

D. MANUFACTURING TECHNOLOGY (ManTech) PROGRAM



DoD's Manufacturing Technology (ManTech) Program develops new and improved manufacturing processes to facilitate more affordable production of DoD weapon systems and components. The Program

addresses process technology issues from the systems development phase through transition to production and into sustainment. ManTech investments target defense-essential needs that industry would not otherwise pursue alone in a timely manner. ManTech improvements generally translate into cost avoidance or cycle time reductions. However, investments also focus on developing "new" capabilities that may result in a more expensive component, but will provide dividends in system performance or life cycle cost that far outweigh the initial cost. The Program is structured around two major thrust areas:

- Processing and Fabrication activities develop affordable processes for metals, composites, and electronics by improving factory floor and repair and maintenance facility (depots, logistics centers, and shipyards) processes.
- Advanced Manufacturing Enterprise activities accelerate implementation of world-class industrial practices, advanced design, and information systems that support weapon system development, production and sustainment.
- In addition to the two thrust areas, two special areas are emphasized:
- Energetics/Munitions projects focus on improving processes associated with propellants, explosives, pyrotechnics, reactive chemicals, and conventional munitions.
- Sustainment projects coordinate common DoD opportunities to increase the reliability and reduce the cost of repair processes for aging systems.

In response to the requirements of 10 U.S.C. section 2525(e), the Department issues an annual Five-year Plan for the ManTech Program in March of each fiscal year. The Plan, available on the Internet at <http://mantech.iitri.org/pubs/pubs.html>:

- Describes the ManTech Program's goals, priorities, and investment strategy.
- Presents Military Department and Defense Logistics Agency funding for fiscal year 2000, and planned funding for fiscal years 2001 through 2005.
- Includes a description of all projects completed in the past three years and the status of implementation.
- Assesses the extent of cost sharing with commercial enterprises, Defense program offices, other Federal agencies, institutions of higher learning, and other sources.
- Summarizes program measures of effectiveness and the results of internal and independent reviews.
- Provides examples of success stories and achievements.

Technology Transfer & Dual Use

The ManTech program is driven by defense needs for technologies and systems that provide a superiority edge to the warfighters. In today's environment DoD is involving the commercial industrial base as soon as possible, by either adopting its best practices or transferring results of military processes to the commercial arena. For example:

- The Air Force ManTech program is facilitating the introduction of filmless radiography in support of aircraft nondestructive inspection. Used widely by the medical community, filmless radiography eliminates the cost of film, processing, and labor-intensive archiving by enabling images to be digitally transmitted over local area networks for immediate physician assessment. The effort with Liberty Technologies, Inc. assessed the viability of upgrading an existing commercial filmless radiography system for supporting aircraft structural inspection techniques. The new process detects corrosion, cracks, foreign object damage, moisture entrapment, and produces images ranging from 3x3 inches to 14x17 inches in size.
- The Defense Logistics Agency, the Army's Watervliet Arsenal and Benet Laboratories, and the American Metalcasting Consortium received the Hammer Award in 1999 for reinventing the Army's metalcasting design and acquisition process. The program harnesses best commercial practices, including part design, use of blanket purchase agreements with pre-qualified foundries, and improved communications between suppliers and users. Over \$4 million in annual life cycle cost avoidance is projected as a result of cycle time reductions and reduced parts count generated from redesign of various weapon systems components into casting assemblies, including the M1 tank, 120mm mortar, F-22, lightweight howitzer, and other support equipment.
- Advanced Fiber Placement technology, funded by the Navy ManTech program from the early 1990s, is receiving widespread industrial base application. Sponsored by the Center of Excellence for Composites Manufacturing Technology, this process applies composite material to a tool surface using an application head mounted on a multi-axis numerically controlled machine tool. The application head cuts individual fibers, enabling fabrication of complex shapes. Initial implementation by Boeing was on the F/A-18E/F horizontal stabilator and by Northrop Grumman on the F/A-18E/F engine inlet ducts and fuselage panels. Successful technology transfer has been demonstrated the past several years with transition to the V-22 fuselage skin; F-22 pivot shaft; C-17 landing gear pod fairings; the Composites Armored Vehicle upper hull assembly; T-45 horizontal stabilator; AH-1 helicopter main rotor spars and cuffs; X-33 fuel tanks; and JSF inlet ducts. Commercial spin-offs include the Boeing helicopter 609, Boeing 777, and Raytheon Premeir.

Recent Management Initiatives & Accomplishments

The Science & Technology (S&T) Affordability Task Force continues to establish processes to strengthen the affordability content of the DoD's S&T programs. The objective is to identify mechanisms that focus DoD's technology programs on implementing Integrated Product and Process Development (IPPD), and facilitate use of Integrated Product Teams. In 1999, the Task Force:

- Sponsored a conference attended by 200 S&T managers from DoD and industry to share affordability best practices and lessons learned. The session included a panel session with each of the Service Acquisition Executives.

- Reviewed and evaluated 20 S&T programs for attention to affordability.
- Continued development of training initiatives with each of the Military Services.
- Worked with each Service to sponsor separate workshops focused on improving the process for transitioning the results of 6.3 advanced technology development efforts into acquisition.
- Published a handbook for S&T managers for use during formulation of affordability programs.

The annual Defense Manufacturing Conference continues to be a premier activity for networking and sharing the results of ongoing and completed manufacturing programs across the DoD, industry, and other government agencies. The 1999 conference was held in Miami, FL. Over 800 leaders from government, industry, and academia attended. Keynote speakers included the Honorable Jerry Hultin, Under Secretary of the Navy; Mr. Joseph Eash, Deputy Under Secretary of Defense for Advanced Systems and Concepts; and Mr. John Murphey, President, Bell Helicopter Textron. The conference featured panel sessions providing customer viewpoints from both the weapon systems and logistics community. Exchange of technical information was promoted by use of concurrent briefings spanning over 100 technical projects, and via evening receptions held with over 70 exhibitors from DoD, industry, and academia.

To improve ownership for the ManTech program, the Joint Defense Manufacturing Technology Panel (JDMTP) published an "Overarching Strategy" in December 1999. This brochure is being used to facilitate communication of ManTech's purpose, vision, role of the JDMTP, and success stories to improve program advocacy with the internal and external program customers across the DoD, with Congress, industry, and academia.