



# **Navy ManTech Program Impacting Key Platform Affordability and Availability**

Neil Graf

Manufacturing Technology (ManTech) Program

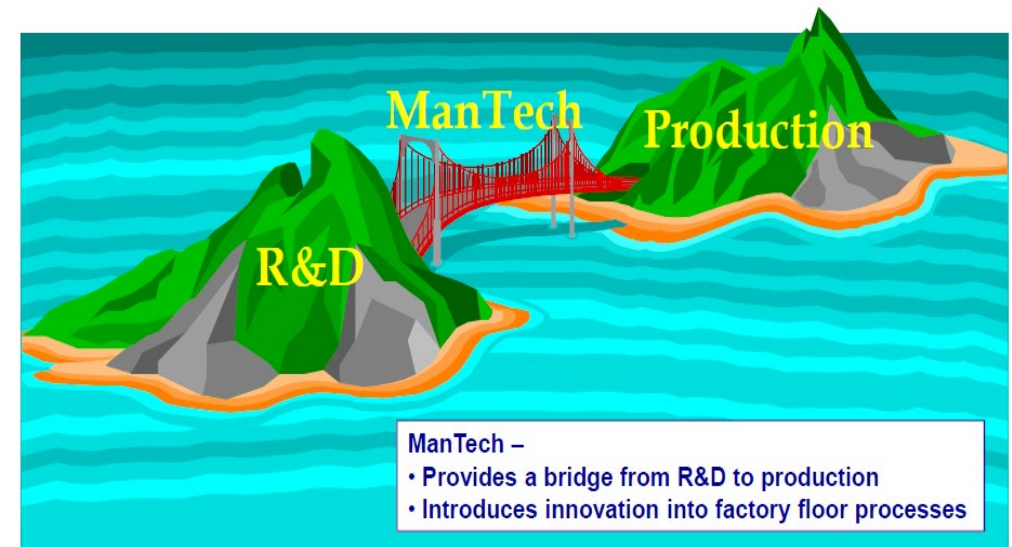
Code 332

*26 Feb 2025*



# PE 0603680N – Manufacturing Technology (ManTech)

- **Established USC Title 10, Section 4841**
- **Mission: Industrial Preparedness**
  - Development of enabling manufacturing technology -- new processes and equipment -- 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 and improve performance and responsiveness
- **Execution:**
  - ManTech Centers of Excellence (COEs)
- **POCs:**
  - ONR Program Officers / COEs





# ManTech Requirements and Restrictions

## Requirements (DoD 4200.15, E2.1.3)

- Well-defined DoD requirement for the technology (“Tech Pull”)
- Technology demonstrated 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 investigated
- Investment not duplicative of other activities, both within and outside ManTech

## Restrictions (DODD 4200.15 E.2.2 and other sources)

- Routine application of existing technology
- Investments specifically intended to change an end item's design
- 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 facilities
- Implementation of manufacturing technology beyond the first-case application
- A technology application unique to a single weapon system
- General Technology Development (Tech Pull/No Specific Requirement)
- Materials Development
- Component/system certification or qualification testing
- Technology proprietary to one company



# Navy ManTech Organization

Updated: 12 Nov 2024

## Code 33 – Sea Warfare and Weapons Department

**Legend**

- ONR
- Detailee / Tech Support
- Contractor Support

**Vacant / Rotating**  
ONR 33 Department Head

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**Dr. Jennifer Wolk**  
Code 332 – Adv Naval Mat’ls and Systems  
Division Director

**Neil Graf**  
ManTech Lead / Program Officer  
Composites Manufacturing Lead

**Paul Huang**  
Program Officer  
Manufacturing Enterprise Lead

**Dr. Jeffrey Farren**  
Program Officer  
Metals Manufacturing Lead

**William Crespo**  
Program Officer (Acting)  
Electronics Manufacturing Lead

**COR:**  
- CMTC  
- EMTC

**ManTech Portfolio Manager:**  
- Capability Acceleration  
- Air Platforms (Affordability)  
- Ship Platforms (Affordability)

