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June 2005

DEFENSE TECHNOLOGY DEVELOPMENT

Management Process Can Be Strengthened for New Technology Transition Programs

GAO-05-480

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Highlights

Highlights of GAO-05-480, a report to Congressional Committees

Why GAO Did This Study

The Department of Defense (DOD) and Congress both recognize that Defense technology innovations sometimes move too slowly from the lab to the field. Three new programs have been recently created in DOD to help speed and enhance the transition of new technologies. A report accompanying the fiscal year 2003 National Defense Authorization Act required GAO to review two of these programs—the Technology Transition Initiative (TTI) and Defense Acquisition Challenge Program (DACP). The first is designed to speed transition of technologies from DOD labs to acquisition programs and the second is designed to introduce cost-saving technologies from inside and outside DOD. We were also asked to review the Quick Reaction Fund, which is focused on rapidly field testing promising new technology prototypes. We assessed the impact the programs had on technology transition and the programs' selection, management and oversight, and assessment practices.

What GAO Recommends

GAO recommends that DOD develop data and measures that can be used to assess short- and long-term impacts of the programs and take other actions to strengthen selection, management and oversight. DOD agreed with our recommendations as they related to the DACP and TTI programs, but does not believe they apply to the Quick Reaction Fund program.

www.gao.gov/cgi-bin/getrpt?GAO-05-480.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Mike Sullivan at (937) 258-7915 or sullivanm@gao.gov.

What GAO Found

The ability to spur and leverage technological advances is vital to sustaining DOD's ability to maintain its superiority over others and to improve and even transform how military operations are conducted. The three new transition programs we reviewed are all appropriately targeted on what has been a critical problem in this regard—quickly moving promising technologies from the laboratory and commercial environment into actual use. Moreover, by tailoring processes and criteria to focus on different objectives, whether that may be saving time or money or broadening the industrial base, DOD has had an opportunity to experiment with a variety of management approaches and criteria that can be used to help solve transition problems affecting the approximately $69 billion spent over the past 3 years on later stages of technology development.

However, it is too soon for us to determine the impact the three new DOD technology transition programs are having. At the time of our review, the programs—the TTI, DACP, and Quick Reaction Fund—had completed only 11 of 68 projects funded in fiscal years 2003 and 2004; of those, only 4 were providing full capability to users. Additionally, the programs have limited measures to gauge success of individual projects and return on investment. Nonetheless, reports from the programs have pointed to an array of benefits, including quicker fielding of technological improvements, cost savings, and the opportunity for DOD to tap into innovative technologies from firms that are new to defense work. Some sponsored technologies are bringing benefits to warfighters, such as a small, unmanned aircraft that can detect chemical and biological agents, and a device the size of an ink pen that can be used to purify water on the battlefield or in disaster areas. Furthermore, DOD officials credit the programs with giving senior leaders the flexibility to rapidly address current warfighter needs and for highlighting smaller technology projects that might otherwise be ignored.

Long-term success for the programs likely will depend on how well the programs are managed and overseen. The programs must have effective processes for selecting the best projects, and management and oversight processes that will catch potential problems early. Thus far, of the three programs, the DACP has adopted the most disciplined and structured process for selecting and managing projects, and has encountered few problems managing projects. However, the program has had some difficulties processing the large number of proposals it receives. The TTI has also established selection criteria and processes, but it is unclear the extent to which it is reaching its intended audience and has had less success in tracking its projects. The Quick Reaction Fund has the least structured processes of the three programs—a deliberate approach seen as providing the flexibility needed to field innovations rapidly. It has had some difficulty selecting, managing and tracking projects.

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Abbreviations

ACTD	Advanced Concept Technology Demonstration
DACP	Defense Acquisition Challenge Program
DARPA	Defense Advanced Research Projects Agency
DOD	Department of Defense
FCT	Foreign Comparative Testing
MANTECH	Manufacturing Technology Program
S&T	science and technology
TRL	technology readiness level
TTI	Technology Transition Initiative

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United States Government Accountability Office
Washington, DC 20548

June 17, 2005

The Honorable John Warner
Chairman
The Honorable Carl Levin
Ranking Minority Member
Committee on Armed Services
United States Senate

The Honorable Duncan L. Hunter
Chairman
The Honorable Ike Skelton
Ranking Minority Member
Committee on Armed Services
House of Representatives

Over the past 3 years, the Department of Defense (DOD) has invested almost $69 billion[1] on a wide range of advanced technology development projects—from detecting and neutralizing deeply buried facilities that protect weapons of mass destruction, to miniaturizing power and energy technologies to reduce the weight of gear soldiers carry into battle, to improving access to space. As we have previously reported, the majority of these dollars are spent within large weapons programs that have taken too long to get to the warfighter, in large part because these programs often attempt to incorporate technology advances that have not been proven. Invariably, this practice has resulted not only in large cost and schedule increases for large programs, but less available funding and commitment for small-scale development.

Both DOD and Congress recognize these as well as other problems in transitioning technology and have initiated a number of programs over the past decade aimed at spurring and fielding smaller-scale technology advances. Recently, the fiscal year 2003 National Defense Authorization Act[2] required DOD to establish two new programs, the Technology

[1] This represents funding for applied research, advanced technology development projects, and advanced component and development prototypes. It does not include basic research.

[2] Bob Stump National Defense Authorization Act for Fiscal Year 2003, P.L. 107-314, §§ 242 and 243, Dec. 2, 2002.

Transition Initiative (TTI) and the Defense Acquisition Challenge Program (DACP)—the first designed to speed transition of technologies from DOD's science and technology (S&T) programs to acquisition programs and the second designed to introduce innovative and cost-saving technologies from inside and outside DOD. In addition, DOD established the Quick Reaction Fund to rapidly field-test promising new technology prototypes. All three programs target relatively small-scale projects and their total combined annual budget is about $64 million in fiscal year 2005—a very small portion of the overall dollars dedicated to technology research and development. We were required by the conference report accompanying the act to assess the implementation of the first two programs and were later asked by your offices to also review the Quick Reaction Fund. As discussed with your offices, our specific objectives were to assess (1) the impact the programs have had on technology transition and (2) practices that have helped or hindered the selection, management and oversight, and assessment of the programs.

In conducting our work, we interviewed the managers of the three programs we reviewed and analyzed documents that detailed how the programs have been implemented, expected project benefits, and the types of performance metrics they used to gauge individual project and overall program success. We met with several high-level DOD officials who were appointed to a council to oversee the Technology Transition Initiative, and we observed meetings of a working group in charge of supporting the same initiative. In addition, we judgmentally selected 24 of 68 projects funded by the three transition programs for more in-depth review, targeting those that had already been completed or were in the completion stages as well as assuring we had projects representing all of the military services and key Defense agencies. We conducted interviews with the managers of these 24 projects to discuss implementation, management, and oversight activities. We analyzed pertinent project documents, including original proposals and quarterly status reports. We also analyzed documents relating to the transition programs as well as broader transition issues and conducted interviews with officials in DOD, the Army, the Navy, the Air Force, the Marine Corps, the Defense Advanced Research Projects Agency, the Missile Defense Agency, the Defense Threat Reduction Agency, Defense Information Systems Agency, Special Operations Command, Joint Chiefs of Staff, and military department research laboratories. We relied on our previous best practices work, other transition program guidance, and general management practices as criteria when assessing the program offices' efforts to select, manage and oversee, and assess projects. We also analyzed DOD budget documents to identify program funding, as well as

applied research and advanced technology development funding for fiscal years 2003 to 2009 and confirmed with DOD officials responsible for maintaining this information that our analysis was correct. Our review was conducted from June 2004 to April 2005 in accordance with generally accepted government auditing standards.

