

A. Defense Technology Transfer Management and Oversight

The Defense Department operates a decentralized technology transfer program. The Military Departments are recognized as separate agencies for program implementation. This has made it a challenge to provide management oversight and coordination within the Defense Department as a whole. However, it has provided an opportunity to learn about some of the best practices in the various Components and disseminate these throughout the Department.

We have over 100 Office of Research and Technology Applications (ORTAs) and other technology transfer focal points. Additionally, we have about half that many legal staff throughout DoD supporting the technology transfer functions. We have found that communication is essential in the technology transfer effort. Communication is necessary within and between the Defense Department activities as well as with potential and existing partners in the private sector. The Defense Technology Transfer Working Group (DTTWG) is a key element in communication within the DoD. Other tools we are using are the Federal Laboratory Consortium for Technology Transfer (FLC), DoD Workshops, Defense Technology Transfer Information System (DTTIS), Websites, DoD Collaboratorium, and other meetings and activities.

Defense Technology Transfer Working Group (DTTWG)

The DTTWG was established in 1994 and is composed of representatives from each of the Military Departments and most of the Defense Agencies. This group meets monthly to review technology transfer issues requiring either consistent policy or approach from a joint Department of Defense perspective. Issues for FY 97 review:

- Review of proposed DoD technology transfer policy document
- Establish and support DoD Workshops on technology transfer
- Operational capability within DoD for a Defense Technology Transfer Information System
- Involvement of the Department's Technology Transfer Senior Managers
- Review of proposed legislative changes for transferring technology to the private sector

DoD Technology Transfer Policy

The Secretary of Defense issued a policy memorandum in June 1995 on technology transfer. We have used this policy for over 2 years and found that, in general, provisions are being followed. We also found procedures supporting this policy established within the Military Departments. In FY 1997, we began developing a DoD Directive and Instruction to institutionalize the policy and procedures for technology transfer implementation. This draft Directive is in the staffing process. It is

intended to provide increased emphasis and stress the importance of technology transfer as a key activity within DoD.

One of the key elements of these documents is the requirement for technology transfer business plans from each DoD activity. The intent is not to cause additional burdens, but to focus on what we are doing, how we are doing it, and who is responsible for accomplishment. While the policy documents were in draft format this year, each Military Department provided a business plan for their Department. Next year the requirement will be for each individual activity (laboratory; research, development, and engineering center; etc.) to provide its own plan. Because DoD operates in a decentralized manner, we need to remain focused on our technology transfer mission and what it takes to accomplish it at the local level.

Federal Laboratory Consortium for Technology Transfer

The Military Departments have been participating in the Federal Laboratory Consortium for Technology Transfer (FLC) through financial support and participation in meetings by their technology transfer focal points. The FLC has transitioned from two meetings per year to one. The FY 97 FLC meeting, held in the spring, provided an opportunity for DoD to hold its third joint session bringing the Military Department and Defense Agency representatives together for an information sharing session.

Based on feedback evaluations, these joint sessions have proven beneficial to the Department as a whole. Therefore, we are planning to include joint DoD sessions at future FLC meetings.

In addition to holding DoD sessions during the FLC meetings, DoD representatives serve in both elected and nonelected positions with the FLC. These leadership functions facilitate sharing of information with other federal departments and agencies and contributes to specific DoD technology transfer activities.

DoD Workshops

Separate from the FLC, we held joint DoD workshops in 1997. In the spring, our first workshop, hosted by the Air Force, established a DoD Technology Transfer Integrated Planning Team focusing on how to best accomplish technology transfer within the DoD. Our second workshop was held in November 1997 and, although not in FY 97, it was prior to this report and contributed to the activities we are presently pursuing. The workshops allow sharing of best practices/lessons learned among the DoD technology transfer focal points, provide an opportunity for training, and enhance communication among the ORTAs and focal points.

These workshops were deemed important to improve the DoD technology transfer program, therefore, we plan to hold annual workshops in the fall of the year. The FLC annual meetings will be in the spring. This will allow DoD technology

transfer focal points to meet in both the spring and fall to discuss best practices, policy implementation, and lessons learned.