**JDMTP Navy Principal**

**COR:**  
- NSAM  
- iMAST

**ManTech Portfolio Manager:**  
- Sustainment

**JDMTP AME Subpanel**

**MII Support (MxD / ARM)**

**Guest Researcher at NIST**

**COR:**  
- CNM

**JDMTP Metals Subpanel**

**NSWCCD Coordination**

**6.2 Development Lead**

**MII Support (LIFT)**

**COR:**  
- EMC  
- EOC

**ManTech Portfolio Manager:**  
- PEO (IWS)

**JDMTP Directed Energy  
Technical Working Group**

Gina Walker  
Ellen Reed  
Megan Gavarkavich  
Stephanie Marsh  
Stephen Gilligan  
Miranda Fleck  
Kassia Rivera  
Joana Haizel-Cobbina  
Contracts – ONR Code 253

Kelsey Harrison (NAWC-AD)  
Stan Ng (NAWC-AD)  
Additional Government Support

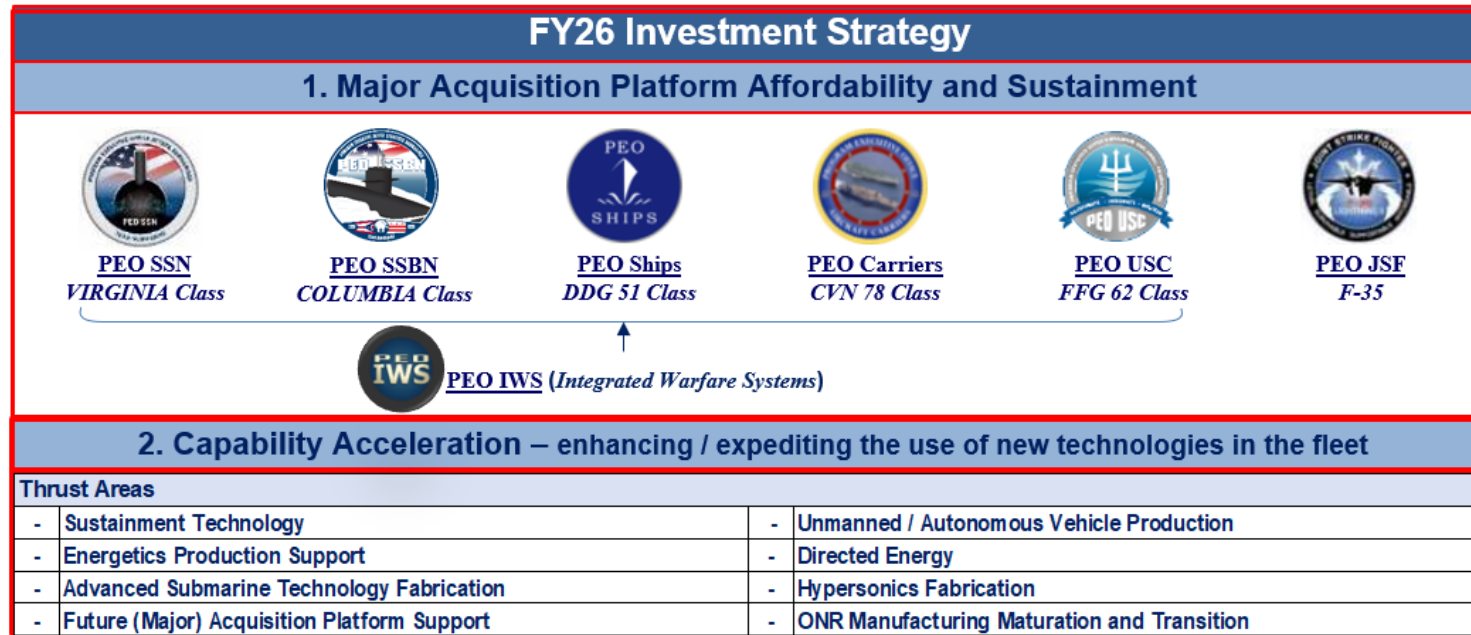
Sarah Mitchell  
Denise Piastrelli  
Sabrina Hogan  
Karen Brown  
Gabe Puentes-Lay  
Prince Adu-Jamfi  
Matt Vincent  
Don Szczur  
Rob Akans  
BCS Allegiant Team



# Manufacturing Technology Program – FY26 Investment Strategy –

## AT A GLANCE

Funding executed in two major areas – (1) Major Acquisition Platform Affordability and (2) Capability Acceleration, in close coordination with acquisition program offices, depots and shipyards, industry, NRE, Navy Labs, and Technical Warrant Holders.



