

APPENDIX D

Highlights of the DoD Technology Transfer Program in FY 2001

Appendix D: Highlights of the DoD Technology Transfer Program in FY 2001

These highlights are offered to give a perspective on the variety of activities, technologies, and capabilities that are part of the DoD Technology Transfer Program. The key highlight of the year is at the end of this appendix.

Army

- **Benet Laboratories** at Watervliet Arsenal is part of the Army's Tank and Armaments Command's Armament Research and Development Center. It has unique expertise in large bore cannon design and development. Seven employees at Benet have been recognized with R&D achievement awards. Benet made advancements in development of a new structural coating with Defense and nondefense applications, with 8 new invention disclosures in process. Additionally, Benet has entered into an educational partnership agreement with Hudson Valley Community College.
- **Space and Missile Defense Command** provides space and missile defense capabilities for the warfighter and the Nation. It has multiple site locations and expertise. An effort has been made to more closely link technology transfer efforts with systems engineering functions and to continue outreach to support State RDT&E efforts via participation on review boards, support local endeavors such as a business incubator, and create alliances with NASA.
- **Communications and Electronics Command's (CECOM) Research, Development and Engineering Center** identifies, develops, evaluates, and tailors emerging information technologies, facilitates the transition of selected technologies into operational systems, and performs and promotes Systems of Systems integration. CECOM seeks to be the universally recognized leader in providing information dominance capabilities to our warfighters. CECOM has focussed on using several existing programs to support the technology transfer effort. These are: the Small Business Innovation Research Program (SBIR) to develop partnerships and bring in new technologies for our systems; Dual Use Science and Technology Program (DUS&T) to develop dual use technologies with industry; Independent Research and Development Program (IR&D) as technology leveraging opportunities; and CRADAs.
- **Aeromedical Research Laboratory's** objectives are to prevent or minimize health hazards in the military operational environment and to sustain aviator performance. This includes acoustics, vision, crew workload, stress and fatigue, repetitive impact, and life support systems. Four of the invention disclosures filed in FY 01 were in the area of speech intelligibility measurement that should have an impact in the area of assistive technologies.
- **Clinical Investigation Regulatory Office** serves as a second level review for all clinical research conducted by the U.S. Army. Due to budgetary constraints, the CRADA process has become the primary method for legally securing funds that are essential to the ability to conduct clinical research within Army Medical Treatment Facilities (MTF). The Commanding General, the Army Surgeon General, and the Assistant Secretary of Defense (Health Affairs) are briefed on

an annual basis on the status of these technology transfer initiatives. FY 01 was a very successful year with 109 new agreements signed, 57 completed, and 181 continuing. These high numbers are directly attributable to streamlined negotiation and legal review procedures as well as an increased Command emphasis on the use of CRADAs to extramurally fund clinical research within Army hospitals.

- ***Soldier & Biological Chemical Command, Natick Soldier Center*** seeks to be the R&D Center of Choice for individual warrior-related technologies and warrior systems and internationally known as a preeminent provider of research, development, engineering, and integration services (food, clothing, airdrop, and shelters for the individual warfighter and organizational units). Mr. Philip Brandler, laboratory director, was named Federal Laboratory Consortium Laboratory Director of the Year in FY 01.
- ***Edgewood Chemical and Biological Center*** experienced a significant leveraging of resources with its 39 new technology transfer agreements, including one with Fibertek, Inc., to pursue dual-use applications for the Short Range Biological Standoff Detection System to include commercial, military, and other Government agencies' use.
- ***Engineer Research and Development Center*** supports civil and environmental engineering missions. Royalties from patent license agreements (PLAs) have been used to support legal costs associated with worldwide patent applications and to support other R&D efforts on technologies with potential commercial applications.

