

The DoD Manufacturing Technology Program

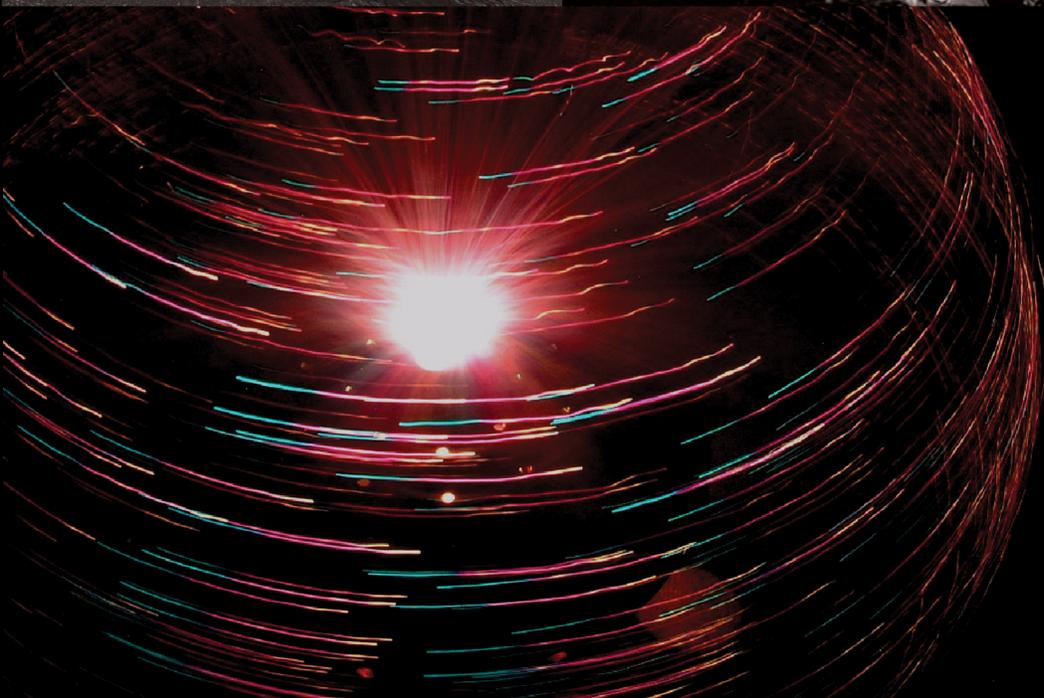
Strategic Plan

Delivering Defense Affordability

Executive Summary



March 2009





This is the Executive Summary of the Department of Defense (DoD) Manufacturing Technology (ManTech) Program Strategic Plan, dated March 2009. The full plan was prepared in response to Section 238 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2008, which added 10 U.S.C. 2521(e), requiring the Department to develop a five-year ManTech Program strategic plan that is to be updated biennially. The office of the Deputy Under Secretary of Defense for Advanced Systems and Concepts (ODUSD(AS&C)) prepared the strategic plan in close collaboration with the Joint Defense Manufacturing Technology Panel, comprised of ManTech Program leadership from each Military Department and participating Defense Agency.

The content and structure of this Executive Summary parallel the main chapters of the full DoD ManTech Program Strategic Plan. Additionally, the full plan offers a rich source of supporting information contained in several annexes. In particular, a detailed description of the organization, activities, and technology focus areas of the Department's component ManTech programs can be found in Annex C.¹

This Executive Summary, as well as the full DoD ManTech Program Strategic Plan, can be viewed and downloaded from the DoD ManTech Program web site at <https://www.dodmantech.com/>.



