

INTERNET DOCUMENT INFORMATION FORM

**A. :Report Title:** Advanced Concept Technology Demonstrations:  
Challenges and Opportunities

**B. DATE Report Downloaded From the Internet** \_18 Mar 98

**C. Report's Point of Contact: (Name, Organization, Address,  
Office Symbol, & Ph #):** The Under Secretary of Defense for  
Acquisition and Technology

**D. Currently Applicable Classification Level:** Unclassified

**E The foregoing information was compiled and provided by:**  
DTIC-OCA, Initials:\_\_\_PM\_\_\_\_\_Preparation Date:18 Mar 98

*DIST- A*

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DTIC QUALITY INSPECTED 4

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**"Advanced Concept Technology Demonstrations:  
Challenges and Opportunities"**

**Keynote Address of  
The Under Secretary of Defense for Acquisition and Technology  
Dr. Paul G. Kaminski**

**ACTD Manager's Conference  
DSMC, Fort Belvoir, VA**

**September 10, 1996**

It's great to be with you. Last Saturday I attended the christening of the Harry S. Truman—CVN-75. President Truman had a simple and direct way of speaking, and when I think about the progress we have made in executing our program of Advanced Concept Technology Demonstrations, I am reminded of the words of Harry Truman who said: "Progress occurs when courageous, skillful leaders seize the opportunity to change things for the better." In three short years, we have come a long way on ACTDs—we together have significantly changed things for the better.

**THEME**

There is more to do and that's why we are here—to exchange our views on what works well; what does not; and what needs fixing. It's my sense that we now have enough collective experience under our belts for you to brag a little to your peers about your achievements. And where things have not turned out so well, we should take this opportunity to swap stories on lessons learned and maybe compare some mutual "scar tissue."

Over the past two fiscal years, we have launched 22 ACTDs that leverage well over \$3.7 billion in Service and Defense Agency investments in core science and technology programs. We are poised to kickoff 18 new ACTDs in fiscal 1997—provided that the Congress acts favorably on our request for a little over \$98 million. These 18 candidate new starts have made the cut from more than 100 proposals submitted by the military services, theater commanders and Joint Staff.

The fiscal 1997 new start list emphasizes information management technologies, system building blocks to counter weapons of mass destruction, and technologies that will enhance small unit capabilities. In each case, there is a relevant—sometimes urgent—military need. . . there are mature, available technologies. . . and the principal unknown is whether there is a suitable concept of operations for fielding an effective operational capability.

We now have a sufficient mass behind our ACTD initiative to begin thinking about how to take advantage of the opportunities that lie ahead and how to meet future challenges.

## OPPORTUNITIES

Let me turn first to the opportunities in front of us. The Department's senior leadership – military and civilian – are committed to fielding equipment that provides superior military capability at an affordable cost. This is our promise to the U.S. warfighter and to the American taxpayer. ACTDs are at the foundation of that promise.

I see ACTDs as creating three opportunities. First, they give us the ability to reduce operational risk early in the acquisition process. Second, they provide us with an approach for compressing acquisition cycle time – the time it takes to develop and field weapon systems. And third, ACTDs are a mechanism for stimulating the innovations needed to implement a revolution in military affairs.

### Reducing Operational Risk

In many cases, the technology associated with a new system or piece of equipment is mature and the technical risk is low, but we do not know how to effectively use it and so the operational risk is high. In order to gain acceptance in the field, the advanced technology must be married with a suitable employment doctrine.

This is one thing that I think has not been given adequate emphasis in the past. We have traditionally underestimated the importance of developing a doctrine for the technologically advanced system, including the tactics for employment, the training, and the people who use it.

When I look back to my own personal experience in the F-117 stealth fighter program, technology deployment – not just technology development – was at the top of our list of priorities. As advanced and significant as the technology was, I think one of the major contributions in that program was the effort undertaken to understand the limitations as well as the strengths of the technology, to develop mission planning tools, and to apply them so that the limitations of the technology were overcome by our operational employment concept.

For years, the Department has emphasized advanced technology development. As we look ahead, our measure of success is not simply developing the best technology or even building the best equipment, but getting this combination in the field and using it wisely. This is why the emphasis in an ACTD is on the operational concept, not the technology.

In many cases, the technology may turn out to be not operationally useful. The demonstration approach is still attractive because, for a modest investment, we would know what the shortcomings are and have a chance to try again. Even in situations where the applications look very promising, getting prototypes into the hands of the user early in the acquisition process gives us an opportunity to factor important operational considerations into subsequent acquisition decisions.