Navy

- ***Naval Space and Warfare System Center (SPAWARSYSCEN)*** is the Navy's RDT&E and fleet support center for command, control and communication systems and ocean surveillance and the integration of those systems which overarch multiplatforms. Its vision is to be the Nation's preeminent provider of integrated C4ISR solutions for warrior information dominance. Emphasis is on transitioning emerging technologies and concepts into the early system design phases, thereby impacting the design of new major platforms and systems. To encourage inventors to commercialize their patents, the Center has recently doubled inventor patent application and issuance awards and doubled the inventor's share of royalties received. The new policy will provide \$500 for each patent application, \$1,000 upon issuance, and 40% of all royalties received from PLAs.
- ***Naval Surface Warfare Center Indian Head Division (IHDIV)*** is involved in energetics R&D, manufacturing technology, engineering, testing, manufacturing, and fleet support. Through a PLA and follow-on CRADA for technical assistance, a commercial product using IHDIV technology for a differential pressure flow sensor should be on the market in the spring 2002.
- ***Navy Clothing and Textile Research Facility (NCTRF)*** works in support of clothing, textiles, and related fields associated with service clothing and environmental protective clothing. In FY 01, the NCTRF allowed industry access

to its unique equipment/capabilities in thermal and flame assessments via Testing Agreements.

- **Naval Undersea Warfare Center Division Newport (NUWC DIVNPT)** provides the technical foundation to help ensure the undersea superiority of the U.S. Navy. NUWC DIVNPT operates a highly efficient patent program believed to be the most productive in U.S. government when using the invention disclosures per scientist/engineer metric. In FY 01, 190 invention disclosures were recorded, 100 patent applications were filed, and 78 patents were issued or allowed.
- **Naval Air Warfare Center Weapons Division (NAWCWD)** mission is to ensure battlespace dominance by performing RDT&E, logistics, and in-service support for guided missiles, free-fall weapons, targets support equipment, crew systems, and electronic warfare systems. Technology Transfer and Strategic Partnerships are primary thrusts in the NAWCWD Strategic Plan.
- **Naval Surface Warfare Center Carderock Division** is the principal Navy resource, national focal point, and international leader in surface and undersea vehicle science, ship systems, and related maritime technology. One technology developed and patented is an improved silicon rubber gasket design. The new gasket has been adopted for use by the entire Navy fleet as well as the U.S. Coast Guard.

Air Force

- The **Air Force Research Laboratory (AFRL)** mission is to lead the discovery, development, and integration of affordable warfighting technologies for our aerospace forces. AFRL customers include the Air Force major commands who operate and maintain the Air Force's weapon systems.
 - The AFRL has established web-based technology transfer training for scientists and engineers as well as established a course, "Management of Technology" at the Air Force Institute of Technology's School of Engineering and Management to provide training on technology development and transfer.
 - **Air Force Air Armament Center (AAC)** is one of four product centers in the Air Force Materiel Command and is the focal point for all Air Force conventional armaments and all air-delivered conventional weapons. The AAC's 46th Test Wing operates a unique asset, the McKinley Climatic Laboratory, capable of testing military hardware as large as a bomber in environments ranging from minus 65 to plus 165 degrees Fahrenheit with 100-mph winds, icing, clouds, rain, and snow.
 - Both the AFRL **Space Vehicle and Directed Energy Directorates** at Kirtland AFB, NM, have focussed efforts on technology transfer for education. In addition to the FLC award identified in Appendix E, the program director received the 2001 State of New Mexico Distinguished Public Service Award on behalf of this program. Over 49,000 students from more than 120 schools in New Mexico have benefitted from the Technology Transfer for Education (TTE) program efforts to date. Currently, the TTE has 77 Educational Partnership Agreements and 18 CRADAs with local school districts.

Defense Agencies

- ***Defense Advanced Research Projects Agency (DARPA)***: DARPA is the central R&D organization for the Department of Defense (DoD). It manages and directs selected basic and applied R&D projects for DoD, and pursues research and technology where risk and payoff are both very high and where success may provide dramatic advances for traditional military roles and missions. DARPA accomplishes this mission through working with DoD and other federal department laboratories, contracting with private industry, and partnership arrangements supporting collaboration for technology development. While it does not own or develop intellectual property itself, the labs, industry, and academia working with DARPA have been able to exploit the DARPA-supported technology advancements for both commercial and military benefit.
- ***Defense Information Systems Agency (DISA)***: DISA is a combat support agency of the Defense Department. It is the central manager of major portions of the Defense Information Infrastructure. DISA is a relatively new agency and is in the early stages of educating its workforce on a technology transfer program. Several companies have contacted DISA concerning partnerships and joint efforts using CRADA authority; however, none have resulted in CRADAs or other partnerships as of the end of FY 2001.
- ***National Imagery and Mapping Agency (NIMA)***: NIMA focuses on imagery, imagery intelligence, and geospatial information. NIMA does not have a traditional R&D laboratory with employees that produce inventions. However, it works with industry partners to develop problem solutions for insertion into commercial off-the-shelf packages and/or current production items. Use of CRADAs enhances this capability.
- ***National Security Agency (NSA)***: NSA is the Nation's cryptologic organization. Its technology areas include computing, communications, networking, microelectronics, biometrics, advanced mathematics, and signals processing. While NSA approached technology transfer cautiously at first, this technology sharing and collaboration have resulted in direct benefits to technology challenges faced by the Agency.