EXECUTIVE SUMMARY

For over 50 years, the DoD Manufacturing Technology (ManTech) Program has been the Department's investment mechanism for staying at the forefront of defense-essential manufacturing capability. This strategic plan is the Department's formal vehicle to unify and guide the ManTech community and support the broader defense manufacturing enterprise in delivering maximum value to the warfighter and the nation. The strategic planning process validated, through stakeholder interviews, ManTech's continued relevance in the coming years and squarely placed ManTech in the critical role of delivering affordability for defense acquisition and sustainment. This plan reinvigorates ManTech's central role within the DoD technology transition process with a renewed emphasis on the ManTech Vision and a formal statement of the ManTech Mission. These are then translated into four Strategic Thrusts and nine Enabling Goals to provide guidance and perspective for the Program.

STRATEGIC CONTEXT

Manufacturing is so important to the nation that the ManTech community is sometimes looked to as the champion for not only defense manufacturing technologies, but for the entirety of the defense manufacturing enterprise or even for enhancing US global manufacturing competitiveness. These larger topics go well beyond the charter of ManTech, but they form an important strategic context for ManTech planning. The ManTech program today exists in a strategic security environment of expanding DoD mission responsibilities and growing concerns about the affordability and responsiveness of defense acquisition and sustainment programs. Warfighter capability requirements, in turn, place demands on a defense industrial base that must be reliable, cost effective and sufficient in its response. Economic and policy analyses (including DoD's *2008 Annual Industrial Capabilities Report to Congress*) make clear that the dynamics of globalization and other

external drivers will increasingly shape the defense industrial base and the defense manufacturing enterprise. The growing intersection between commercial and military innovations has already created a climate in which the defense manufacturing enterprise must cope with the 21st century realities of widespread dependence on components from offshore suppliers. Defense manufacturing needs not only effective fabrication

and process technologies, but also effective design disciplines, globally collaborative networks, and a highly capable workforce. Industry has underscored this point with studies from such associations as the National Council for Advanced Manufacturing (NACFAM), Aerospace Industries Association (AIA), National Defense Industrial Association (NDIA), and others. A recent NDIA paper, for example, identifies seven serious manufacturing issues—technology, workforce, supply chain, facilities modernization, globalization, manufacturing and local economies, and environmental issues—that need national attention.² ManTech cannot solve all problems, but this Plan makes clear that the program should take this overall context into account when planning investments.



THE ROLE OF MANTECH

ManTech has a broad charter, both in statute and in DoD policy (DODD 4200.15), to improve the quality, productivity, technology and practices of businesses and workers providing goods and services to the DoD. The program’s vision and mission statements are similarly broad, and are framed to address wide-ranging needs for affordability and timely

delivery. The mission to anticipate and close gaps in defense manufacturing capabilities makes the program a crucial link between technology invention and industrial applications—from system development through sustainment—giving ManTech a unique identity within the extended defense enterprise. ManTech carries out its mission through programs in the Military Departments, participating Defense Agencies, and OSD. The program’s demonstrated ability to improve defense system affordability makes it a particularly potent tool in

Defense Manufacturing Vision:
A responsive, world-class manufacturing capability to affordably and rapidly meet warfighter needs throughout the defense system life cycle

ManTech Mission:
ManTech anticipates and closes gaps in manufacturing capabilities for affordable, timely, and low-risk development, production, and sustainment of defense systems.

the current budget environment. A recent report to Congress identified over 100 projects funded by ManTech in FY03 to FY05 that have resulted in implementations yielding a cost avoidance of more than \$6.3 billion. ³

The Deputy Under Secretary of Defense for Advanced Systems and Concepts administers and oversees the program through the OSD ManTech Director, with primary program execution at the Service/Agency level, and cross-component coordination via the Joint Defense Manufacturing Technology Panel (JDMTP). The JDMTP has an exemplary history of effective coordination at a technical level to ensure that programs are aligned with higher level objectives, that unnecessary duplication is avoided, and that investments have the greatest joint-service leverage.

The OSD ManTech Director and the members of the JDMTP adhere to four tenets in making policy and resource allocation decisions:

1. Address the highest priority defense manufacturing needs in the window of opportunity to make a difference.
2. Transition manufacturing R&D processes into production applications.
3. Attack pervasive manufacturing issues and exploit new opportunities across industry sectors.
4. Address manufacturing technology requirements beyond the normal risk of industry.