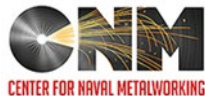
## WHY IS THIS IMPORTANT

- **Platform Affordability** – ManTech has a significant role in providing cost savings to major acquisition platforms. Close coordination with acquisition program offices and industry ensures implementation on production lines.
- **Capability Acceleration** – ManTech’s manufacturing expertise allows for rapid manufacturing maturation to benefit both S&T and acquisition programs to get capabilities to the fleet faster.

# COEs – Core Competencies

- **Metalworking**

- Joining Technologies
- Metals Manufacturing Processes
- Robotics and Automation
- Inspection Technologies
- Manufacturing Technology / Industrial Base Infrastructure



- **Program Officer: Dr. Jeffrey Farren**

- **Composites**

- 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



- **Program Officer: Neil Graf**

- **Manufacturing & Sustainment**

- Laser Processing
- Materials and Composites Processing
- Manufacturing Systems
- Systems and Operations Automation
- Sustainment / Repair Technologies



- **Program Officer: Paul Huang**

- **Shipbuilding & Advanced Manufacturing**

- Shipbuilding Technology
- Process / Fabrication Optimization
- Digital Work Instructions
- Modeling
- Spatial Scheduling
- Inspection Technology
- Sustainment



Naval Shipbuilding and Advanced Manufacturing  
CENTER OF EXCELLENCE

- **Program Officer: Paul Huang**

- **Electronics**

- Automated Packaging
- RF Technology
- Wide Band Gap Technology
- Environmental Issues



ELECTRONICS  
MANUFACTURING  
CENTER

- **Electro-Optics**

- Focal Plane Array & Sensor Technology
- Fiber Optics & Photonics
- Image Processing and Inspection Systems
- Optics and Coatings
- Lasers and Laser Weapon Systems
- Laser Micromachining



ELECTRO-OPTICS  
CENTER

- **Program Officer: Will Crespo**

- **Energetics**

- Propellants
- Munitions



- **Program Officer: Neil Graf; NSWC IHD: Lori Nock**



# 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**



# FY26 Planning Cycle – Top Level –

- |  |   |             |
|--|---|-------------|
| 1. FY26 Kickoff  |   | Q3 FY24     |
| 2. Acq PM / Industry / COE Candidate Project Generation Mtgs * / *** |   |             |
| a. PEO IWS Idea Forum * / ***  | } |             |
| b. F-35 Idea Forum / CA Topics * / ***                               |   | Q3 FY24     |
| c. Combined Shipyard Idea Forum * / ***                              |   |             |
| d. COE Assignment and Gate   |   | Q3 FY24     |
| 3. Program Officer / COE Candidate Project Review                    |   | Q4 FY24     |
| 4. Program Office / PEO / External Stakeholder Review ***            |   | Q4 FY24     |
| 5. FY26 Government Planning Meeting                                  |   | Q1 FY25     |
| 6. Resolution of Outstanding Questions * / ***                       |   | End Q1 FY25 |
| 7. Approved Prioritized Plan per Platform ***                        |   | Q2 FY25     |
| 8. Project Proposal Phase *  |   | Q2-Q3 FY25  |
| 9. Proposal Review / Approval  |   | Q4 FY25     |
| 10. Project Initiation (FY26 Projects)                               |   | Q1 FY25     |

\* Industry Input  
\*\*\* PEO / Program Office Input





# Stakeholder Engagement

- **Active Engagement:**

- With Navy stakeholders throughout the year – in planning, project execution and reviews, and affordability assessments
- With other Navy technical experts (Tech Warrant Holders, ONR / NRE personnel) as well as other Service / OSD manufacturing technology experts

