

"The U.S. military remains well-positioned to leverage our technological and human capital strengths. The United States will remain a global leader in creative development and use of technology. U.S. innovations in warfighting, which have provided key capability advantages in areas such as undersea warfare, are built on the continued strength of our defense industrial base, a national asset that the Department of Defense is committed to supporting. Advanced technology, in addition to providing new combat capabilities, will continue providing life altering advances for the treatment of Soldiers, Sailors, Airmen, and Marines."

—2014 Quadrennial Defense Review (QDR) Report, Department of Defense, Page xv.



Manufacturing Technology Program

Bringing Innovations to the Warfighter

Tracy Frost ■ Scott Frost



Providing warfighters with cutting-edge capabilities in a timely manner means turning scientific discoveries or inventions into affordable, operational and integral products. The Department of Defense (DoD) Manufacturing Technology (ManTech) program serves as an enabler of technology transition by bringing affordable technologies to acquisition program managers through new manufacturing and production processes and systems.

Defense acquisition programs rely on innovative manufacturing capabilities and an industrial base that can use these capabilities to deliver products that meet the needs of the warfighter. In the 20th century, when the threat was highly predictable and the U.S. defense industrial base was largely self-contained, ManTech helped keep the nation positioned to produce the best military systems in the world. In the 21st century, the DoD faces a range of strategic, conventional and asymmetric challenges while the U.S. technological advantage is under strain and the defense industrial base is increasingly reliant on commercial capabilities. To address these challenges and equip America's warfighters, program managers are tapping a globally networked and diverse industrial base. Compounding this complexity is the increasing imperative to consider affordability in the DoD's science and technology, acquisition and sustainment plans. These are the new demands placed on defense manufacturing, and they are shaping the role of ManTech.

The program looks beyond the normal risk of industry and directs investments at improving the quality, productivity, technology and practices of businesses and workers that provide goods and services to the DoD. ManTech focuses on enabling the affordable and timely development, production and sustainment of defense systems, thereby enhancing our technological edge in a dynamic, diverse and evolving threat environment.

Tracy Frost joined the Department of Defense (DoD) Manufacturing and Industrial Base Policy (MIBP) office in 2015 and currently serves as the director of Manufacturing Technology. She leads the Defense-wide Manufacturing Science and Technology Program investment portfolio, including the DoD Manufacturing Innovation Institutes funded within that portfolio. **Scott Frost** is a principal analyst and program manager at ANSER, a not-for-profit public service corporation. Since 2008, he has been responsible for leading the development of, and updates to, the DoD ManTech Program Strategic Plan on behalf of the Office of the Secretary of Defense (OSD)/MIBP ManTech office and the Joint Defense Manufacturing Technology Panel, and for overseeing ANSER's overall planning, policy and analytical support to the OSD/MIBP ManTech office.

The DoD ManTech Program is administered for the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]) by the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy (MIBP) who exercises Office of the Secretary of Defense (OSD) oversight of the ManTech program. ManTech includes component programs individually executed by OSD and the Army, Navy and Air Force, the Defense Logistics Agency (DLA) and the Missile Defense Agency (MDA). Although all Component ManTech programs work in concert toward common goals, each has important focus areas to meet individual Component mission needs.

integrated approaches to maintaining the full suite of necessary defense manufacturing enterprise capabilities.

The Joint Defense Role

The component ManTech programs collaborate and coordinate their efforts through the Joint Defense Manufacturing Technology Panel (JDMTP). The principals of the JDMTP are senior technology managers representing the Army, Navy, Air Force, DLA, MDA and OSD. The JDMTP categorizes ManTech investment areas by the technology portfolios of subpanels. The current subpanels are Electronics, Metals, Composites and Advanced Manufacturing Enterprise—

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The Army ManTech Program is structured around enabling manufacturing improvements of components and subsystems for ground, soldier/squad, air, lethality and command, control, communications and intelligence systems.

The Navy ManTech Program's critical goal is to reduce the acquisition cost of current and future platforms, resulting in an affordability investment strategy currently focused on five ship platforms and the F-35 and CH-53K aircraft.

The Air Force ManTech Program is the DoD's lead for manufacturing technology in aerospace propulsion, structures and intelligence, surveillance and reconnaissance and is the only Air Force corporate program working strategic issues and opportunities in manufacturing and industrial readiness. Manufacturing technology plays a pervasive role in enabling many Air Force Science and Technology Strategy priorities, chiefly through attaining next-generation agile manufacturing.

The DLA ManTech Program focuses on sustaining the warfighters and improving materiel readiness. Ongoing efforts support improvements in availability of microcircuits, combat rations, clothing and protective equipment, batteries, forgings and castings.

The OSD-managed Defense-wide Manufacturing Science and Technology (DMS&T) Program takes a broad, overarching view toward closing critical gaps in cross-cutting, military manufacturing enabling technologies that will have significantly impact multiple Military Departments or platforms.

