Acquisition Transformation — Technology Transfer Programs and Advanced Concept Technology Demonstrations

MAJ Robert F. Mortlock

DoD Directive 5000.1 states that flexibility, responsiveness and innovation shall govern the Defense Acquisition System. Both *DoD Directive 5000.1* and *DoD Instruction 5000.2* provide program managers (PMs) direction for an acquisition policy that fosters efficiency, creativity and innovation by giving PMs intent-based guidance. Army transformation and current operations' pace and intensity have driven the need for a more responsive acquisition process. Further, the ability to leverage mature technologies to rapidly meet critical warfighting requirements with effective, suitable, supportable and affordable materiel solutions remains central to Army acquisition transformation. One way to eliminate urgent warfighting capability gaps is through rapid prototyping and demonstration programs such as Advanced Concept Technology Demonstrations (ACTDs).

Redstone Technical Test Center (RTTC) Test Engineer Donya Jefferys and Joint Common Missile (JCM) Project Office/Aviation and Missile Research, Development and Engineering Center (AMRDEC) Warhead and Propulsion Engineer Chuck Allen explain a tandem warhead sled test to the author at RTTC, Test Area 1, Redstone Arsenal. (U.S. Army photo.)

ACTDs remain critical to transforming the acquisition process. Establishing program executive office (PEO)-level technology transfer programs (TTPs) with DA centrally selected PMs to manage ACTDs would support evolutionary acquisition strategies, provide seamless transition of technology to formal acquisition programs, support a more effective requirements-generation process and facilitate the use of demonstration results in the area of testing.

The science and technology (S&T) community currently performs basic research, applied research and advanced technology development (ATD). As part of ATD, it also manages ACTDs. ACTDs accelerate the fielding of mature technologies in response to critical military operational needs and provide a military utility evaluation of proposed technology materiel solutions. ACTDs do not develop technologies; they use mature technologies to demonstrate military utility. Fielding an initial, limited, residual capability to the sponsoring unified combatant commander (UCC) and transitioning demonstration technology to a formal acquisition program are ACTD goals. S&T programs provide ACTD managers — who are responsible for planning, coordinating and directing all ACTD-related development activities — with an ACTD operational manager from the UCC.

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Managing PEO Responsibilities

ACTDs offer a critical means to effectively transfer technology from the S&T community to a formal acquisition program within the PEO for system integration, demonstration, procurement and fielding. ACTDs also provide the foundation for successful formal programs that rely on prototyping and demonstration. The importance of ACTDs to rapid acquisition strategies requires transfer of the management responsibility from engineers in the S&T community to PMs in the acquisition community.

ACTD management requires acquisition expertise in program management, testing and demonstration, systems engineering management, integrated logistics management and integrated product and process development through integrated product teams (IPTs). PEOs have acquisition-certified, centrally selected PMs with generally more program management expertise than S&T engineers.

Early in the ACTD, PMs could emphasize the critical areas of affordability, training, supportability and life-cycle management — areas in which S&T engineers typically lack experience or expertise. PM management and PEO oversight of ACTDs would solidify the "cradle-to-grave" mandate for the acquisition community by giving PEOs management responsibility over pre-system development and demonstration (SDD) activities that feed formal acquisition programs but do not require technology maturation. PEO management oversight of both the ACTD and follow-on acquisition program supports synchronization of efforts through economies of scope and the seamless ACTD transition into a formal acquisition program.

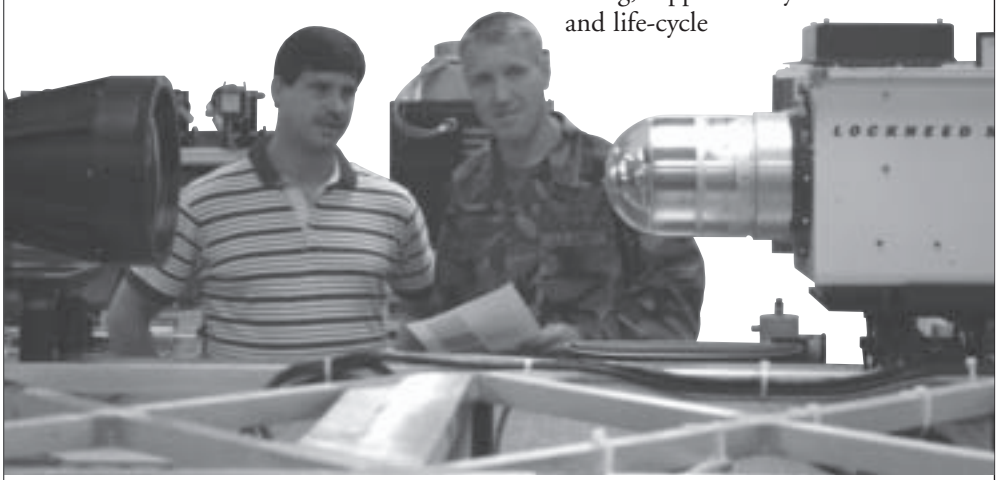
PEO Funding Control

In addition to ACTD management transfer, PEOs need to control demonstration-related funding in the 6.3/6.4 areas. Control of this funding allows PEOs to establish efficient TTPs, which provide the technical foundation for programs by facilitating the transition of mature and demonstrated technologies with significant military utility.

