

In the March-April 2001 issue of *Program Manager Magazine*, John Stoddart, an industry member of the Industrial Committee on Operational Test and Evaluation (ICOTE), discussed his vision for changes in contractor involvement (or the lack thereof) in operational testing and evaluation. We may differ in some of the details of how to implement these changes, but we in the Army Test and Evaluation Command (ATEC) agree on the general thrust and intent of the recommendations. However, based on our experience in Army testing and evaluation, we are somewhat surprised at some of the misconceptions and myths found in the article.

The purpose of this letter is threefold — to add support to Stoddart's basic recommendations, to dispel some of the myths, and to point out some limitations that must be imposed on these recommendations. I will also offer some new challenges for the defense contractor community.

There is really only one reason why we test — to learn. We are trying to fill the data voids in our knowledge about a new piece of equipment or system. The acquisition community (which includes the contractors) needs to know if the system meets contract specifications; and, more important, to know if it will achieve operational requirements. Army and OSD decision-makers need to know if the system is effective, suitable, and survivable before entering full-rate production. And probably the most critical reason we test is to let those responsible for the system's development and procurement know what improvements are still required to provide our soldiers the best possible equipment.

The knowledge we gain through testing is of no benefit if it is confined within the test and evaluation (T&E) community. We have no capability to correct the deficiencies noted in testing. Knowledge is only useful if it is in the hands of those who have both the capability and the authority to use it. The program manager and his or her contractors cannot improve a system without full in-

formation concerning any deficiencies in the design or manufacture of the system. The combat developer cannot develop or correct the tactics, techniques, and procedures (TTP) until the system limitations and problems are clearly articulated. Decision-makers cannot make rational decisions on programs without the knowledge derived from the test arena.

This is the heart of Stoddart's comments. Getting the contractors more closely involved with the T&E organizations will help move the knowledge to where it can be beneficial.

There is another side to this closer tie between the tester and the contractor that should not be ignored. Testers and evaluators cannot do their jobs well unless they really understand the systems they are testing, both at an engineering and an operational level. Closer links with the contractors should improve the base knowledge of the testers and evaluators, allowing them to gain even more insights into the system under test. This can be a true win-win situation.

Stoddart suggests that the contractors need access to the system requirements and T&E planning documents and processes, including the T&E integrated process team (IPT). I couldn't agree more. But, where has the ICOTE been for the past 15 years? In the scores of T&E IPT and TIWG [Testing and Interoperability Working Group] meetings I have attended, it was the exception when contractor representatives were not there, and, in most cases, active participants. There have even been cases where meetings were held in contractor facilities so the T&E IPT members could get a first-hand look at what contractors were doing.

Contractors must understand not just the contract specifications, but also the operational requirements. This means having access to the mission needs statement (MNS), the required operational capabilities (ROC) or operational capabilities document (ORD), the organizational and operational (O&O) concept, and even the critical

operational issues and requirements. They should also see the operation mode summary/mission profile and the test and evaluation master plan (TEMP), and even the test scenarios. Stoddart asked why the PM doesn't just give these documents to the contractors. Not only do we have no objections to giving these documents to the contractors, but we also encourage the contractors to study them very carefully. Ask your PM for these items.

I am encouraged to hear contractors asking for these documents, especially the requirements document. Too often the contractors are totally focused on meeting a contract specification and no more. Yes, they need to meet the specifications, but that is not as important as meeting the operational requirement.

Some contractors seem unaware of what the soldier really needs, or how a system will be used on the battlefield. The only way to understand what you are trying to build is to see it through the eyes of the user. Contractors should have a few ex-soldiers on the team who are fully versed in the O&O concept and system requirements and who are constantly looking at every design decision through a soldier's eyes. If not, the contractor will probably fall short in the system design.

It's easy to make concepts work in the design room or on the proving ground. It's another matter to make them work well in a combat field environment. All contracts for defense systems should have a clause that forbids the contractor to ever use the term *minor annoyance*. What looks like a minor annoyance or minor software glitch in the lab can mean life or death to a young soldier under fire.

