point where, in particular, developmental test has critical shortfalls. The pressure may be particularly intense in the Service budgets. So it might not be unreasonable to expect budget cuts to be directed at T&E. On the other hand, without T&E information how can leadership make the decisions they need to make? Independent, experienced, objective reporting of real program progress and potential should be among the last things to cut.

The protection of T&E may well rest with the Congress, where there has been continuing support. Congress has always been protective of the information that testing provides and therefore protective of the testing organizations when they know about the problem.

4. Secretary Gates has worried about a risk adverse culture and adversarial relationships within the DoD. Is that a problem in T&E?

Everyone agreed that whenever you have individuals working together there will be friction, possibly no more in DoD than in other organizations. Building strategic relationships is essential to successful operations. It is important to maintain good relationships at the top levels—with, for example, the Under Secretary of Defense for Acquisition, Technology, and Logistics—and simultaneously preclude adverse action from being taken against DOT&E action officers. DOT&E action officers can tell amazing stories about how difficult the job can be.

Most panel members believed that DOT&E, and T&E in general, have a public relations problem. This can arise merely because many people say there is a problem! To counter the public relations problem DOT&E needs to be aware of what flexibility there is in the system, articulate that flexibility, show some flexibility, and thus work to change conventional wisdom.

On the issue of risk, it was pointed out that Defense is not like the private sector because there is not an alternative if the project fails. It is not the entrepreneur who is at risk if the system fails, it is the combatant.

5. How should operational T&E adjust to account for threat changes?

Opinion across the panel was unanimous that DOT&E's responsibility is to assure systems are tested against the threat when the system is fielded regardless of whether that is the threat in the requirements. Further, the Beyond-Low-Rate-Initial-Production report must indicate whether the system is operationally effective and suitable in the environment in which it will be used. Some systems take 20 years to develop, and for those systems it is not unusual for the threat to change. But it is unusual for the threat to change in the year before the initial operational T&E, and that is a reason to be involved in the developmental testing. It is possible to respond to threat changes during development.

6. What does it mean to be involved early enough to enable integrated T&E?

Integrated can have two meanings, and there was a discussion of both. On one hand, it can mean joint. The testing must be joint, or integrated, in order to test acquisition systems as they will be used in the state-to-state and highly asymmetric warfare environments. In missile defense, integration is so important—it is mandated from within the Missile Defense Agency

(MDA) organization. That kind of integration does not come naturally.

The second meaning of integrated is that developmental and operational testers collaborate in the planning and execution of the test. An industrial software best practice does development very differently than the DoD. They start testing with a small group of very sophisticated users and find many problems that they fix. They then expand to a larger group of less sophisticated users, working their way down to users who are “all thumbs” with computers. Throughout that process they collect large amounts of data on the user response. In contrast to this situation, software developers in government often do not know who the user is, much less collect data on what the user is doing or if the user is happy. When considering that situation it is clear that the DoD has a long way to go and DOT&E should be part of that journey.

7. The Defense Science Board recommended developmental T&E should be strengthened. Do you agree?

The information available at milestone B is often critical. Testing has to be built-in from the very beginning. It is Developmental Test (DT) that has information about technical risk. DT has to be strengthened to report the critical information when it is most meaningful. Equally important is that DT have an independent voice, a seat at the table, and an audience willing to listen. DT is rooted in system engineering. But also expressed was the view that we will be no better off unless an effective linkage between developmental T&E, systems engineering, and reliability is created.

8. What is the meaning of early operational test (OT) involvement, with competitive prototypes?

Prototyping in aircraft may be different from trucks or tanks or radios. Operational assessment is very important, but for large complex systems prototyping to do more than demonstrate a concept or fundamental technology is nearly impossible. The information at milestone B is often critical—OT must be involved to cure the problem of underestimating technology maturity. But in the past there has been resistance. Recent experience has been somewhat different, and the Operational Test Agencies are changing the roles and engaging early. One example of early involvement was the program during Secretary Perry’s tenure of doing Advanced Concept and Technology Demonstrator assessments.

9. Should there be an increase in the T&E workforce to strengthen DT?

The panel talked about many aspects of the problem and solution. They unanimously thought it was appalling what has happened to the DT workforce in the field, where we find the government depending upon contractor data. We need enough knowledgeable people at least to know if you have a competent contractor. DoD often does not even have that. The funding to reverse this situation will be difficult.