KEY HIGHLIGHT:

Admiral Bowen Award Nomination and a Signed Patent License Agreement:

Carderock Division has also recognized Frank McMullin and Marlin Rowe by nominating their patented new gasket for watertight closures for an Admiral Bowen Award, which is named in honor of Vice Admiral Harold G. Bowen, who was the first CNR. The award honors one patent that is determined to have had a significant impact upon the sailor and the Navy.

For over fifty years, the Navy has relied on a neoprene type gasket material to provide a watertight (WT) and airtight (AT) seal on virtually every manually operated structural door, hatch, and scuttle installed on Navy surface ships. While this gasket was suitable for the intended purpose, its service life was relatively short. The gasket

material lacked resiliency and would quickly develop a permanent set or groove from being compressed against the knife edge sealing surface of the closure frame. The gasket would dry out, harden, and crack with age, making it difficult to compress. Replacement of the gasket material was relatively inexpensive but the labor involved was arduous and time consuming, often requiring two men for approximately 2-4 hours.

Gasket material for use in closures in firezone boundaries is extremely hard and virtually incompressible, with a rough surface texture that quite often does not provide a proper watertight or airtight seal. Replacement of this gasket material is expensive and the labor involved in its replacement is even more difficult and time consuming than the other gasket.

Mr. McMullin has recently developed and patented an improved silicon rubber gasket design that is suitable for use in all Navy standard, manually operated non-ballistic structural closures in watertight, airtight and even firezone applications. The unique feature of this gasket design is its configuration. A radius cutout in the back of the gasket provides added resiliency and allows for quick and easy installation in the "C" shaped gasket channel of the closure. The new gasket has been adopted for use by the entire Navy fleet as well as the U.S. Coast Guard.

Numerous advantages were realized by the use of this new gasket. The most significant advantages are as follows:

1. Labor savings – Installation time is reduced by 90%, thereby reducing maintenance hours spent on gasket replacement.
2. Increased service life – Silicon rubber gasket material remains soft and pliable after many years of use. It is unaffected by extreme temperatures, prolonged exposure to sunlight, and retains its shape after repeated and extended periods of compression.
3. Less component wear – Due to the softness of the gasket, the force required on the operating handle of quick acting doors to dog the closure is reduced by 40%. This results in less friction on the operating mechanism, less wear and tear on the bearings, dogs, and dog wedges and provides smooth and easy operation of the closure. This reduction meets the operating force requirements of ASTM F1166 for the 5th percentile female.
4. Increased ship survivability – The new gasket, through extensive testing by NRL, has far superior fire resistant qualities. Therefore, all closures installed with this gasket, will significantly decrease the spread of fire and smoke.
5. Cost savings – Gasket in firezone boundaries will realize a cost saving of approximately \$18 per linear foot. Cost savings are also realized through

the reduction in installation labor, longer life cycle, and less wear on moving parts.

Implementation of this new gasket is being accomplished on existing ships in the Fleet through attrition and ship alteration. More than 50,000 manually-operated watertight and airtight closures are affected by this gasket. Over 1,000,000 feet of gasket has already been installed throughout the Fleet.

The development of this new gasket was achieved at a minimal cost. Approximately \$8,000 was used by CDNSWC for prototyping and testing while fire testing by NRL added another \$10,000 to the overall cost. This is truly amazing when considering the impact this invention will have on the sailor and the Navy.

A patent license agreement was signed with Pacific Aerodyne.