Results in Brief

It is too soon for us to determine the impact the three programs are having on technology transition within DOD because, at the time we selected projects for review, only 11of the 68 projects that were funded in fiscal years 2003 and 2004 had been completed, and, of those, only 4 were actually providing full capability to users. Moreover, the three transition programs have limited measures to gauge individual project success and return on investment. However, the Technology Transition Initiative and the Defense Acquisition Challenge Program, which are being implemented consistent with congressional intent and the Quick Reaction Fund are expected to result in several benefits. For example, each tout benefits such as quicker fielding of new or improved technologies, cost savings, and in the case of the Defense Acquisition Challenge Program, the opportunity for DOD to use new, innovative technologies from smaller firms and companies that have not done business with DOD in the past. In addition, some sponsored technologies are providing valued capabilities, such as the ability to detect chemical and biological agents via small unmanned aircraft and new ways of purifying water on the battlefield or disaster zones. DOD officials also believe the programs are worthwhile from the standpoint of giving senior leaders the flexibility to rapidly address current warfighter needs and by providing visibility for smaller technology projects that may not be high enough on an acquisition program's priority list to receive funding. As a result, DOD plans to increase funding collectively for these programs from about $24 million in fiscal year 2003 to about $94 million by fiscal year 2009.

Whether the three programs will be successful over the long run will likely hinge on how well they are managed and overseen, particularly if DOD's investment increases as planned. Specifically, it will be important for the programs to have effective processes for selecting projects, to ensure that the best possible candidates are chosen and that the technologies themselves are ready for final testing and evaluation stages. It will also be vital that they instill effective management and oversight processes, so that they can identify and correct problems before they throw projects off track and so that they can sustain acquisition program commitment. In addition, given the importance of enhancing technology transition within DOD and the expectation that the investment in these programs will grow,

it will be important for all three programs to demonstrate to others that they are providing a worthwhile return on investment. To date, the DACP has adopted a fairly disciplined and structured process for selecting and managing projects. While its selection process has been slowed due to an overwhelming response and it has not yet completed a project, the program has encountered few problems in managing projects. The TTI has also established criteria and processes, but had less success in marketing the program and in tracking progress of individual projects. The Quick Reaction Fund had the least structured process and criteria, believing that a high degree of flexibility is needed in order to get technology prototypes quickly out to the field, where they can immediately impact military operations. At the same time, it had some difficulty in selecting, managing, and tracking the status of projects.

All three programs are continuing to strengthen their management processes. This report recommends that DOD develop data and measures that can be used to assess short- and long-term impacts of the programs and take other actions, as appropriate, to further strengthen selection, management, and oversight as investments increase. DOD agreed with our recommendations as they related to the DACP and TTI programs. However, since the Quick Reaction Fund is meant to quickly test a new technology, DOD did not believe the recommendations should apply to that program.

Background

DOD relies on its research laboratories and test facilities as well as industry and academia to develop new technologies and systems that improve and enhance military operations and ensure technological superiority over adversaries. Yet, historically, DOD has experienced problems in bringing technologies out of the lab environment and into real use. At times, technologies do not leave the lab because their potential has not been adequately demonstrated or recognized. In other cases, acquisition programs—which receive the bulk of DOD's funding in research, development, testing and evaluation of technology—are simply unwilling to fund final stages of development of a promising technology, preferring to invest in other aspects of the program that are viewed as more vital to success. Other times, they choose to develop the technologies themselves, rather than rely on DOD labs to do so—a practice that brings cost and schedule risk since programs may well find themselves addressing problems related to technology immaturity that hamper other aspects of the acquisition process. And often, DOD's budgeting process, which requires investments to be targeted at least 2 years in advance of their activation, makes it difficult for DOD to seize

opportunities to introduce technological advances into acquisition programs. In addition, it is challenging just to identify and pursue technologies that could be used to enhance military operations given the very wide range of organizations inside and outside of DOD that are focused on technology development and the wide range of capabilities that DOD is interested in advancing.

In recognizing this array of challenges, DOD and Congress have established a number of "technology transition" programs, each with a particular focus. (See table 1.) The Advanced Concept Technology Demonstration (ACTD) program, for example, was initiated by DOD in 1994 as a way to get technologies that meet critical military needs into the hands of users faster and at less cost than the traditional acquisition process. Under this program, military operators test prototypes that have already been developed and matured in realistic settings. If they find the items to have military utility, DOD may choose to buy additional quantities or just use the items remaining after the demonstration. In 1980, DOD established the Foreign Comparative Testing (FCT) Program to identify, evaluate, and procure technologies that have already been developed and tested in other countries—saving DOD the costly burden of maturing the technology itself. Other programs include those that seek to quickly identify and solve production problems associated with technology transition (the Manufacturing Technology Program—MANTECH) and to partner with the commercial sector in completing projects that are useful to both military and industry (the Dual Use Science and Technology program). Even taken together, however, these programs represent a very small portion of DOD dollars spent on applied research and advanced technology development—about $9 billion annually—and considerably less of total money spent on the later stages of technology development, which includes an additional $60 billion spent on advanced component development and prototypes, largely within weapons acquisition programs. As such, they cannot single-handedly overcome transition problems, but rather demonstrate various ways to ease transition and broaden participation from the industrial base.

Table 1: The Office of the Secretary of Defense Sponsored Technology Transition Programs

Program	Purpose	Fiscal year 2004 funding
Manufacturing Technology (MANTECH) Program	Mature and validate emerging manufacturing technologies to facilitate production of new affordable and sustainable technologies	$256 million
Advanced Concept Technology Demonstration (ACTD)	Expedite the transition of maturing technologies from the developers to the users by having military operators and users test technology prototypes	223 million
Defense Production Act Title III Program	Create, maintain, modernize, or expand the productive capacities of domestic sources for critical components, technology items and industrial resources essential for national defense.	78 million
Foreign Comparative Testing (FCT) Program	Identify, test, and evaluate mature foreign technologies that DOD can adopt rather than having to sponsor development itself	34 million
Defense Acquisition Challenge Program (DACP)	Identify and introduce innovative and cost-saving technology or products from within DOD's science and technology community as well as externally into existing DOD acquisition programs	17 million
Quick Reaction Fund	Identify and rapidly field-test promising new technologies within DOD's budget execution years	15 million
Technology Transition Initiative (TTI)	Facilitate the rapid transition of new technologies from DOD science and technology programs into acquisition programs	13 million
Joint Advanced Warfighting Program	Assist in developing the capabilities envisioned in Joint Vision 2010 by leveraging advanced technology, innovative operational concepts, and new organizational structures	10 million
Dual Use Science and Technology	Partner with industry to jointly fund the development of dual use technologies needed to maintain technological superiority on the battlefield	0[a]
Tech Link	Mission is threefold: (1) integrate advanced commercial-sector technologies into DOD systems, particularly from nontraditional defense contractors; (2) spin-off DOD-developed technologies to the commercial sector to make these technologies more affordable for military acquisition; and (3) establish collaborative research and development projects with the private sector for cost-sharing of new dual-use technology development	3 million
Independent Research and Development	Increase efficiency and productivity of contractor independent research and development activities	0[b]

Source: DOD.