DoD Collaboratorium

During the spring DoD TTIPT workshop, internal communication/coordination was discussed. There are many times when a new idea would prove useful to the Department as a whole or when someone has worked through an issue that could benefit others. Rather than wait for the next workshop, FLC meeting, or just passing the information to one person via telephone or e-mail, it was decided to set up an internet site available for internal DoD discussions.

The Air Force took the lead and established a DoD Collaboratorium. This collaboratorium is an informal meeting place where ideas and comments can be shared. Each participant can read what others have to say and can reply. One of the positive features of using a collaboratorium is that people can use it at convenient times so elaborate schedules don't have to be set up to participate in discussions.

Websites

The importance of making information available within the Department as well as to external activities has been recognized through establishment of a websites. Through these linked websites, one can find the latest DoD policy documents on technology transfer; a listing of Office of Research and Technology Applications (ORTAs) focal points with addresses and telephone numbers; information on Independent Research and Development, Small Business Innovation Research, Manufacturing Technology; and legislation guiding DoD's technology transfer program.

<u>Activity</u>	<u>Website</u>
Office of the Secretary of Defense	http://www.dtic.mil/techtransit
Army	http://w3.arl.mil/tto/ArmyDTT/adthtp.html
Navy	http://www.onr.navy.mil/sci_tech/industrial/tt.htm
Air Force	http://tto.wpafb.af.mil/TTO/techtran/index.htm
BMDO	http://www.acq.osd.mil/bmdo/bmdolink/html/transfer.html

Defense Technology Transfer Information System (DTTIS)

DTTIS became available for internal DoD use in July 1997. It contains data on technology transfer mechanisms, points of contact within the DoD and at the private

sector partner, goals, objectives, and the status of the activity. Queries to the system can be made on both demographic as well as subject areas.

The DTTIS is used to respond to requests for technology transfer data from the Office of Management and Budget as well as other inquiries for information. Appendix B is a report showing DoD laboratories and centers and the number of reported active technology transfer mechanisms in place during FY 95 - FY 97. There is a significant increase in the number of reported active technology transfer mechanisms since this Report was forwarded in FY 97. This is due to several reasons: 1) our technology transfer activities are increasing, 2) more DoD activities are submitting information to DTTIS, and 3) we have automated the system for collecting this information. Some of these reporting laboratories/centers will change over the years as reorganizations and functional realignments take place. For example, the Naval Undersea Warfare Center in New London, Connecticut, was closed October 1, 1997. We have identified active technology transfer mechanisms there; however, no activities will be reported for FY 98.

Department Technology Transfer Senior Managers

In April 1997, a meeting, chaired by Dr. Lance Davis, was held with the Technology Transfer Senior Managers from the Military Departments and Defense Agencies. These senior managers are from the Senior Executive Service and manage the technology transfer program within their respective Military Department/Defense Agency. The purpose of the meeting was to review and approve the DTTIS changes and consult on how technology transfer could be better implemented throughout the Department. The Senior Managers discussed specific applications and processes and gave support for a DoD Directive on the Technology Transfer Program.

Highlights

The decentralized approach to managing the technology transfer program in DoD enables each activity to accomplish what best meets their mission requirements. Some highlights of these activities which also benefit the commercial sector, broken out by Military Department, are:

Army

Testing Capability at the Medical Research Institute of Chemical Defense (MRICD): CRADAs for Material Transfer, a shortened version of a full research effort, are used at MRICD. Through them, a company can provide the Institute with a sample of their experimental or off-the-shelf compound that may be of interest to MRICD research and receive a testing report that would be costly if obtained through a private source. The test results may provide the company with valuable information that could be used to market their product. This is especially appealing to small businesses that cannot afford expensive laboratory resources.

Standardization of helicopter maintenance practices at Aviation Applied Technology Directorate (AATD): The Infrastructure Definition for Digitally Enhanced Aviation Logistics (IDDEAL) program is a cooperative agreement between AATD and the Rotorcraft Industry Technology Association, Inc. (RITA), a nonprofit corporate entity made up of the 4 major US helicopter manufacturers: Bell, Boeing, and Sikorsky. With this teaming arrangement, IDDEAL hopes to facilitate the standardization of helicopter maintenance practices within the US military and domestic commercial fleets.

