Vision: Integrated approach from S&T basic research through industrial base preparedness (6.1 through 6.3) to address manufacturing and affordability in manufacturing for DoN systems

<table>
<thead>
<tr>
<th>6.1 – Manufacturing Science</th>
<th>6.2 – Mfg Applied Research</th>
<th>6.3 - Mfg Technology (ManTech) Program</th>
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<tbody>
<tr>
<td>Novel manufacturing technologies and control methods to produce critical new and replacement parts on-demand</td>
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<td>– Cyber-Enabled Manufacturing Systems for Direct Digital Manufacturing (CeMS-DDM)</td>
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<tr>
<td>Scale-up and development of emerging manufacturing process innovations for product-related S&amp;T programs (FNCs) to reduce cost of fielding new capabilities</td>
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<td>– Azimuth and Inertial MEMS Disk Resonator Gyros</td>
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<td>– Fuel Cell Producibility</td>
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<tr>
<td>Acceleration of manufacturing technologies to reduce total ownership costs for DoN systems. Focused on acquisition cost reduction for 5 key acquisition platforms.</td>
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Mission: Industrial Preparedness

- Development of enabling manufacturing technology -- new or improved processes -- for implementation on DoD weapon system production lines

- DoD 4200.15 states investments should:
  - Transition emerging S&T results to acquisition programs
  - Improve industrial capabilities in production, maintenance, repair and industrial base responsiveness
  - Advance manufacturing technology to reduce cost, improve performance, and responsiveness

Funding: FY16 – approx. $57M
ManTech Requirements (DoD 4200.15, E2.1.3)

- Well-defined DoD requirement for the technology
- Technology demo’d in lab environment
- Can be delivered in time to meet the requirement
- Results applicable to more than one weapon system, component, or end item
- Specific plan to transition, implement, and insert results
- Potential for multiple Component-sponsored investments identified
- Investment not duplicative of other activities, both within and outside ManTech
ManTech Cannot Be Used For:

- Technology push, advancing general science
- Routine application of existing technology
- Implementation of manufacturing technology beyond the first-case application
- Product design (design for production analysis ok)
- Material development or optimization
- Purchase of off-the-shelf equipment (unless a minor portion of the investment and required to establish the first-case application of the ManTech deliverable)
- Purchase of capital equipment/facilities
- Component/system certification or qualification testing
- Technology proprietary to one company
ManTech Investment Strategy

- Addressing affordability (acquisition and life-cycle)

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<tr>
<th>Affordability Initiatives</th>
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<td>PEO (Subs)</td>
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<td>VIRGINIA ORP</td>
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</table>

- Investment Strategy focused on largest DoN acquisition programs as determined by:
  - Total acquisition funding
  - Stage in acquisition cycle (remaining years of acquisition)
  - Platform cost reduction goals
  - Cost reduction potential for manufacturing

ManTech - making a significant impact on affordability, highlighted by recent implementations and cost savings
Centers of Excellence

- Executed through Centers of Excellence (COEs)
  - Execute projects; manage project teams
  - Collaborate with acquisition program offices / industry to identify and resolve mfg issues
  - Develop and demo mfg technology solutions for identified Navy requirements
  - Facilitate transfer of developed technologies

COE Legend

Contracted
Government

Electro-Optics Center (EOC)
Operated by Penn State Univ
Freeport, PA

Navy Metalworking Center (NMC)
Operated by Concurrent Technologies Corporation (CTC)
Johnstown, PA

Institute for Manufacturing and Sustainment Technologies (IMAST)
Penn State University
State College, PA

Electronics Manufacturing Productivity Facility (EMPF)
Operated by American Competitiveness Institute (ACI)
Philadelphia, PA

Naval Shipbuilding and Advanced Manufacturing (NSAM) Center
Operated by South Carolina Research Institute (SCRA)
Summerville, SC

Electronics Manufacturing Technology Center (EMTC)
Naval Surface Warfare Center – Indian Head (NSWC-IH)
Indian Head, MD

COE Recompetes
- Metals – in source selection at ONR
- Composites – in source selection at ONR
- Electronics in source selection at ONR
Centers of Excellence – Core Competencies

• Metalworking –
  - Simulation & Modeling
  - Materials Processing and Fabrication
  - Near Net Shape Fabrication (including DDM)
  - Surface Treatment

• Institute of Mfg & Sustainment Tech (iMAST / REPTECH) –
  - Laser Processing
  - Materials and Composites Processing
  - Manufacturing Systems
  - Systems and Operations Automation
  - Sustainment / Repair Technologies

• Composites (CMTC) –
  - Automated Fiber Placement
  - Out of Autoclave Composites
  - Thick-Walled Composites
  - Vacuum Assisted Resin Transfer Molding
  - Controlled Volume Molding for High Temp Composites
  - Manufacturing Automation for Polymer Composites
  - Composites for Very Large Format Radomes

• Shipbuilding / Advanced Mfg (NSAM Center) –
  - Shipbuilding Technology
  - Process / Fabrication Optimization
  - Digital Work Instructions
  - Modeling
  - Spatial Scheduling
  - Inspection Technology

• Electro-Optics (EOC) –
  - Focal Plane Array & Sensor Technology
  - Fiber Optics & Photonics
  - Carbon Based Electronics
  - Window and Dome Technology
  - Lasers and Laser Weapon Systems

• Energetics (EMTC) –
  - Propellants
  - Munitions

Greg Woods – Prog Officer
Neil Graf – Prog Officer
Rich Henson – Prog Officer
Paul Huang – Prog Officer
Chuck Painter – NSWC – Indian Head
Focus on Implementation

• **ManTech, alone, cannot ensure implementation …**
  • Need ONR / COEs / industry / Program Office all working together

• **Technology Transition Plans (TTPs) for each project**
  – Upfront agreement by all parties as to required actions / responsibilities from technology development through implementation (includes required resources for implementation)
  – Signed by Navy ManTech, COE Director, Industrial Facility Management, Program Office, and, if appropriate, the government technical authority

• **Implementation Risk Assessment / Management Process**
  – Recognize risks to implementation upfront and assess / manage through project execution
  – Risks discussed during Program Reviews to ensure ManTech on same page as acquisition / industry stakeholders

*ManTech goal is technology implementation*
Industry Role

- **Participate in annual planning effort with COEs**
  - Identify manufacturing issues COEs can help address
  - Scope out / refine candidate projects
  - Provide input to ManTech planning deliverables
  - Provide input to Project Plan
  - Ensure commitment to implement - identify implementation requirements and identify resources
  - Help develop project Technology Transition Plan (TTP)

- **Obtain management signature on Technology Transition Plan (TTP)**

- **Execute project with COE**
  - Execute per Project Plan
  - Participate in project meetings / discussions as required

- **Participate in semi-annual platform Program Reviews**
  - With COE, brief project

- **Provide input on affordability / implementation / banked savings**

Active industry participation critical for success
Navy ManTech Web Site

  - Project Book (snapshot of all projects active during past FY)
  - Points of Contact Directory

- **Navigation** – [www.onr.navy.mil](http://www.onr.navy.mil); click on “03T Transition” under Directorates heading; and click on “Manufacturing Technology”