[a]The Air Force provided $10 million for Dual Use Science and Technology projects in fiscal year 2004.

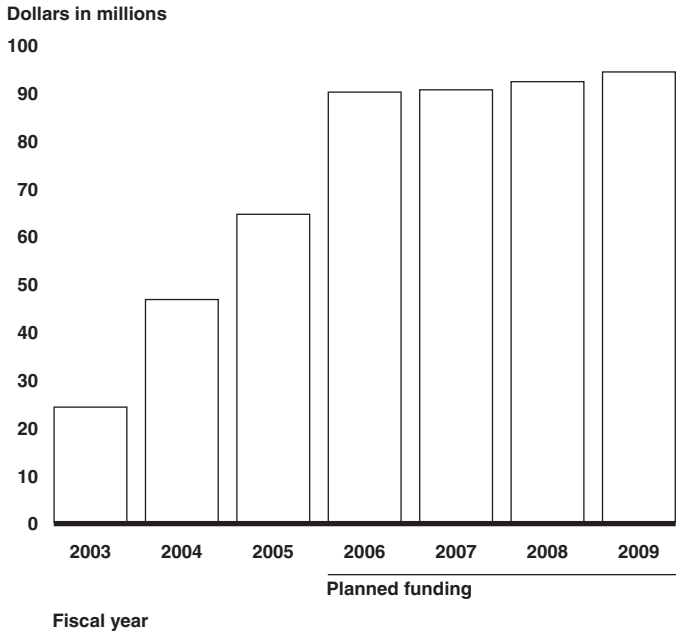
[b]OSD does not spend any money on this program. Rather, DOD compiles data on the amount of independent research and development spending by major defense contractors and reports this information annually.

Three of the more recent initiatives include the TTI and DACP, both established by Congress in fiscal year 2003, and the Quick Reaction Fund, established by DOD the same year. TTI is focused on speeding the transition of technologies developed by DOD's S&T programs into acquisition programs, while DACP is focused on introducing innovative and cost-saving technologies developed inside and outside DOD. The Quick Reaction Fund is focused on field testing technology prototypes.

All three programs are managed by DOD's Office of Defense Research and Engineering, which reports to the Under Secretary of Defense for Acquisition, Technology and Logistics.

Together, these three programs received about $64 million in fiscal year 2005–a fraction of the $9.2 billion DOD invested in applied research and advanced technology development the same year and a relatively small budget compared to some of the other transition programs. Nevertheless, DOD has been increasing its investment in these programs and plans to further increase it over the next few years. (See figure 1.)

Figure 1: Funding for TTI, DACP, and Quick Reaction Fund



Source: DOD.

Table 2 highlights similarities and differences between DACP, TTI, and Quick Reaction Fund. Table 3 provides examples of projects that have already been funded.

Table 2: Technology Transition Programs

Program	Objective	Scope	Completion time frames	Total fiscal year 2003 and 2004 funding	Projects funded to date
DACP	Introduce innovative and cost-saving technologies or products into existing acquisition programs Other objectives of the program include expansion of opportunities for emerging defense suppliers and widening the U.S. defense industrial base	Any person or activity inside or outside DOD	Up to 3 years; 12 to 24 months is preferred	$29.83 million	30 projects ranging in value from $100,000 to $2.54 million
TTI	Speed transition of technologies from DOD science and technology programs to acquisition programs	DOD science and technology programs	Up to 4 years; up to 24 months is preferred	$19.27 million	21 projects ranging from $323,000 to $5.33 million
Quick Reaction Fund	Field and test prototypes that respond to immediate and emerging warfighter needs	DOD science and technology programs	6 to 12 months	$21.54 million	17 projects ranging from $240,000 to $3.5 million

Source: DOD.

Table 3: Examples of Projects

DACP	TTI	Quick Reaction Fund
• A collapsible stock for the M-4 rifle that makes it more effective in an urban environment and ergonomic • An enhanced optics system for the Rolling Airframe Missile that will permit all-weather operational capability • A new process for repairing titanium cracks in the B-2 aircraft that will improve mission readiness rates and has the potential to save DOD millions of dollars in replacement costs • A new welding process for naval propellers that will improve weld repair techniques and increase the strength and quality of the casting in repaired areas	• An ink-pen size device that purifies water • A custom-design earplug that provides blast noise protection and increased communication capabilities • A low-cost, flame resistant coverall for infantry soldiers • A new coating for H-46 helicopter engine blades that reduces the rate of premature engine removals related to desert operations • Extending the field of view for a sensor targeting system that is capable of detecting, classifying, and locating weapons firing in real time	• A greaseless M-4 rifle that is more suitable for desert operations • A special material that strengthens the physical structure of an unmanned aerial vehicle • A chemical and biological detection capability for small unmanned aerial vehicle • An accuracy enhancement for unguided rockets

Source: DOD.

Technology Transition Programs Offering Benefits, but It Is too Early to Determine Their Impact

The three transition programs, which are being implemented consistent with congressional intent, reported that benefits can already be seen in many projects, including improvements to performance, affordability, manufacturability, and operational capability for the warfighter. While such benefits may have eventually been achieved through normal processes, program officials believe the three transition programs enabled DOD to realize them sooner due to the immediate funding that was provided to complete testing and evaluation as well as attention received from senior managers. DOD officials also emphasized that these programs are calling attention to emerging technologies that have the potential to offer important performance gains and cost savings but, due to their size and relative obscurity, may otherwise be overlooked when competing against other, larger-scaled technologies and/or technologies already deemed as vital to a particular acquisition program's success. Another benefit cited with the DACP is an expansion of the Defense industrial base, because the program invites participation from companies and individuals that have not been traditional business partners with DOD. Nevertheless, it is too early for us to determine the impact that these programs have had on technology transition. At the time we selected projects to review, few projects had been completed. In addition, the programs had limited performance measures to gauge success of individual projects or track return on investment over time.

The following examples highlight some of the reported benefits of individual projects.

- Host Weapons Shock Profile Database—DOD spends a significant amount of time and resources to test new accessories (e.g., night vision scopes) for Special Operations Forces weapons. Currently, when new accessories are added, they must go through live fire testing to determine if they work properly and will meet reliability standards. This process could take several months to complete as the acquisition office must schedule time at a test range to complete the testing. Program officials must also identify and pay for an expert to conduct the testing and pay for ammunition that will be used in the test. The DACP is funding the test and evaluation of a database that will simulate the vibration or shock of various machine guns in order to test new accessories for that gun. This will eliminate almost all of the testing costs mentioned above and greatly reduce the amount of time needed for testing. The project office estimates that it will save almost $780,000 per year in ammunition costs alone.