- **Reviews:**

- Affordability Platform / IPT Reviews (IPTs at least twice per year) – Program Office personnel and industry partners
- JDMTP Portfolio Reviews (by subpanel annually) – technical experts from Services / OSD
- ONR Annual Portfolio Reviews (by COE) – technical experts from ONR / NRE



# Recent Highlight: Deep Hole Drilling

- Developed a prototype tight-tolerance, deep-hole drilling tool
- Reduced Newport News Shipbuilding (NNS) and Bath Iron Works (BIW) labor to drill reduction gear holes by 60%
- Eliminated rework for misaligned holes by 100%
- Reduced maintenance repair costs by 50%
- Implemented in FY24
- Estimated combined five-year savings of \$4.5M for both NNS and BIW





# Recent Highlight: Machine Learning and Schedule Optimization

- Integrate automated schedule optimization and machine learning into “Shipyard AI” to support more robust schedules
  - Closer centers (shorter overall time spans for blocks of vessels)
  - Enhanced communication with internal supply chain management departments
  - Reduced time required to generate a viable and executable capacity plan
  - Optimized capacity plans with respect to Safety, Quality, Cost, and Schedule
- Additional ancillary benefit is FMM and other shipyard users will also benefit from updates to the Shipyard AI tool for their process

## Project Benefits

- Model precision up to >90% for ranking top 5 locations across all instances
- Model can predict historical locations with >71% precision (Top 1) across all instances
- 5-year savings:

CVN: \$7.25M	VCS: \$4.99M	CLB: \$3.35M
DDG: \$1.96M	LPD: \$1.41M	LHA: \$1.76M

Navy ManTech  
Investment:  
**\$1.99M**

Combined  
5-year Savings:  
**\$20.7M**

Combined 5-year  
Return On Investment:  
**10.43**



Incorporate Machine Learning to enhance legacy tool capability to provide rapid, efficient allocation of shipyard resources

<p><b>ERP Connection</b></p> <ul style="list-style-type: none"> <li>• Connect directly to organization ERP to acquire up-to-date schedule data for better-informed and more precise model</li> </ul>	<p><b>Model Validation</b></p> <ul style="list-style-type: none"> <li>• Provide automated, model-based validation of the ship construction models and all input data to alert the user of constraint violations</li> </ul>	<p><b>Machine Learning</b></p> <ul style="list-style-type: none"> <li>• Apply machine learning techniques to historical placement data to learn the business rules and create an 'automated capacity planner'</li> </ul>	<p><b>Sim-Based Optimization</b></p> <ul style="list-style-type: none"> <li>• BBAl's sim-based optimizer links proprietary simulation technology with a genetic optimization algorithm to identify savings for user established objectives</li> </ul>	<p><b>Recommendations Report</b></p> <ul style="list-style-type: none"> <li>• Provide clear and concise recommendations based on automatically identified conflicts</li> </ul>	<p><b>Decision Tools</b></p> <ul style="list-style-type: none"> <li>• Better understand the health of current projects and provide 'single source of truth' for support organization to support production</li> </ul>
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# Digital Transformation in Shipbuilding

## Issue:

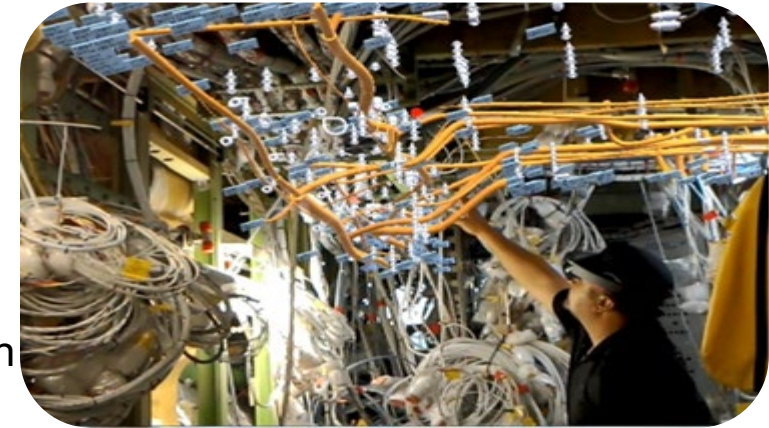
- Manual, paper-driven shipbuilding processes result in inefficiencies and increasing fabrication labor and costs
- Significant improvement with moving to digital workflows