These tenets are applied in planning DoD ManTech investments that total over \$200M per year, as shown in the following table.

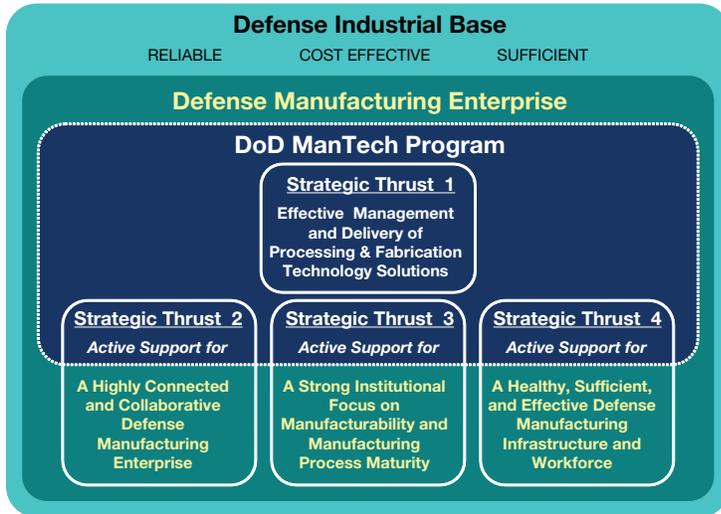
ManTech Funding, by Program Element (dollars, in millions)

PROGRAM	FY09 Approved	FY09 PB			
		FY 10	FY 11	FY 12	FY 13
DoD MS&T (PE 0603680D8Z)	18.4	14.9	19.9	19.9	24.8
Army ManTech (PE 0708045A)	91.1	69.6	70.2	71.7	73.4
Navy ManTech (PE 0708011N)	61.9	58.6	56.5	60.0	60.6
AF ManTech (PE 0603680F)	56.5	40.5	40.8	41.6	42.5
DLA ManTech (PE 0708011S)	55.3	20.8	21.3	21.7	22.0
MDA* (PE 0603890 YX29)	33.3	38.6	47.6	44.8	45.5
TOTAL**	283.2	204.4	208.7	214.9	223.3

* MDA line is the total for all Manufacturing and Producibility

**This total does not include MDA's budget for Manufacturing and Producibility

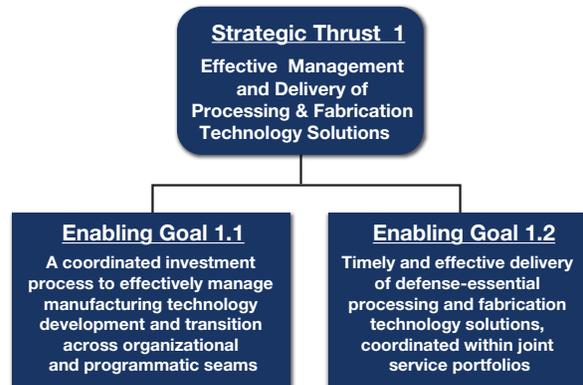
STRATEGIC THRUSTS AND GOALS



In keeping with its role to address needs in the larger context of defense manufacturing, ManTech has developed a strategy for the next five years that balances its traditional emphasis on processing and fabrication technology solutions with active support for broader defense manufacturing needs. Consequently, Strategic Thrust 1 is committed to manage and deliver processing and fabrication solutions in an area predominantly within ManTech’s span of control, recognizing that ManTech is the only DoD program that has this as its primary mission. Thrusts 2, 3, and 4 commit active support for enterprise level solutions, manufacturability and

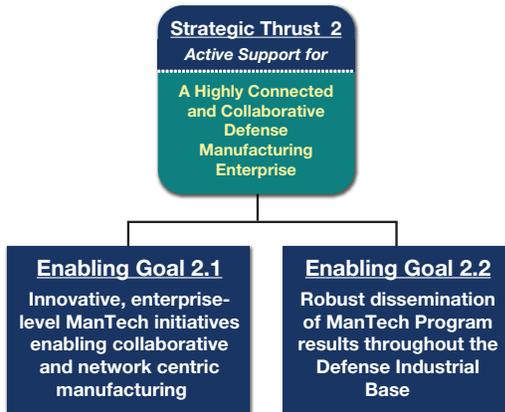
process maturity, and manufacturing infrastructure and workforce, respectively, and recognize it is beyond the program’s charter and resources to *fully* satisfy these thrusts. Goals are defined in all four strategic thrusts with sufficient description to enable focused action.