- Enhanced Optics for the Rolling Airframe Missile—The Rolling Airframe Missile is part of the Navy's ship self-defense system to counter attacks from missiles and aircraft. However, the missile experiences operational deficiencies in certain weather conditions, and the program has had problems producing components for the optics. The DACP is providing funding to a small business to test and evaluate a new sapphire dome and optics for the missile to resolve these problems. Program officials estimate that program funding will accelerate the development of a solution 1 to 2 years earlier than anticipated. If the DACP project is successful, an added benefit will be that the dome material will be readily available from manufacturers in the United States instead of a single overseas supplier, as is currently the case.

Figure 2: RAM Optic Assembly and Missile Launch

Source: Raytheon Missile Systems.

Source: Raytheon Missile Systems.

- Water Purification System— For tactical situations in which deployed troops do not have quick and easy access to potable water, the pen will allow soldiers to treat up to 300 liters of any available, non-brackish water source on one set of lithium camera batteries and common table salt. The pen eliminates the risk of the soldiers' exposure to diseases and bio-chemical pollutants. TTI funding was used to purchase approximately 6,600 water pens for distribution to the military services. In addition, TTI funding enabled this item to be placed on a General

Services Administration schedule, where approximately 8,600 additional water pens have been purchased by DOD customers. DOD and the company that produces the pen donated hundreds of these systems to the tsunami relief effort in Southeast Asia.

Figure 3: DARPA Water Purification System

Source: Defense Advanced Research Projects Agency.

- Dragon Eye—The Dragon Eye is a small, unmanned aerial vehicle with video surveillance capabilities used by the marines. To address the concerns over a chemical and biological threat to troops in Iraq, the Quick Reaction Fund funded the integration of a small chemical detection and biological collection device on the Dragon Eye. The low-flying Dragon Eye can tell troops in real time where and when it is collecting samples, and in cases where a plume is detected, it can determine the direction the plume is moving. According to program officials, Quick Reaction funding allowed the chemical and biological detection capability to be developed 2 years ahead of schedule. The technology was available to a limited number of Special Operations Forces at the beginning of the Iraqi conflict.

Despite the evident benefits of certain projects, it is too early to determine the programs' impact on technology transition. At the time we selected projects for review, only 11 of 68 projects started in fiscal years 2003 and 2004 had been completed, and, of those, only 4 were currently available to warfighters. These include one TTI project—a miniaturized water purification system that is now being offered through a General Services Administration schedule to the warfighter—and three projects under the Quick Reaction Fund, including the Dragon Eye chemical and biological sensor, planning software used by Combatant Commanders dealing with weapons of mass destruction targets, and special materials that strengthen unmanned aerial vehicles.

Since the time we selected projects, 20 have been reported as completed and 13 have been reported as available to warfighters. The latest project completion information by program is shown in Table 4.

Table 4: Projects Completed

Program	Projects funded since the program began	Projects completed as of 2/28/2005
TTI	21	11
DACP	30	0
Quick Reaction Program	17	9
Total	**68**	**20**

Source: DOD.

It is important to note that, even though 20 TTI and Quick Reaction Fund projects are considered to be complete, not all of the capabilities have reached the warfighter. For example:

- The T58 Titanium Nitride Erosion Protection is a TTI project that has transitioned to an acquisition program but has not yet reached the warfighter. The project is being developed to improve the reliability of T-58-16A helicopter engines used in Iraq. While the compressor blades are designed for 3000 operating hours, the Marine Corps has had to remove engines with fewer than 150 operational hours due to sand ingestion. The project received funding from the TTI in fiscal years 2003 and 2004 to develop a titanium nitride coating for engine blades that would significantly mitigate erosion problems in a desert environment. According to program documents, blades with the new coating will be included in future production lots beginning in July 2005. Modification kits will also be developed for retrofitting engines already produced. Program officials expect the project will double the

compressor life of the engine in a sand environment and save about $12 million in life-cycle costs through fiscal year 2012.

- The Ping project, funded by the Quick Reaction Fund, is an example of a project that is considered complete, but a prototype was never field tested by the warfighter. The Air Force had hoped to broaden the capability of the microwave technology it used to identify large objects such as tanks or cars to also detect concealed weapons or explosives—such as suicide vests. However, the project was cancelled after some initial testing revealed that the technology was not accurate enough to determine the microwave signatures of small arms or suicide vests that could have numerous configurations and materials. DOD officials stated that, even though the project was unsuccessful, they gained a better understanding of microwave technologies and are continuing to develop these technologies for other applications.

The long-term impact of the programs will also be difficult to determine because the technology transition programs have a limited set of metrics to gauge project success or the impact of program funding over time. While each funded project had to identify potential impact in terms of dollar savings, performance improvements, or acceleration to the field as part of the proposal process, actual impact of specific projects as well as the transition programs as a whole is not being tracked consistently. The value of having performance measures as well as DOD's progress in adopting them for these transition programs is discussed in the next section of this report.

Selection, Management and Oversight, and Assessment Processes Could Be Improved by Adopting Additional Practices

To ensure that new technologies can be effectively transitioned and integrated into acquisitions, transition programs need to establish effective selection, management and oversight, and assessment processes. For example, programs must assure that proposals being accepted have established a sound business case, that is, technologies being transitioned are fairly mature and in demand and schedules and cost for transition fit within the program's criteria. Once projects are selected, there needs to be continual and effective communication between labs and acquisition programs so that commitment can be sustained even when problems arise. To assure that the return on investment is being maximized, the impact of programs must be tracked, including cost and time savings as well as performance enhancements. Our work over the past 7 years has found that high-performing organizations adopt these basic practices as a means for successfully transitioning technologies into acquisitions. Moreover, several larger DOD technology transition programs, such as the ACTD program

and some Defense Advanced Research Projects Agency (DARPA) projects, embrace similar practices and have already developed tools to help sustain commitment, such as memorandums of agreement between technology developers and acquirers. Both DARPA and ACTD manage budgets that are considerably larger than the programs included in this review. As such, the level of detail and rigor associated with their management processes may not be appropriate for TTI, DACP, or Quick Reaction Fund. However, the concepts and basic ingredients of their criteria and guidance could serve as a useful starting point for the smaller programs to strengthen their own processes.

The three programs we reviewed adopted these practices to varying degrees. Overall, the DACP had disciplined and well-defined processes for selecting and managing, and overseeing projects. The TTI had disciplined and well-defined processes for selecting projects, but less formal processes for management and oversight. The Quick Reaction Fund was the least formal and disciplined of all three, believing that success was being achieved through flexibility and a high degree of senior management attention. All three programs had limited performance measures to gauge progress and return on investment. Generally, we found that the more the programs adopted structured and disciplined management processes, the fewer problems they encountered with individual efforts.

Selection

Success in transitioning technologies from a lab to the field or an acquisition program hinges on a transition program's ability to choose the most promising technology projects. This includes technologies that can substantially enhance an existing or new system either through better performance or cost savings and those with technologies at a fairly mature stage, in other words, suitable for final stages of testing and evaluation. A program can only do this, however, if it is able to clearly communicate its purpose and reach the right audience to submit proposals in the first place. It is also essential that a program have a systematic process for determining the relative technical maturity of the project as well as for evaluating other aspects of the project, such as its potential to benefit specific acquisition programs. Involving individuals in the selection process from various functions within an organization—e.g., technical, business, and acquisition—further helps to assure that the right projects are being chosen and that they will have interested customers. An analytical tool that can be particularly useful in selecting projects is a technology readiness level (TRL) assessment, which assesses the maturity level of a technology ranging from paper studies (level 1), to prototypes that can be tested in a realistic environment (level 7), to an actual system that has proven itself in mission operations (level 9). Our prior work has

found TRLs to be a valuable decision-making tool because it can presage the likely consequences of incorporating a technology at a given level of maturity into a product development.