## Benefits:

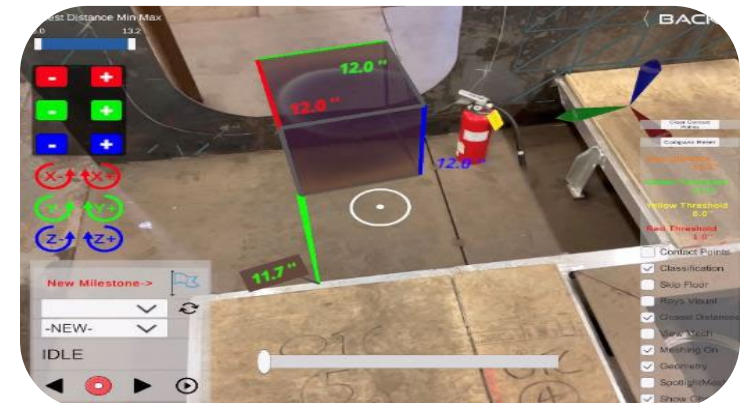
- Newer digital technologies and ship designs generate significant digital data that can be repurposed and reused to optimize construction workflows
- Increased digital thread use established by model-based designs / processes enables future improvements and efficiencies
- Leverage benefits of digital transformation in automotive and aerospace manufacturing by applying relevant tech towards shipbuilding processes

## Impact:

- 57 projects since Q1 FY16 (completed and active)
- \$70.5M Navy ManTech investment
- Platform cost savings:
  - VCS - \$14.8M/hull
  - CVN - \$11.2M/hull
  - CLB - \$15.0M/hull
  - DDG - \$31.5M/hull
  - For Ingalls implementations, additional \$26.9M benefits extend to LHA, LPD, and NSC
- **\$365.6M in aggregated savings within 5 years of technology implementation**
- \$1.55B+ in est. savings over Navy's 30-year build plan



*Improved Cable Installation and Testing (S2975)  
Improving efficiency for installing and testing cable through the use of Augmented Reality*



*Virtual Load Out Interference Removal (S2899)  
Integrating mixed reality technologies with as-built ship conditions and CAD product data to detect interferences in real time assessments of equipment load outs or removals to determine minimally necessary rip out requirements.*

**Electric Boat, Newport News, Ingalls, and Bath Iron Works - Partners in Digital Transformation**



# Navy ManTech's Sustainment Efforts

- **Advance cutting-edge repair and sustainment technologies to maximize the readiness and resilience of Navy systems**
- **Prioritize flexibility to ensure responsiveness to critical needs**
- **Execute sustainment strategy through the following:**
  - Affordability Efforts are focused on reducing acquisition cost but many also impact sustainment
  - Capability Acceleration efforts to deliver capability to the warfighter more rapidly
  - Repair Technology program located at iMAST – portfolio of ManTech / RepTech projects with naval shipyards, air and Marine Corps depots, and industrial base focused on improving depot maintenance processes and reducing availability span times

# COE Affordability Project – Large Diameter Ball Valve Improvements

- Current coating on large diameter submarine seawater valve balls fails prematurely, resulting in calcareous deposits from marine growth, high operating torque conditions, and emergent repairs at significant cost
- Developing a life-of-boat ceramic coating that can be applied to both in-service and new construction valve balls
- New ceramic coating is expected to result in a total estimated life-cycle cost savings of >\$100M for VCS and CLB, with additional savings for other submarine classes possible