Business incubator at Armament Research, Development & Engineering Center: The Picatinny Innovation Center (incubator) is designed to help start-up companies create employment opportunities and act as a technology transfer mechanism to share ARDEC resources with the private sector.

Navy

Since 1980, the Navy has been among the top Federal Agencies reporting patents. Since 1990, the Navy has led the Federal Agencies in patents received. In 1995, the Navy received 330 patents. In 1997, there were 556 inventions by Navy inventors (including joint Navy employee-contractor/grantee/CRADA collaborator employee) and 431 patent applications.

Entrepreneurial Technology Apprenticeship Program (ETAP): In FY 97, 5 students from Historically Black Colleges or Universities/Minority Institutions were placed in Navy laboratories for nine months. These students are learning practical skills about technology management and contributing their knowledge and skills to the success of the offices to which they are assigned.

1-800-NAVYTEC: The Navy maintains this 1-800 line at the National Technology Transfer Center to attempt matching of technology needs of civilian firms with the technologies and technological expertise of the Navy laboratories.

Seven Navy activities completed their first-ever CRADA in FY 97:

- Navy Clothing and Textile Research Facility
- United States Marine Corps
- United States Atlantic Command, Joint Training, Analysis & Simulation Center
- Navy Experimental Diving Unit
- Navy Disease Vector Ecology and Control Center
- Naval Surface Warfare Center, Port Hueneme Division
- Naval Medical Center San Diego

Air Force

Use of Air Force Institute of Technology (AFIT) Master's Degree Students: The Air Force Technology Transfer Office (TTO) sponsored two AFIT student master degree theses in the area of transfer process management. Through this project, Master Degree Students become aware of the technology transfer function and know their

theses will be used rather than put on a shelf and the TTO obtains valuable analysis on technology transfer processes and procedures at minimal cost.

1-800-203-6451: Tech Connect is a gateway to provide information on a particular technology, search for technologies, and accelerate the transition of technologies. It receives telephone and e-mail inquiries from potential outside partners and searches for technical experts in the laboratories and centers who can best answer the customer's technical questions.

DoD Technology Transfer Integrated Planning Team (DoD TTIPT): The Air Force has been holding Air Force TTIPT meetings semiannual for several years. In early FY 97, they proposed a DoD TTIPT workshop which they hosted and managed in May 1997. This first-ever DoD TTIPT workshop accomplished several things: gathered together most of the people in DoD involved with technology transfer functions, shared best practices, discussed legislative impacts to the program and how they are implemented within the separate Departments, and identified the need for continued communication.

Success Stories

DoD and the private sector have experienced numerous successes in working together through partnership agreements, CRADAs, and other technology transfer mechanisms. Two specific examples of successes are:

1. CELLMAX Artificial Capillary System: Grow your own bone marrow or other blood cells for compatible, non-rejection therapy. The objective was to combine Cellco's devices and patents for blood treatment with the Navy Medical Research Institute's (NMRI) patented methods for blood cell therapy, thus producing more healthy cells for therapy. Blood cells are removed from the patient's system, passed into Cellco's Artificial Capillary System, enriched with media and growth factors using NMRI's stem cell culture methods and restored to the patient with many times the number of (now healthy) cells. The commercial payoff is efficient, inexpensive, healthy cell production to treat disease or trauma where blood is deficient or damaged in critical cell components or in bone marrow injury.

2. An Air Force technology used to locate tanks on the ground has been used to refine a computer assisted minimally invasive surgery (CAMIS) system capable of improving treatment of brain, prostate, and breast cancer. Use of this technology to treat brain cancer will reduce post-operative complications, shorten hospital stays and lower surgical cost by at least 30 percent. The CAMIS system uses an electronic wand that senses internal anatomical information that is forwarded to a computer where image data are converted to a 3-dimensional representation for the surgeon. The accuracy and speed of locating tumors has been improved by the addition of an optical digitizer used by the Air Force to develop geometric models for radar target recognition. This new digitizer, along with software modifications, enables real-time 3-D screen updates before an incision is made.