In particular, MIBP has the organizational visibility and access to policy and investment levers to enable more coherent and

enabling Component ManTech programs to maximize opportunities for shared investment in initiatives and strategies with joint application and preventing duplication of effort.

The JDMTP is moving forward with joint planning and coordination on major weapon systems, including the F-35. In the case of the F-35 Lightning II, four ManTech projects (two Navy and two Air Force) directly affected F-35 affordability. With a combined investment of \$14.5 million, these initiatives are projected to reduce F-35 program costs by \$1.1 billion over 30 years of production. More importantly, these technology advances can be leveraged by current and future defense programs to reduce costs and bolster U.S. manufacturing capabilities.

Other successful ManTech projects include:

- The Large Affordable Substrates project provides a domestic source of cadmium zinc telluride wafers for military critical infrared focal plane arrays.
- The Chip Scale Atomic Clock program enables affordable, precise timekeeping within C4ISR (command, control, communications, computers, intelligence, surveillance and reconnaissance) systems in GPS-denied environments by reducing unit cost from \$8,700 to \$400, enabling production to increase from 10 per year to 40,000 per year. Potential savings are projected to approach \$300 million.
- The Cold Spray Deposition project creates an automated repair cell, which increases flight readiness rates for Navy and Marine helicopters. Presently, parts are scrapped, increasing sustainment cost and stressing a casting industrial base with long lead times. The savings for the CH-56 Helicopter program alone is projected at \$100 million annually.



- Virginia Class Submarine (VCS) initiative: 31 of the ManTech affordability projects have been implemented or are in process. Realized cost savings per hull of more than \$27.7 million have been recognized by the Virginia Class Submarine Program Office and General Dynamics Electric Boat.

innovation ecosystem composed of a growing network of regionally based but nationally impactful Manufacturing Innovation Institutes across the United States. Each has a technical focus area of high importance to both the federal government and to industry.

The DMS&T Program: Underpinning DoD's Manufacturing Innovation Institutes

In addition to its broad DoD ManTech Program oversight responsibilities on behalf of the USD(AT&L), the OSD ManTech office housed in MIBP also oversees and executes the DMS&T program component of the DoD ManTech Program. The DMS&T program is an important joint enabler that complements each Service's and agency's ManTech program. It focuses on broad, cross-cutting defense manufacturing needs—those that are typically beyond the ability or risk of a single Military Service or agency to address and to stimulate the early development of manufacturing processes and enterprise business practices concurrent with S&T development to achieve the largest cost-effective impact.

It was out of the DMS&T program that the seeds were planted for the DoD to embrace industry and academia in broader public-private collaboration to enhance national manufacturing capabilities, including those with likely defense applications. In 2012, the DoD was asked to be one of the leads in an effort to create a National Network for Manufacturing Innovation program. This program seeks to create a robust national

ManTech's Legacy

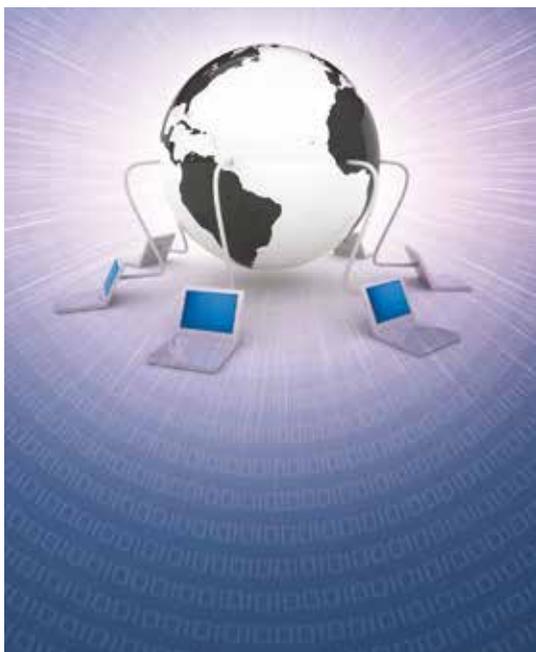
The DoD ManTech program is a highly versatile R&D investment program that can serve as that key focal point to bring attention and technological resources to bear on the DoD's most pressing requirements for affordable modernization and sustainment. It ensures the health and resilience of the defense industrial base—thousands of diverse companies providing products and services, directly and indirectly, to national security agencies.

ManTech is an increasingly critical underpinning of the DoD's strategy to affordably develop, produce, field and maintain high-quality equipment and systems to meet 21st-century national security challenges. The DoD ManTech program does just that—bringing affordable, defense-critical manufacturing technologies to acquisition and sustainment managers and bridging the gap between technology discovery and the delivery of new capabilities to the warfighter.

More information and contacts can be found at www.dodmantech.com.



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