As further detailed in table 5, the DACP program has a fairly robust selection process. The program relies on internet-based tools to communicate its goals and announce its selection process and ensure a broad audience is targeted. As a result, it receives a wide array of proposals from which the program office assesses their potential for generating improvements to existing programs as well as actual interest from the acquisition community. The DACP also solicits technical experts from inside and outside DOD to assess potential benefits and risks. Once the number of projects is whittled down, the program takes extra steps to secure commitments from acquisition program managers as well as program executive officers. The program's popularity, however, has had some drawbacks. For example, the sheer number of proposals have tended to overwhelm DACP staff and slowed down the selection process, particularly in the first year. In addition, while technology benefits and risks are assessed in making selection decisions, DACP does not formally confirm the technology readiness levels being reported. The TTI program also has a fairly rigorous selection process, with specific criteria for selection, including technology readiness, and a team of representatives of higher-level DOD S&T officials in charge of disseminating information about the program in their organization, assessing their organization's proposals based on TTI criteria as well as other criteria they developed, and ranking their top proposals. The program, which is focused on reaching DOD's S&T community rather than outside industry, had been communicating in a relatively informal manner and it was unclear during our review the extent to which the TTI was reaching its intended audience. The program, however, has been taking steps to strengthen its ability to reach out to the S&T community. In addition, TTI does not confirm TRLs. At the time of our review, the Quick Reaction Program selection process was much less structured and disciplined than DACP and TTI. This was by design, because the program wants to select projects quickly and get them out to the field where they can be of use in military operations in Iraq, Afghanistan, and elsewhere. However, the program experienced problems related to selection and as a result—for example, significant gaps in knowledge about technology readiness led to the cancellation of one project. To program officials, the risk associated with less formal selection is worth the benefit of being able to move rapidly evolving technologies into an environment where they can begin to immediately enhance military operations and potentially save lives. Nevertheless, the program is now taking steps to strengthen selection processes.

Table 5: Details of Selection Process

	DACP	TTI	Quick Reaction Fund
How program is communicated	Each year, the program office issues an electronic broad agency announcement to communicate program goals and funding availability to both internal and external technology developers. Program officials are satisfied that this approach has helped them reach their target audience as evidenced by the large number of proposals received overall and also by the number received by small and non-traditional businesses. For example, almost 400 proposals were received during the first and second solicitation periods combined. Of those, about 52 percent were submitted by small and non-traditional businesses.	TTI established a working group comprised of senior-level S&T representatives from each of the military services to help disseminate information about program goals and funding availability to their respective organizations. It is unclear whether the TTI is reaching its intended audience. At the time of our review, six project managers we met with stated they found out about the TTI by happenstance and not through any formal mechanism. Furthermore, even though they are now aware of the program, many of these project managers still have not seen the program formally advertised throughout their respective organizations. The program office has been working to improve its ability to reach its target audience and assure that it is considering the best projects for funding by including presentations about the program at S&T forums and seminars and developing a program brochure.	Communication was informal. Each military service and selected defense agency was asked to submit its top 10 proposals. A new website was recently developed to automatically distribute the proposal data call and collect proposals.

	DACP	TTI	Quick Reaction Fund
How projects are evaluated and selected	DACP's selection process is modeled after DOD's FCT program, which already has a well-defined selection process. The process begins with program officials performing an initial review of all proposals to filter out the ones that are not relevant or feasible. Next, proposals are reviewed by a panel of technical experts. If the acquisition program office and prime contractor are interested in the proposed technology, the acquisition program office must develop a final, more in-depth proposal for the program office to consider for funding. Overall, projects are assessed against 24 criteria, including acquisition funding commitment, technology readiness, and whether the project addresses a valid requirement, which are identified in the broad area announcement used to solicit proposals. However, the program office has had some problems processing the large volume of proposals received with a small staff of about 3.5 full-time equivalent positions. Currently, it takes about 9 months for a project to be selected for funding. According to the program manager, the expert technical review is the most time-consuming part of the process. To date, the DACP has had to solicit the services of over 1,000 experts from within the Department, private industry, and academia nationwide to review proposals. Program officials are now considering identifying thrust areas for prioritizing proposals as a way to reduce cycle time. This was permitted by the legislation that set up DACP.	TTI proposals are judged against a set of eight criteria, including time needed to transition, technology readiness, whether the project satisfies a critical requirement, and willingness on the part of an acquisition program to share costs of transition. Working group members play a key role in the selection process by reviewing proposals from their organization and ranking their top proposals for program office consideration. Program officials believe this approach expedites the selection process because it reduces the number of proposals the program office needs to review and also gives the officials an idea of which proposals are the most important to the service or agency.	Selection was not based on well defined criteria at the time of our review. Instead, 2-page proposals were evaluated by the office running the Quick Reaction Fund with an eye toward whether they could bring immediate benefits to ongoing military operations. It usually takes 30 to 45 days between the time the solicitation is issued to the time projects are selected for funding.

	DACP	TTI	Quick Reaction Fund
How TRLs are used	DACP guidance specifically states that technology must have been demonstrated using a representative model or prototype system in a relevant environment, the equivalent of a technology readiness level 6 on a scale of 1-9, to be considered for funding. Technology readiness is also considered by technical experts reviewing proposals. However, DACP does not have a formal mechanism in place to ensure that the technology readiness levels have actually been achieved.	One of the four criteria program officials consider during the selection process is whether the proposed new technology is mature. However, TTI does not have a formal mechanism to confirm technology readiness levels identified in the proposals.	Program officials have limited information about maturity levels. Proposals are required to disclose technical risks to assist in this evaluation, but do not identify specific technology readiness levels. We identified one project where the Quick Reaction Fund invested $1.5 million but later needed to stop the project because technology was not as mature as the project manager originally thought. According to the program manager, TRL maturity will be included as an evaluation factor in the fiscal year 2006 assessment process.

Source: GAO analysis.

Management and Oversight

Selecting promising projects for funding is not enough to ensure successful transition. Program managers must also actively oversee implementation to make sure that project goals are being met and the program is working as intended and to identify potential barriers to transition. They must also sustain commitment from acquirers. Moreover, the transition program as a whole must have good visibility over progress and be positioned to shift attention and resources to problems as they arise.