Strategic Thrust 1 in many ways represents the core focus of the program and drives the majority of program investment activity. It is supported by two enabling goals shown in the diagram to the right.



Goal 1.1 is to continuously improve a coordinated investment process ensuring ManTech Program adaptability and resilience, with a focus on successful transition. It recognizes the complexity of multiple organizational and programmatic interfaces across which increasingly mature manufacturing technologies need to be managed—for all phases of research, development, acquisition, and sustainment.

Goal 1.2 addresses the technical execution of the core ManTech Program, guided by the Goal 1.1 investment process. Technology portfolios are developed and managed by the Military Departments, Defense Agencies, and OSD using manufacturing roadmaps, analyses of defense system affordability drivers, and DoD determined priorities. The portfolios are coordinated by JDMTP joint-service technical subpanels.



Strategic Thrust 2 is the first of three program strategies applying to the broader defense manufacturing base. The cost and schedule of defense systems are driven primarily by activities “above the factory floor;” that is, in enterprise level processes, business practices and interactions with suppliers and with the government customer. 21st century defense manufacturing will rely on a networked, collaborative and increasingly global supply base, with capabilities that can be linked within and among the nodes to respond rapidly to dynamically changing defense needs.

Goal 2.1 encompasses the research, development, and implementation of capabilities which allow for a highly collaborative manufacturing environment among the multiple players in system development and production. Specific initiatives that fit include Model Based Manufacturing, Network Centric data environments, Collaborative Modeling and Simulation capabilities, and commercial practices within defense manufacturing. Each represents an innovative approach to enable stakeholders to collaborate at the enterprise level.

Goal 2.2 represents an important transition path for the results of research and development activities conducted by the ManTech program, primarily within Strategic Thrust 1. This deployment of program implementation results across the Military Departments, Defense Agencies, and industry helps to fully leverage the ManTech investment across the defense industrial base. In the best case, targeted dissemination resulting in subsequent transition into additional systems can help transform an innovative, initial manufacturing capability into a viable industry, thus benefiting all participants.

Strategic Thrust 3 points to the strategic need for a *pervasive culture of manufacturing* that embodies a cradle-to-grave focus, across DoD and industry, that persistently considers weapon system manufacturability and aggressively resolves associated production and sustainment issues over the Acquisition life cycle. This, in turn, maximizes opportunities to positively influence weapon system cost, schedule, and performance through manufacturing reviews appropriate for each phase of research, development and acquisition. This strategy seeks to drive a system-wide focus on manufacturing across these phases while ensuring that the central focus is sufficiently early in system acquisition for greatest benefit.



Goal 3.1 encompasses the development and maintenance of a body of knowledge sufficient to support the implementation of manufacturing readiness as a management criterion. A required element for this strategy is a strong institutional focus on manufacturing readiness. This will necessitate a validated scale of Manufacturing Readiness Levels (MRLs), an assessment process, and subject matter expertise to assist in performing manufacturing readiness assessments.

Goal 3.2 embodies the overarching objective of a strong institutional focus on manufacturability and producibility across the full defense acquisition framework. The full integration of “Design for Manufacturability” requires partnership with the technical community in combination with standardized practices appropriate for DoD and industry.

Goal 3.3 addresses the need to understand the highest priority opportunities for targeted manufacturing cost reduction, both within major defense systems and across multiple product lines. This is an important goal that directly supports the program’s defense affordability improvement objectives, and feeds into Goal 1.1.