### Compressing Cycle Time

Let me now address compressing cycle time. When an ACTD produces a suitable capability to satisfy a high priority need, we have the option to jump-start our acquisition system and begin, say, at Milestone II rather than at Milestone 0. The great majority of ACTDs will be partially successful – advance knowledge of the operational pitfalls gives us an opportunity to reduce the overall cycle time and field militarily useful systems sooner. In a world where technology is evolving so rapidly, it is hard to overemphasize the importance of making that technology available to the forces in a timely manner.

If the ACTD solution has significant military utility, the residual capability associated with the fielded prototypes is available immediately, as was the case for the Predator deployment to Bosnia in July of 1995. In cases where the operational user is satisfied that the prototype has significant utility, we can immediately provide him with that interim capability and then move quickly to enter the formal acquisition process and acquire quantities to fully satisfy the need. It is important to remember that ACTDs are a pre-acquisition activity. They are not a substitute and certainly not an “end around” for the formal acquisition process.

The typical timeline of two-to-four years for an ACTD is quite compressed compared to normal timelines for fielding an operational capability under the formal acquisition process defined by the DoD 5000 series regulations. These shorter schedules are made possible by a combination of factors. First, ACTDs normally incorporate mature or nearly mature technology and can therefore forgo time consuming technology development and technical risk reduction activities.

Second, performance is the independent variable. In other words, we are demonstrating the capability that is available with current technology and within allocated resources. We are not driving toward a specified performance level. At the end of the ACTD, the user is able to recommend that the capability provided by current technology has sufficient utility to warrant proceeding into Low Rate Initial Production; or if there are significant shortcomings, either pursuing an advanced technology demonstration to improve performance or not pursuing the technology any further at this time.

## Stimulating Innovation

The third opportunity offered by ACTDs is that they are a catalyst for stimulating innovation. This is perhaps the most important opportunity offered by this initiative. For a modest investment, ACTDs provide a low risk vehicle for integrating and evaluating the advanced technologies, unconventional operational concepts, and new organizational structures needed to realize a "revolution in military affairs."

This is critically important because our Department—indeed any large and successful organization—has a lot of institutional barriers to the kind of innovation needed to make revolutionary changes. The most fundamental barrier is what I call the "liability of leadership." What I mean by this term is that when you find a company... including most government institutions and the U.S. defense establishment as well... who have a market-leading product, very rarely do the incentives and mechanisms exist for that company develop a product which displaces its market leading product.

There are institutional barriers to doing that. It's not just in the development laboratories of the companies. It's in the sales force. It permeates the whole infrastructure that brought about the market-leading product. If you take the companies who are the market leaders in vacuum tubes, it probably wouldn't surprise you to learn that none of them became market leaders in semiconductors.

If you look at the development of the mini-computer... IBM had a wonderful position in mainframes at the time... and they failed to capture this market because they weren't about to develop minicomputers to replace their mainframes—so they left a space for companies like Digital Equipment Corporation and SUN Systems.

Now it's very interesting to see that wheel turn over again. The companies who developed the minis, they didn't end up with good positions in the personal computer market. A company like IBM came back and developed the PC in a big way. IBM didn't have an institutional barrier. Nor did a new company like Apple.

The theme that I'm developing here is when you have a system or a capability that is leading and you're comfortable with it... which the American military has today... then it is very difficult to bring along a new capability that will displace the one that you're leading with today. So we have institutional barriers in the Department to the introduction of new approaches and new technology—ACTDs help us break those barriers down.

## CHALLENGES

Earlier, I spoke of challenges facing us, in addition to the opportunities. The ACTD program is continuing to evolve. As it does, we are learning a great deal and we

are refining the process as we go. The conference agenda contains clues to some of those lessons and some of the challenges we anticipate.

This morning I'll briefly highlight three challenges. First, we need to do even more to get the operational test community engaged. Second, we need to plan for smooth transitions of ACTDs to the formal acquisition process. And third, we need to do a better job of getting our message on ACTDs out to the Congress.

### **Involving Operational Testers**

When we talk about evaluating military utility, we are referring to three aspects of the system or capability being evaluated – effectiveness in performing the mission, suitability for use by the troops, and the impact of the system or capability on overall warfighting capability.