A tool that has proven particularly useful for other established DOD technology transition programs is designating individuals, preferably with experience in acquisitions or operations and/or the S&T world, as "deal brokers" or agents to facilitate communication between the lab and the acquisition program and to resolve problems as they arise. DARPA employs such individuals, for example, as well as some Navy-specific transition programs. Both have found that these agents have been integral to transition success. Another tool that is useful for sustaining commitment from the acquirers is a formal agreement. Our previous work found that best practice companies develop agreements with cost and schedule targets to achieve and sustain buy-in and that the agreements are modified as a project progresses to reflect more specific terms for accepting or rejecting a technology. DARPA develops similar agreements that describe how projects will be executed and funded as well as how projects will be terminated if the need arises. The agreements are signed

by high-level officials, including the director of DARPA and senior-level representatives of the organizations DARPA is working with. The ACTD program develops "implementation directives" that clarify roles and responsibilities of parties executing an ACTD, time frames, funding, and the operational parameters by which military effectiveness is to be evaluated. The agreements are also signed by high-level officials.

DACP has fairly robust management and oversight mechanisms. Status is monitored via formal quarterly reporting as well as interim meetings which, at a minimum, involve the customer, the developer, and the DACP project manager. The meetings provide an opportunity to ensure the acquisition program is still committed to the project and to resolve problems. Though formal memoranda of agreements are not usually employed, the program establishes test and evaluation plans that detail pass/fail criteria so that funding does not continue on projects that experience insurmountable problems. TTI also employs periodic status reports and meetings; however, communication has not been as open. In two cases, projects ran into significant problems, such as loss of acquisition program office support in one case and logistics issues that had not been addressed to transition a technology smoothly in the other, which had not come to the attention of the TTI program office. As a result, the TTI office thought the projects had transitioned when in actuality, significant problems still needed to be addressed. Per legislation, TTI had also established a formal council comprised of high-level DOD officials to help oversee the program; however, the Council has only met once in 2 years, while the act requires that it meet at least semiannually. In addition, there is some confusion among Council members and others we spoke with as to what the purpose of the Council should be—that is, focused on TTI only or broader transition issues. Congressional officials expressed that they intended for the Council to focus on broader transition issues and how best to solve them. Although the Quick Reaction Fund does not require status reports to assess progress, project managers are required to submit after-action reports. However, these were not regularly reviewed by the office. We identified several problems that arose during transition that were not known to the Quick Reaction Fund program manager. The program manager is currently taking steps to improve the management and oversight of projects. For example, a website has been developed to help monitor and execute the program. Among other things, the website will allow for the automatic collection of monthly status reports.

Table 6: Details on Management and Oversight

	DACP	TTI	Quick Reaction Fund
How commitment is secured	DACP employs a formal commitment process that includes pass/fail criteria that will either sustain commitment or result in the cancellation of a project based upon testing outcomes. DACP guidance includes practices that help the project manager achieve and maintain buy-in until a technology has been successfully transitioned. As part of the selection criteria, both the acquisition program office and prime contractor must agree to accept a technology if it is successfully demonstrated. For example, one of the projects we reviewed established pass/fail criteria for a new technology to repair titanium alloy cracks on the aft section of the B-2 aircraft. Further, selected projects are expected to use integrated product teams (which include at least the vendor, developer, and DACP manager) to exchange information and deal with potential problems very quickly.	TTI employs a formal commitment process; it has not used formal agreements. Initially, all projects must show the acquirer has included funding for the technology in a future budget if the project is to be considered for funding. For the most part, once this happens, there is no requirement for additional interaction through methods like formal agreements. We identified one project that was not able to sustain support from the acquisition program—the IROS3 Spartan project, which is intended to enhance the Navy's shipboard protection. TTI officials believed it had transitioned to an acquisition program, when, in fact, the customer had dropped its support. According to the project manager, the Naval Surface Warfare Center at Crane was supposed to develop the first block of software for the project and a contractor would be selected to develop later blocks. However, after successful field-testing, the acquisition program office decided that it would be less risky to select a contractor to develop all three software blocks than to hand off the government-developed software to the contractor to maintain and upgrade.	No formal commitment process used because the program goal is to demonstrate the military utility of emerging new technologies through field testing, and not necessarily to transition those technologies at this time.

	DACP	TTI	Quick Reaction Fund
How status is tracked	Project managers are required to submit quarterly progress reports and final reports once a project has been completed. In addition to these reports, periodic meetings are held with various participants to assess progress. Reports contain data on project accomplishments, planned actions for the next quarter, issues that need to be addressed, the transition strategy, and the current funding plan. All quarterly reports are submitted and maintained on an electronic system that can be accessed by program officials and the project manager.	Periodic status reports are required and interim progress meetings are held, though not with the same range of representation as DACP. We identified one project—the Terminal Attack Communications Earplug System—where problems had arisen during transition that had not come to the attention of TTI officials. Specifically, problems related to how the earplug's use could be actualized (for example, training technicians to pour the new, custom ear molds and what organization would pay for the training) had not been brought to the attention of the TTI office. In fact, the office had thought the transition had gone smoothly.	After-action reports are required, though not always reviewed for purposes of tracking progress. At the time of our review, the Quick Reaction Fund manager had problems addressing concerns identified in status reports and obtaining reports from some project managers. For example, the program manager was unaware that one project, thought to have been successfully field tested, actually ran out of funding prior to field testing. Although the project manager reported that the project had not been completed because it ran out of funding, the Quick Reaction Fund manager did not have enough time to thoroughly review the report. The program manager expects the newly established web-based system to improve his ability to track project progress.
Use of deal brokers	No formal use of "deal brokers", though involvement of vendors, developers, and customers in status discussions have helped to identify and resolve transition problems.	No formal use of "deal brokers."	No formal use of "deal brokers."

Source: GAO analysis.

Assessment

Though the transition programs we reviewed are relatively small in scale compared to other transition programs in DOD, the government's investment is still considerable and it will continue to grow if DOD's funding plans for the programs are approved. As a result, it is important that these programs demonstrate that they are generating a worthwhile return on investment—whether through cost savings to acquisition programs, reduced times for completing testing and evaluation and integrating technologies into programs, and/or enhanced performance or new capabilities. Developing such information can enable transition

program managers to identify what is or is not working well within a program; how well the program is measuring up to its goals, as well as to make trade-off decisions between individual projects. On a broader level, it can enable senior managers and oversight officials to compare and contrast the performance of transition programs across DOD.

Finding the right measures to use for this purpose is challenging, however, given the wide range of projects being pursued, the different environments to which they are being applied, and difficulties associated with measuring certain aspects of return on investment. For example, measuring long-term cost savings could be problematical because some projects could have impacts on platforms and systems that were not part of the immediate transition effort. As a result, the best place to start may be with high-level or broad metrics or narratives that focus on the spectrum of benefits and cost savings being achieved through the program, complemented by more specific quantifiable metrics that do not require enormous efforts to develop and support, such as time saved in transition or short-term cost savings. At this time, however, the transition programs have limited measures to gauge individual project success and program impact or return on investment in the long term. At best, they are collecting after action reports that describe the results of transition projects, and occasionally identify some cost savings, but not in a consistent manner. In addition, there are inconsistencies in how the reports are being prepared, reviewed, and used. The Quick Reaction Fund program manager, in fact, had trouble just getting projects to submit after action reports.