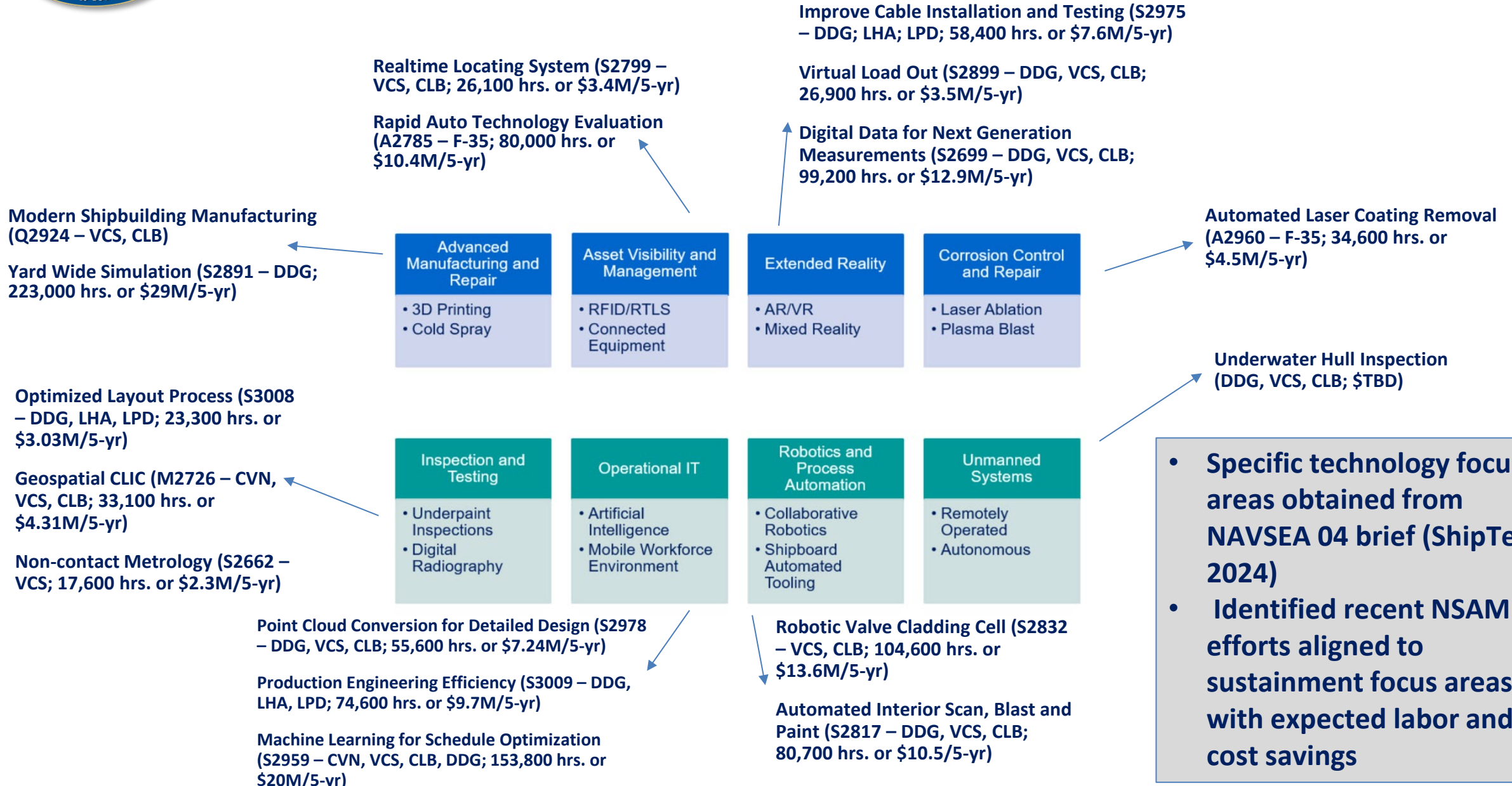


VCS Seawater System Large Diameter Ball Valve Improvements





# Sustainment Efforts Completed by Navy ManTech



- **Specific technology focus areas obtained from NAVSEA 04 brief (ShipTech 2024)**
- **Identified recent NSAM efforts aligned to sustainment focus areas with expected labor and cost savings**