Early involvement of operational testers can help us accomplish the first two of these, effectiveness and suitability, in a more disciplined and systematic way and also in a streamlined way. The operational test community has developed considerable expertise and experience in assessing these factors during the execution of defense acquisition programs.

We need to take advantage of that in the planning and execution of ACTDs. That means that the Users who are responsible for assessing military utility in ACTDs should be drawing upon the capability and experience of the OT community. We are already beginning to see that happening on some of the ACTDs. We need to see more! We also need to do a better job of engaging the development test community.

There is a mutual benefit here. By involving the T&E community early in ACTD planning, we help them streamline their processes and we benefit from their experience in return. Phil Coyle and John Burt have given a lot of thought to this. Reach out to them and to the T&E community.

### **Acquisition Transition Planning**

The challenge of involving the test community in ACTD planning and execution is part of a wider challenge – ensuring ACTDs can be smoothly transitioned without delay into the formal acquisition process. Last year, I directed that an integrated product team – a transition IPT – be created to plan for the Predator transition. There were a number of lessons learned from that effort. One of the most significant was that we need to do a better job of structuring ACTDs – from the outset – for seamless transition.

Each ACTD now has a Transition IPT. We are also putting the finishing touches on a set of guidelines – documented in a 24 page white paper – describing how to transition ACTDs into formal DoD 5000 acquisition process. It will be available soon in the Acquisition Deskbook posted on the Internet. ACTDs vary tremendously in terms of scope and complexity and these initial guidelines are geared for Predator-like ACTDs. As more experience is gained, additional guidelines and lessons learned will be made available.

### **Getting the ACTD Message Out**

Our third major challenge is to do a better job in getting our ACTD message across to the Congress – both our past accomplishments and our future opportunities. Until we do this in a coherent and systematic way, we will continue to have problems in getting our full ACTD program authorized and appropriated each year. I am guardedly optimistic that we will have more success this year... and I am pleased to see that Mr. John Young from the Senate Appropriations Committee staff will be addressing you tomorrow.

The ACTD process is still fairly young, but already we are beginning to see the fruits of our efforts. Without question, the Predator ACTD has broken the most new ground. It was initiated in December 1993. The first flight occurred in July of 1994. It deployed to the Balkans in July 1995 to support Operation Deliberate Force and again on March 1 of this year to support Operation Joint Endeavor. Just one week ago, on September 3<sup>rd</sup>, the Air Force's 11<sup>th</sup> Reconnaissance Squadron assumed operational control of the Predator system currently deployed to Taszar, Hungary. On the acquisition side, we are in the process of transitioning to the formal acquisition program to acquire additional systems. Predator is a prime example of quickly responding to a critical need.

The Cruise Missile Defense ACTD, also known as "Mountain Top" was successfully concluded late last year when the Navy and Army demonstrated the concept of using data from an elevated sensor to conduct beyond the horizon engagements of low altitude cruise missiles.

The Low Life Cycle Cost Medium Lift Helicopter ACTD was unusual – even for an ACTD. It evaluated the military utility of a commercial alternative to the UH 46 helicopter capability used to move supplies from Military Sealift Command ships to Navy ships. The ACTD showed that a much lower cost commercial alternative is a viable approach to meeting a significant portion of the lift requirements.

## SUMMARY

In summary, the Department's ACTD initiative is continuing to build momentum and providing us with at least three significant opportunities.

- First, ACTDs provide experienced combat commanders with an opportunity to develop operational concepts that address military needs prior to major acquisition decisions and large dollar commitments.
- Second, they provide the Services with an approach for compressing acquisition cycle time and for offering direct and immediate solutions to urgent theater needs.
- And third, they provide the Department of Defense with a mechanism for fostering the kind of innovation needed to confront the wide range of military missions and potential threats confronting the U.S. today and in the future.

There are still some significant challenges in front of us. We need to better engage the operational test community. We need to improve our process for smoothly transitioning ACTDs to the formal acquisition process. And we need to do a much better job of getting our ACTD message to the Congress.

We are learning as we go. It is the reason why we have brought all of you together. We are looking to you for a critical review of the progress made on ACTDs and to identify where we need to make adjustments and place more emphasis.

I solicit your active involvement in the sessions that will take place over the next two days. Your active participation and insights are vital—not only to the success of this conference—but, as Harry Truman put it, “to seize the opportunity to change things for the better.”

Thank you all.