Officials from all three transition programs we reviewed as well as higher level officials agreed that they should be doing more to capture information regarding return on investments for the programs. They also agreed that there may already be readily available starting points within DOD. For example, the Foreign Comparative Testing Program has established metrics to measure the health, success, and cost-effectiveness of the program and has developed a database to facilitate return on investment analyses. The program also captures general performance enhancements in written narratives. The program has refined and improved its metrics over time and used them to develop annual reports. The specific metrics established by the FCT program may not be readily transferable to DACP, TTI, or the Quick Reaction Fund because the nature of FCT projects is quite different—technologies themselves are more mature and costs savings are achieved by virtue of the fact that DOD is essentially avoiding the cost of developing the technologies rather than applying the technologies to improve larger development efforts. However, the process by which the program came to identify useful

metrics as well as the automated tools it uses could be valuable to the other transition programs. In addition, DOD has asked the Naval Post Graduate School to study metrics that would be useful for assessing the ACTD program. The results of this study may also serve as a starting point for the transition programs in developing their own ways to assess return on investment.

Conclusions

The ability to spur and leverage technological advances is vital to sustaining DOD's ability to maintain its superiority over others and to improve and even transform how military operations are conducted. The three new transition programs are all appropriately targeted on what has been a critical problem in this regard—quickly moving promising technologies from the laboratory and commercial environment into actual use. Moreover, by tailoring processes and criteria to focus on different objectives, whether that may be saving time or money or broadening the industrial base, DOD has had an opportunity to experiment with a variety of management approaches and criteria that can be used to help solve transition problems affecting the approximately $69 billion spent annually on advanced stages of technology development. Already, it is evident that an element missing from all three programs is good performance measurement. Without having this capability, DOD will not be able to effectively assess which approaches are working best and whether the programs individually or as a whole are truly worthwhile. In addition, it is evident that having well-established tools for selecting and managing projects as well as communicating with technology developers and acquisitions helps programs to reduce risk and achieve success, and that there are opportunities for all three programs for strengthening their capabilities in this regard. In light of its plans to increase funding for the three programs, DOD should consider actions to strengthen selection and management capabilities, while taking into account resources needed for implementing them as well as their impact on the ability of the programs to maintain flexibility.

Recommendations for Executive Action

We recommend that the Secretary of Defense take the following five actions:

To optimize DOD's growing investment in the Technology Transition Initiative, the Defense Acquisition Challenge Program, and the Quick Reaction Fund, we recommend that the Secretary of Defense direct the Under Secretary of Defense (Acquisition, Technology, and Logistics) to develop data and measures that can be used to support assessments of the

performance of the three transition programs as well as broader assessments of the return on investment that would track the long-term impact of the programs. DOD could use measures already developed by other transition programs, such as FCT, as a starting point as well as the results of its study on performance measurement being conducted by the Naval Post Graduate School. To complement this effort, we recommend that DOD develop formal feedback mechanisms, consisting of interim and after action reporting, as well as project reviews if major deviations occur in a project. Deviations include, but are not limited to, changes in the technology developer, acquirer, or user, or an inability for the technology developer to meet cost, schedule, or performance parameters at key points in time.

We also recommend that the Secretary of Defense direct the Under Secretary of Defense (Acquisition, Technology, and Logistics) to implement the following, as appropriate, for each of the transition programs: (1) formal agreements to solidify up-front technology development agreements related to cost, schedule, and performance parameters that must be met at key points in time and (2) confirmation of technology readiness levels as part of the proposal acceptance process.

In addition, we recommend that DOD identify and implement mechanisms to ensure that transition program managers, developers, and acquirers are able to better communicate to collectively identify and resolve problems that could hinder technology transition. There may be opportunities to strengthen communication by improving the structure and content of interim progress meetings and possibly even designating individuals to act as deal brokers.

Lastly, as DOD considers solutions to broader technology transition problems, we recommend that Secretary of Defense direct the Under Secretary of Defense (Acquisition, Technology, and Logistics) to assess how the Technology Transition Council can be better used.

Agency Comments and Our Evaluation

DOD provided us with written comments on a draft of this report. DOD partially concurred with four of the five recommendations and concurred with one recommendation. The reason DOD only partially concurred with four of the recommendations is because it does not believe the Quick Reaction Fund fits the definition of a transition program. However, we continue to believe it is important for DOD to institute better management controls and have better visibility of the Quick Reaction Fund as it

increases its investment in this program over the next several years. DOD comments appear in appendix I.

DOD partially concurred with our recommendation that the programs develop data and measures that can be used to support assessments of the performance of the three transition programs as well as broader assessments of return on investment that would track the long term impact of the programs. DOD agreed that performance measures for the DACP and TTI programs could be improved but does not believe that measuring the impact of the Quick Reaction Fund is necessary because it does not technically fit the definition of a transition program. We disagree. DOD should track the progress of its various programs to determine if the programs are worthwhile and should be continued, if the program should receive additional funding, or if changes should be made in the selection or implementation process that could result in better outcomes. Further, failure to track even the most basic information, such as the number of projects completed, could result in a lack of ability to manage the program properly and poor stewardship of taxpayer money.

DOD partially concurred with our recommendation that the three programs develop formal feedback mechanisms consisting of interim and after action reporting, as well as project reviews if major deviations occur in a project. DOD agrees that the TTI and DACP can be improved and has recently taken steps in this regard. However, DOD believes that due to the limited scope and duration of Quick Reaction Fund projects, formal feedback mechanisms may not be necessary for this program. We believe that regular feedback on the progress of each program is important to help program managers mitigate risk. As stated in the report, the Quick Reaction Fund program manager was unaware that one project ran out of funding prior to field testing the technology. Had the program manager been aware of the problem, money that had not yet been allocated could have been used to finish the project. In addition, based upon our discussions with the current program manager, DOD is planning to require monthly status reports for funded projects.

DOD partially concurred with our recommendation that the programs implement, as appropriate: (1) formal agreements to solidify up-front technology development agreements related to cost, schedule, and performance parameters that must be met at key points in time and (2) confirmation of technology readiness levels as part of the proposal acceptance process. DOD indicated that it recently implemented Technology Transition Agreements for the TTI, and the DACP program also uses formal agreements. However, DOD does not believe formal

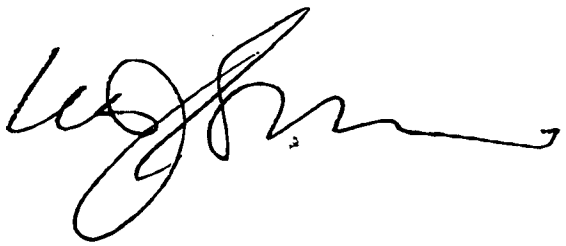
agreements are necessary for the Quick Reaction Fund because it is not intended to be a transition program. Also, it does not believe TRLs should be a factor in the proposal acceptance process. As stated in the report, we agree that formal agreements may not be appropriate for Quick Reaction Fund projects. However, TRLs should be considered during the selection process. Since the goal of this particular program is to prototype a new technology in 12 months or less, it is important that DOD has some assurance that the technology is ready to be field tested. As discussed in the report, the Quick Reaction Fund had to cancel one project, after $1.5 million had already been spent, because it had only achieved a TRL 3. Had the selecting official known the TRLs of each proposed project during the selection phase, he may have decided to fund another, more mature project instead.