While the DoD ManTech Program is not structured to be solely responsible for meeting the broader industrial base needs in **Strategic Thrust 4**, it is a vital enabler for a highly effective defense manufacturing enterprise, and DoD policy requires the ManTech Program to promote the key attributes supporting these needs. Doing so is in ManTech’s best interests. A healthy, sufficient, and effective defense manufacturing infrastructure, manned by a flexible, innovative and capable defense manufacturing workforce, underpins the ManTech Program’s mission effectiveness and broader industrial preparedness in multiple ways.

The objective of **Goal 4.1** is to actively promote sufficient government and industry investment in new U.S. plants and equipment as well as in manufacturing management innovations, such as Lean and Six Sigma, all in support of industrial preparedness. Sustained achievement of this goal reduces the cost and risk of advancing and applying new and improved manufacturing technology.

Goal 4.2 supports a highly capable, well-trained and well-educated U.S. defense manufacturing workforce, including effective use of knowledge management for defense-essential manufacturing skills, and active support for a strong national manufacturing workforce. This goal has several aspects, aligned primarily with specific sectors of the defense manufacturing workforce, addressing both organic defense as well as non-organic/national workforce initiatives.

MECHANISMS FOR ASSESSING PROGRAM EFFECTIVENESS

Assessing ManTech Program effectiveness is essential for its proper management, coordination and oversight. Program effectiveness is assessed through various mechanisms at three levels in the ManTech Program's governance structure:

- At the execution level, within each Military Department and participating Defense Agency
- At the portfolio coordination level, by the JDMTP and its subpanels
- At the policy and oversight level, within the Office of the Secretary of Defense (OSD)

Annual reviews of these ManTech programs are conducted to ensure that each project is planned with specific cost, schedule, performance and technology transition objectives, and that each project has milestones for in-process reviews by the government program manager to assess progress toward the project objectives. Annual portfolio reviews by the JDMTP subpanels provide strong peer review of technical metrics and progress. At the program manager level, a transition plan is coordinated between the ManTech project team and the primary transition target (Acquisition PM/PEO, depot, logistics center, shipyard, company, or industry sector). Progress is tracked, project by project, through successful transition, and is reported through the ManTech governance structure.

CONCLUSION

The DoD Manufacturing Technology Program has historically demonstrated its value, not only through process technologies that make new products possible, but also through manufacturing process improvements that get at the heart of defense system affordability challenges. The dynamics of the 21st century manufacturing environment are blurring the boundaries of traditional defense manufacturing concerns, and forcing a more global perspective. The DoD ManTech program has adopted strategies and goals that will preserve its well-established focus on advancing fabrication and processing at the shop floor, and at the same time actively support advances at the enterprise and supply chain level, in design and manufacturing maturity assessments, and in the manufacturing workforce. The budgets, execution and oversight mechanisms are in place to implement these strategies. The result will be even greater realization of the vision of *“a responsive, world-class manufacturing capability to affordably and rapidly meet warfighter needs throughout the defense system life cycle.”*

ENDNOTES

1. Annex C in the full strategic plan contains two parts. Part I is a detailed description of the DoD ManTech Program and supporting policies and processes. Part II summarizes the technology and investment focus areas of the Department's component ManTech programs and related manufacturing activities, namely: (1) the Defense-wide Manufacturing Science & Technology Program; (2) the Army ManTech Program; (3) the Navy ManTech Program; (4) the Air Force ManTech Program; (5) The Defense Logistics Agency (DLA) ManTech Program; (6) the Missile Defense Agency Producibility and Manufacturing Program; and (7) the Defense Advanced Research Projects Agency's (DARPA) manufacturing-related programs and activities.
2. National Defense Industrial Association (NDIA) white paper, "Maintaining a Viable Defense Industrial Base," August 1, 2008.
3. Report to Congress on Implementation of DoD ManTech Projects Receiving FY03-FY05 Funds. Department of Defense. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. 2008