The leadership role is with the Office of the Secretary of Defense (OSD) to create a viable plan to start reconstituting the workforce. The Services have plans, but they will not get the people unless pressure comes from the top—in OSD. Without addressing workforce issues, do we have the talent needed, for example, to fulfill the important reliability initiative?

10. What about the DoD Test Resource Management Center (TRMC)?

Two of the panelists, Jack Krings and Tom Christie, had significant roles in the establishment of the TRMC. Both felt that the original plan, which involved giving budget authority to the TRMC, was essential to enable the TRMC to carry out its very difficult mission. They recalled that originally the DT office also had authority over the Major Range and Test Facility Bases and agreed that it is difficult even to get a comprehensive report about Service needs. It is also true that DOT&E still has a role (mentioned earlier) with respect to resources for operational T&E. One of the difficulties for the TRMC is the layers of approval they must go through. The organizational solution should consider an enterprise approach.

11. Are OTs too hard, too easy, or about right?

There is no ready-made answer. It depends on the system and the mission. For example, the F-35 is a very complex system and will require many sorties to have the data necessary to evaluate system effectiveness and suitability, including the electronic warfare environment.

Early in the history of DOT&E there was talk of having a Milestone IV to have a feedback to see if DOT&E got it right. We found many fielded systems with actual mission operations that were different than what we tested. The Bradley Fighting Vehicle fording capability comes to mind. We focused on Bradley effectiveness in fording operations, but never tested a tube-launched, optically tracked, wire-guided missile configuration because the role of the system changed after fielding. Maybe we need more time with the end

user before we commit to OT plans. And, we need a continuous feedback loop.

We saw many examples where we learned much in OT. Good OT ought to be really easy; if DT is done well there are no surprises. We should try everything. The F 18-E/F OT was straightforward because of robust DT.

What do we do when we do not get it right, like not recognizing the threat of explosively formed projectiles? We have a critical job and must reduce the risk in such situations. We need classic sequential processes and concurrent DT/OT.

12. Should the director, OT&E have a statutory 5-year term?

Phil Coyle, who served 8 years as DOT&E, said that 5 years would have deprived him of many years he served in that position, and the legislation should say at least 5 years.

Others reiterated an earlier point that the right relationship with the senior leadership is critical and fixing a term does not ensure that relationship.

13. The last question: What is the next action DOT&E should initiate—the most important thing DOT&E should pursue now?

A number of areas were identified as important for the future. The answers were:

- Bridges to the warfighter. Working under Secretary Gates, there is an opportunity that stems from instances of lack of support in certain military departments for the warfighter. DOT&E should build new bridges to the warfighter; Secretary Gates would find that appealing.
- Joint testing. There are no real requirements for joint testing. Nevertheless, system interdependencies are now more important than ever. It is absolutely necessary to do interdependency testing and it will not happen naturally, but must be leadership-driven. This testing would be similar to interoperability testing.

- A better model for the acquisition and testing of defense equipment and services. Systems are acquired by some very new acquisition means—some call it slogan-based acquisition, spiral based acquisition, for example—you need a compatible flow of Operational Testing to match the acquisition flow. The high value of testing comes not from verification but from discovery. The cost of discovery goes up an order of magnitude with each successive phase. The process of testing should be built around the value of testing.
- Early involvement. The OT community must focus on early involvement, especially in the requirements process. There is a manpower issue to resolve: OT agency staff levels were not predicated on such early engagement.
- Information technology and information assurance. Information systems—and especially information assurance of complex software systems—constitute a pressing area where DOT&E must focus.

The answers of the four Directors of Operational Test and Evaluation reported above offer an insight into defense leadership processes and T&E considerations that we rarely have the opportunity to see in such a comprehensive manner. Their answers offer important insights into challenges the defense T&E community has faced, and they may portend the nature of challenges that lay ahead. It is indeed rewarding that ITEA convened this special event. □

DR. ERNEST SEGLIE is science advisor, Office of the Director, Operational Test and Evaluation (DOT&E), the Pentagon, Washington, D.C. He provides scientific and technical guidance on the overall approach to Department of Defense (DoD) evaluation of the operational effectiveness and suitability of major DoD weapon systems, provides technical review of test reports, and serves as chief technical advisor to the Director, DOT&E.