DOD also partially concurred with our recommendation that the programs identify and implement mechanisms to ensure that transition program managers, developers, and acquirers better communicate and collectively identify and resolve problems that could hinder technology transition. DOD established a Transition Overarching Integrated Product Team earlier this year to provide the necessary oversight structure to address this issue, but does not believe this recommendation applies to the Quick Reaction Fund program. We believe that if DOD receives monthly status reports on the Quick Reaction Fund, as planned by the program manager, it should be in a good position to identify and resolve problems that could hinder the testing of new technology prototypes.

DOD concurred with our recommendation that the Under Secretary of Defense (Acquisition, Technology and Logistics) assess how the Technology Transition Council can be better used as DOD considers solutions to broader technology transition problems. Although DOD did not indicate how it plans to do this, the Deputy Under Secretary of Defense (Advanced Systems and Concepts) has a goal that the Council not limit itself to just the TTI program, but look at broader technology transition issues across DOD.

We are sending copies of this report to the Secretary of Defense, the Director of the Office of Management and Budget, and interested congressional committees. We will also make copies available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff have any questions concerning this report, please contact me at (937) 258-7915. Key contributors to this report were Cristina Chaplain, Cheryl Andrew, Art Cobb, Gary Middleton, and Sean D. Merrill.



Michael J. Sullivan
Director
Acquisition and Sourcing Management

Appendix I: Comments from the Department of Defense

DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
3030 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3030

Mr. Michael Sullivan
Director, Acquisition and Sourcing Management
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

MAY 2 3 2005

Dear Mr. Sullivan:

This is the Department of Defense (DoD) response to the General Accountability Office (GAO) draft report, 'DEFENSE TECHNOLOGY DEVELOPMENT: Management Process Can Be Strengthened for New Technology Transition Programs', dated May 9, 2005, as revised (GAO Code 120408/GAO-05-480).

We believe a definition for "transition" should be part of this report. From the Department's perspective in the context of this GAO report, "transition" occurrs when a project/program moves from using only R&D funding to using procurement and/or sustainment funding to provide the required/desired capability.

While we generally concur with the report's recommendations, we believe the Quick Reaction Fund (QRF) exists to quickly test, accelerate and/or field an emerging and/or immediate capability that may not require further procurement or sustainment. Thus, QRF should not be viewed as a "transition program". Comments are provided at the Enclosure.

The staff has worked closely with the GAO team and appreciates their inputs to help us strengthen our technology transition programs. Thank you for the opportunity to comment on the subject draft report.

Sincerely,

Ronald M. Sega

Enclosure:
As stated

GAO DRAFT REPORT - DATED MAY 9, 2005
GAO CODE 120408/GAO-05-480

"DEFENSE TECHNOLOGY DEVELOPMENT: MANAGEMENT PROCESS CAN BE STRENGTHENED FOR NEW TECHNOLOGY TRANSITION PROGRAMS"

DEPARTMENT OF DEFENSE COMMENTS TO THE RECOMMENDATIONS

NOTE: The Quick Reaction Fund (QRF) exists to quickly test, accelerate and/or field an emerging and/or immediate capability that may not require further procurement or sustainment. Thus, QRF should not be viewed as a "transition program".

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Under Secretary of Defense (Acquisition, Technology and Logistics) to develop data and measures that can be used to support assessments of the performance of the three transition programs as well as broader assessments of return on investment that would track the long term impact of the programs. (p. 24/GAO Draft Report)

DOD RESPONSE: Partially Concur.
Two of the programs under review (Defense Acquisition Challenge Program (DACP) and Technology Transition Initiative (TTI)) currently collect data and have measures that support assessments of their performance; however these can and are being strengthened. The Quick Reaction Fund (QRF) is not a transition program, but rather a program to quickly test, accelerate and/or field an emerging and/or immediate capability that may not require further procurement or sustainment. Removal of references to the QRF as a "transition program" throughout the report would enable the Department to fully concur with the GAO recommendation.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense direct the Under Secretary of Defense (Acquisition, Technology and Logistics) to develop formal feedback mechanisms consisting of interim after action reporting, as well as project reviews if major deviations occur in a project. Deviations include, but are not limited to, changes in the technology developer, acquirer, or user or an inability for the developer to meet cost, schedule, or performance parameters at key points in time. (p. 25/GAO Draft Report)

DOD RESPONSE: Partially Concur.
Formal feedback mechanisms do exist for two of the three programs under review; however their structure and implementation can be improved. The Department established a Transition Overarching Integrated Product Team (OIPT) in February 2005 within USD(AT&L) that is addressing management and oversight of transition projects which will include the Defense Acquisition Challenge Program (DACP) and the Technology Transition Initiative (TTI). To reiterate, the Quick Reaction Fund (QRF) is not a transition program, but rather a program of

limited scope and duration to quickly test, accelerate and/or field an emerging and/or immediate capability which may not lend itself to reporting under formal feedback mechanisms and project reviews.

RECOMMENDATION 3: The GAO recommended that the Secretary of Defense direct the Under Secretary of Defense (Acquisition, Technology and Logistics) to implement the following, as appropriate, for each of the transition programs: (1) formal agreements to solidify up-front technology development agreements related to cost, schedule, and performance parameters that must be met at key points in time and (2) confirmation of technology readiness levels as part of the proposal acceptance process. (p. 25/GAO Draft Report)

DOD RESPONSE: Partially Concur.
With respect to the use of formal agreements to solidify agreements between the S&T and Acquisition communities, TTI recently implemented Technology Transition Agreements and the DACP uses Program Manager Letters of Endorsement. To reiterate, the Quick Reaction Fund (QRF) is not a transition program, but rather a program of limited scope and duration to quickly test, accelerate and/or field an emerging and/or immediate capability which may not lend itself to developing formal agreements related to cost, schedule, and performance, as well as developing technology readiness levels (TRL) as a part of the proposal acceptance process. By the nature of the QRF, TRLs should not be a factor.

RECOMMENDATION 4: The GAO recommended that the Secretary of Defense direct the Under Secretary of Defense (Acquisition, Technology and Logistics) to identify and implement mechanisms to ensure that transition program managers, developers, and acquirers are able to better communicate and to collectively identify and resolve problems that could hinder technology transition. (p. 25/GAO Draft Report)

DOD RESPONSE: Partially Concur.
As described in Table 6 (page 22) of the GAO report, some mechanisms were already in place. With the help of the GAO audit, the Department has identified additional measures to improve communications and resolve problems that could hinder technology transition. Additionally, the Department established a Transition Overarching Integrated Product Team (OIPT) in February 2005 within USD(AT&L) which will provide the necessary oversight structure to address this issue. The Quick Reaction Fund (QRF) is not a transition program, but rather a program to quickly test, accelerate and/or field an emerging and/or immediate capability that may not require further procurement or sustainment.

RECOMMENDATION 5: The GAO recommended that the Secretary of Defense direct the Under Secretary of Defense (Acquisition, Technology and Logistics) to assess how the

Technology Transition Council can be better used as DoD considers solutions to broader technology transition problems. (p. 25/GAO Draft Report)

DOD RESPONSE: Concur.
The TTI program was established by Congress and prescribes a Technology Transition Council for advice and assistance. As discussed with the GAO, it is the DUSD (AS&C) goal that the Council not limit itself to just the TTI program, but looks at broader technology transition issues across the Department.

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