Contracts should also include a specification for the system to be user-friendly. And the Department of Defense needs to give more than lip service to this requirement. We need to build systems that are truly user-friendly, especially for combat systems. Commercial airliners have baggage com-

partment doors that close and lock with a simple motion. They stay closed and locked at 500 miles an hour, at 35,000 feet, and at minus zero-degree temperatures. Why can't a piece of Army equipment be as simple to operate and as reliable under similar conditions? I watched a high school graduate install my home satellite dish in 30 minutes. Why does a defense contractor bring a satellite dish to test that requires 138 steps to align? It is time for defense contractors to pay more attention to building effective, suitable, and survivable systems and not just to meeting minimum specifications.

On the issue of access to test plans and scenarios, there is a limit to how far the Army should go in sharing with contractors. This can be compared to giving a student the specific questions that will be on the test. Telling the student that there would be long division problems or questions about Civil War history is not the same as giving them the specific problems or the exact questions. This ensures that the student learns the math techniques and studies the history of the war instead of just memorizing a few answers. Likewise, we do not want a contractor to optimize a system for a specific test. Rather, he or she should be designing to meet the operational requirements.

This one is a bit more difficult. First of all, we agree that there is value in having contractors observe operational tests and even participate in discussions of what we are finding. After all, first-hand observation is often the best way to have the contractor understand the problems that are being uncovered (build the contractor knowledge). Furthermore, the contractor's insights can be invaluable in helping the testers and evaluators understand what they are observing.

Stoddart's suggestions have some problems. There are legal restrictions that he recognizes and accepts. The contractor should not be involved in conducting the test or be in a position to influence the outcome by interacting with the players. Even without the law, this makes a lot of sense.

So, how do we balance the desire to get contractors closer to the action while ensuring that they don't influence the test? This is where I must part from Stoddart's suggestion that the contractor be responsible for policing his or her people at the test site.

The contractor is not an unbiased observer at an operational test. Corporations, including defense contractors, have their first responsibility to their shareholders and boards of directors – not to the American soldier. They can be expected to act in the best interest of their company.

If the contractor is present at an Army operational test site, the tester is responsible to ensure that the law is observed and that the test remains independent and unencumbered. That means placing restrictions, and providing escorts for contractors. We routinely place the same restrictions on PMs visiting operational test sites. They are not given free and unrestricted access to operational tests. Providing an escort for observers on test sites places a burden on the test team and raises the cost of the test. We will pay this price; but, to make this situation workable, the numbers of observers must be limited.

Stoddart suggests that we should allow changes to system hardware and software during the test. Changes occur routinely during developmental testing before the initial operational test and evaluation. For example, the PM and contractor have had the Crusader system under almost constant testing for months. Changes are continuously being applied to the system.

In operational testing, this can present some real problems. Generally, the sample sizes for operational tests are smaller than desired because of test costs. Changing the system in the middle of the test can make the final sample even smaller, thus diminishing the validity of the test. Some system

and software changes are allowable, but only with approval from the Commander of the Operational Test Command, who has configuration control during the operational test. All changes must be thoroughly vetted through a configuration control board to ensure they do not jeopardize the test.

Stoddart suggested that providing feedback during combined developmental testing/operational testing (DT/OT) would allow the contractor to fix problems before the test arrives at the final operational test phase. In principle, I agree that this is a good idea. But, from a practical point of view, if significant problems are found during the test, the contractor is unlikely to be able to fix them in time to affect the test. As a result, we generally discourage combined DT/OT late in a program. Systems coming into an initial operational test and evaluation should provide the tester with the confidence that all technical problems are fixed and that the system is reliable. A contractor should not bring a system into the test arena, hoping it will do well.

The "veil of secrecy" that Stoddart refers to is part myth, part reality. I hope this response helps eliminate some of the myths. We all have to work harder on the reality part. The T&E community will work on opening the doors to contractors and passing on the knowledge learned in testing as quickly as possible. It appears that much of what the ICOTE wants is already available in the Army acquisition community. The operational testers and evaluators are critical to the team effort when fielding new equipment. They serve as a sanity check in the push to deliver the best equipment to the soldier, in the fastest time possible, and at the best cost.

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