Currently, PEOs are not funded to establish effective TTPs. PEO TTPs promote rapid acquisition by transitioning demonstrated technologies at the appropriate times based on technology maturity, approved user requirements and adequate funding. The single PEO management of ACTD funding would give the PEO management flexibility and ensure that several project offices benefit from the ACTD. S&T programs could continue to focus on meeting S&T objectives with basic research, applied research and ATD programs. The PEO TTPs would manage ACTDs, providing a direct link to follow-on acquisition programs and easing transition difficulties. PEO management of ACTD funding through TTPs provides flexibility for PEOs to effectively meet both urgent UCC warfighting needs with an initial capability and service-approved requirements with full acquisition programs.

Promoting Evolutionary Acquisition

By managing responsibilities and funding controls, PEOs could take full advantage of ACTD benefits. The first benefit includes supporting evolutionary



AMRDEC Hardware-in-the-Loop Engineer Joe Morris (left) and the author discuss imaging infrared confidence testing taking place at Redstone Arsenal. (U.S. Army photo.)

acquisition strategies and spiral development. Evolutionary acquisition involves the rapid development and fielding of mature technologies to the user to achieve desired capability increments over time. PMs can emphasize affordability, modular design concepts and logistics supportability early in the ACTD process, greatly benefiting evolutionary acquisition approaches in the follow-on formal programs.

Spiral development relies heavily on horizontal technology integration and commercial-off-the-shelf technologies to meet time-phased requirements. ACTDs remain central to the successful spiral development of equipment by providing user military utility assessments (MUAs). PMs could ensure that the ACTD MUA affects the system design early in the process before the changes become economically unaffordable. With a heavy reliance on ACTDs to shorten acquisition life-cycle development times and decrease costs, PEO ACTD management through TTPs with PMs ensures that demonstration technologies focus on areas that have the most impact on schedule and cost such as testing and requirements generation.

In addition to supporting evolutionary acquisition, PEO TTP management of ACTDs through PMs promotes a more effective requirements generation process by starting the requirements documentation process for the capability development document early enough to support a Milestone B decision to enter SDD. PMs from PEOs lead IPTs that integrate the acquisition and requirements communities for formal acquisition programs. PEO TTPs can leverage this experience and ensure the continuity between the ACTD and follow-on program requirement documents. PMs can ensure that the ACTD supports the establishment of time-phased requirements by providing scarce MUA data and operational test data for input into the user community requirements generation documents such as mission area analyses and alternative analyses.

Integrating T&E Programs

In the same way that PEO TTP management of ACTDs through PMs improves requirement generation, PEO TTPs facilitate integrated test and evaluation (T&E). PMs ensure that systems are operationally effective, suitable, supportable and survivable for their intended use, and are more prone to involve Soldiers than S & T engineers in the testing process. PMs can leverage development-testing data to help focus operational tests on examining employment concepts.

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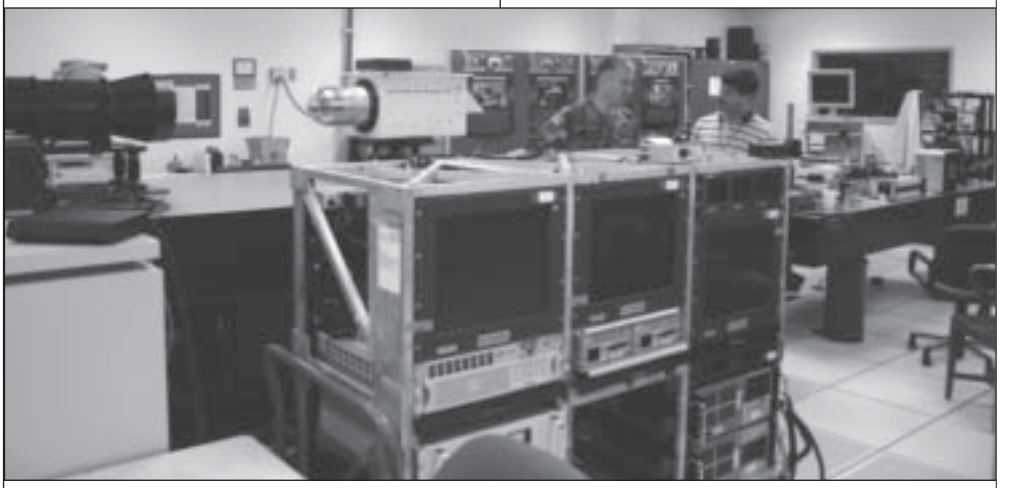
The ACTD MUA provides development test data and feedback for employment concepts. PEO TTP management of ACTDs facilitates using ACTD MUA results in the follow-on program T&E master plan by ensuring direct communication and data sharing between the ACTD and the follow-on acquisition program. Because the PEO would have oversight over both efforts, testing costs and fielding times would be reduced by leveraging early user testing.

Army transformation requires materiel acquisition transformation. The pace of technology advances and the demand for a more responsive acquisition system requires a heavy reliance on ACTDs to shorten acquisition schedules, reduce risk, decrease costs and still develop and field effective equipment. Establishing PEO TTPs with PMs to manage ACTDs ensures synchronization of work efforts, promotes communication and data sharing and eases technology transition difficulties between ACTDs and follow-on formal acquisition programs. PEO ACTD management through TTPs and PMs promotes evolutionary acquisition strategies, improves the requirements generation process and leverages operational testing early in the development process. PEO ACTD management supports the emphasis on "cradle-to-grave" life-cycle management for the acquisition community and supports acquisition transformation by accelerating acquisition schedules and reducing program risks.



Morris (right) explains current imaging infrared confidence test results to the author. The testing is being conducted at an AMRDEC laboratory with a Lockheed Martin JCM prototype seeker. (U.S. Army photo.)

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