# Navy ManTech Repair Technology (RepTech) Program



- RepTech, a subset of Navy ManTech managed by the iMAST COE, aids the Navy with life-cycle cost reduction in support of shipyards and DON depots across the Navy's repair enterprise: NAVSEA, NAVAIR, MARCOR
- Develops and transitions new and emerging technologies that reduce repair/maintenance costs, reduce turnaround time for critical sustainment activities, eliminate unsafe work practices, and augment an aging, as well as inexperienced workforce
- Coordinates with Navy ManTech COEs, the joint depot community, DoD industrial activities, industry, PEOs and university laboratories to improve sustainability, reliability and system availability

### Stakeholders:

PMS 392, PMS 396, PEO Carriers F-35 JPO, USMC

### Platforms Supported:

VCS, CLB, CVN, F-35, CH-53, LAV, JLTV

### Depot Locations:

PNSY, PSNSY, NNSY, PHNSY, MDMC-Albany, NAVAIR FRC E, SE, SW

### RepTech Working Group (RWG):

Representatives of NAVSEA 04, NAVAIR COMFRC, and MARCOR SYSCOM

### Projects Active and Recently Completed:

- RT2837 Submarine Large Diameter Ball Valve Improvement
- RT2923 Laser Ablation for NAVAIR
- RT2992 Powder Blown Laser Directed Energy Deposition Repair
- RT2998 SPEE3D for Rapid, Low-Cost Additive Manufacturing
- RT3025 Laser Ablation of Armored Vehicles
- RTR3029 CFOAM Tooling for Aviation Composites
- RT3049 Modernizing Shipchecks to Enable the Digital Twin (FY25 new start)
- RT3050 Health Management Enabled POTS-PATS (FY25 new start)
- RT2964-2 S51 Motor Generator Rewind Optimization – Phase 2 (completed)
- RT2914 Shopfloor Control at USMC Albany Depot (completed)
- RTR3019 SHT Hole Removal and Plug Replacement Improvement (completed)

### Annual Funding: \$2-3M/year

### Major Benefit:

- Fleet Readiness
- Reduction in life-cycle costs

### Life-Cycle Affordability:

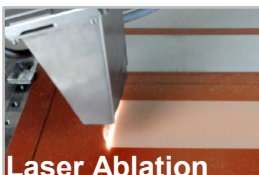
- Est. future 5-year cost reduction ~\$150M

### Cost Avoidance:

- Improved efficiency and schedule – faster delivery to warfighter
- Reduced material erosion
- Hands-on training and Migration Plan for existing systems
- Repair components that do not have existing repairs
- Reduction of hazardous waste generated
- Reduction of consumables (chemicals and PMB, sanding pads)
- Reduction of worker injuries



Additive Mfg



Laser Ablation



HP Water Jet Blasting



Thermal Spray Repair





# Want More Information?

- **Visit Navy ManTech and COE Booths Here at NSRP APM**
- **Pick Up Information Sheets Here at NSRP APM**
- **Contact COE or Program Officers**
- **Attend Defense Manufacturing Conference 2025**
  - **17-20 November 2025**
  - **Orlando, FL**



# Backup



# Industry Role

**Active industry participation also critical for success**

- **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 Program Reviews**
  - With COE, brief project



# Program Office Role

**Active Program Office participation critical for success.  
ManTech, alone, cannot ensure implementation.  
Need ONR / COEs / industry / Program Office all working together**

- **Participate in annual planning effort**
  - Motivate relevant industry partners to participate
  - Participate in planning process - pre-screen candidate projects for applicability, implementation potential, and cost savings potential (Jul-Dec timeframe)
  - Provide Program Office ranking/approval of candidate projects (Jan-Feb timeframe)
- **Review and sign project Technology Transition Plans (TTPs)**
- **Participate in portfolio Affordability Assessment process and provide PO concurrence twice annually**
- **Participate in semi-annual Program Reviews**
  - Help coordinate and review portfolio
  - Provide Program Office Implementation Risk Assessment info real-time after each project is reviewed
  - Hosted approx. 50% at COEs / 50% industry
- **PO technical representatives participate in project meetings / discussions as required**