



COLLABORATION THAT WORKS

Surface Engineering Technologies Workshop

OCTOBER 10, 2017



Machining



Aerospace



Automotive



Robotics



Defense



Energy



Electronics



Government



Academia



Telecom



Environment



Business



Computers



Internet



Investment



Consumer



Sensors



Infosec



Analytics



Biochem



Collaborative R&D
 Industry Intelligence
 Technology Strategy
 B2B Networking
 Commercialization
 Strategic Planning
 Public Contracts
 IP Protection

GOVERNMENT COLLABORATIONS



- Collaborative programs, partnerships, and MOUs
- NCMS helps leverage non-traditional suppliers and bolster R&D
- Programs aligned with multiple ongoing Federal initiatives



CONTRACT VEHICLES



NAMC

DOT IDIQ

CTMA

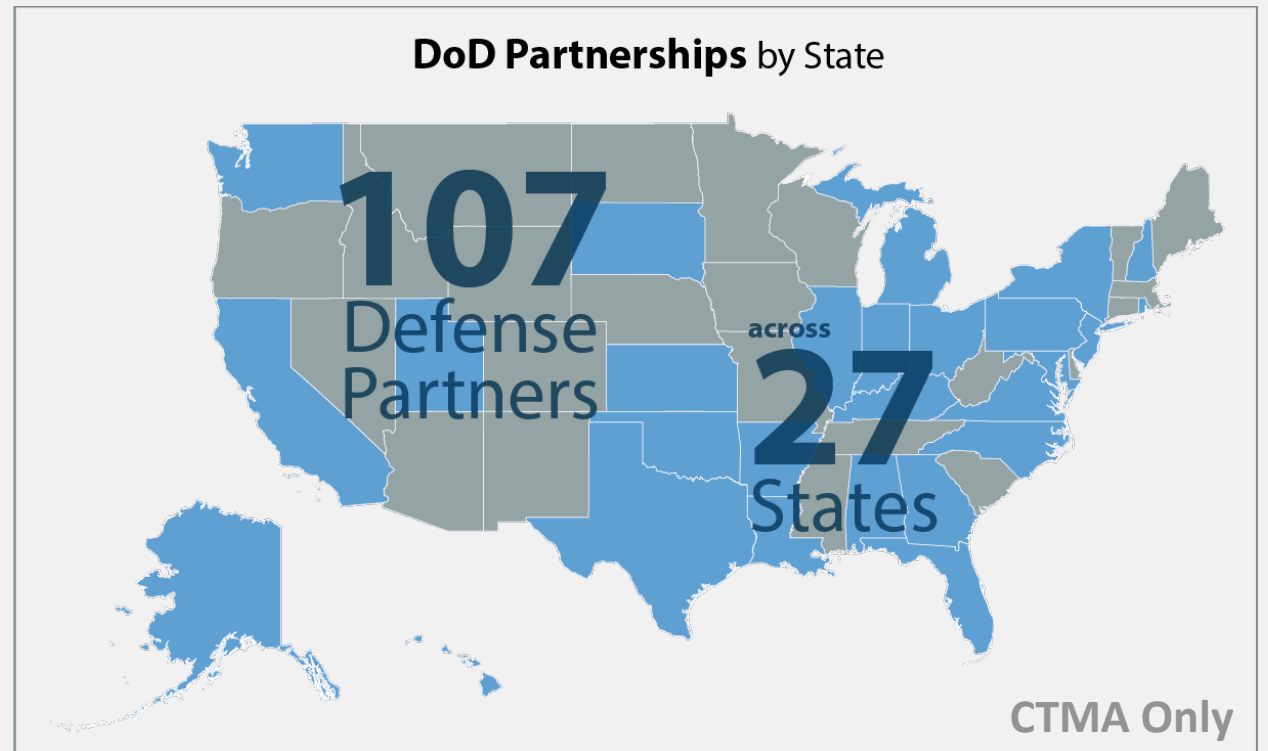
NCMS BREADTH & DEPTH

More than **350** APPLIED R&D Projects

Leveraged over **\$1.3** BILLION in project funding

“500” COMPANY Network

31 YEARS of experience





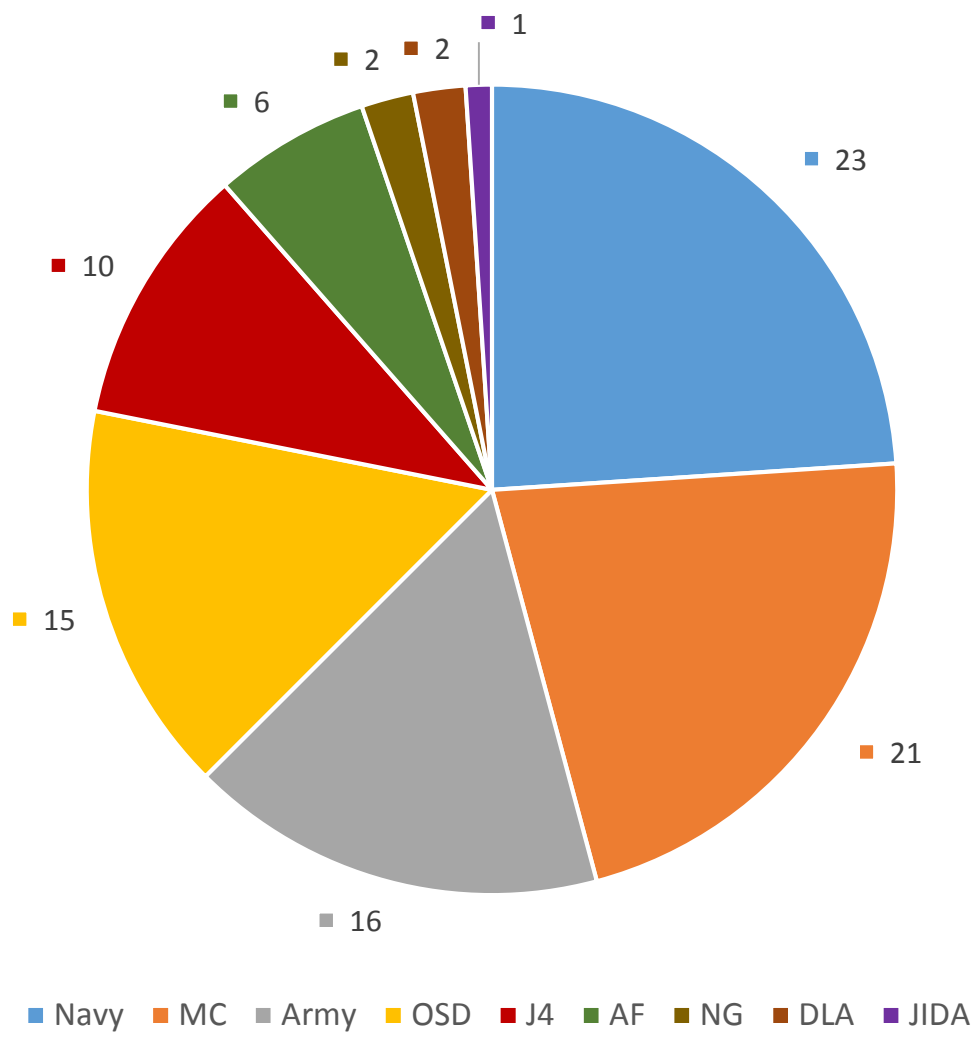
- Venue that streamlines the process
- Existing cooperative agreement with broad applicability
(FAR compliance not required)
- Military Interdepartmental Procurement Request (MIPR)
(Ease of funding transfer from services to the CTMA contract vehicle)
- MIPR normally accepted within 1 – 2 days
(At this point funds have been committed)
- Streamline CA 30 – 45 days
(Time that MIPR is issued to contract mod, funds have been obligated)

COOPERATIVE AGREEMENT





CTMA FEDERAL AGENCY SPONSORED PROJECTS

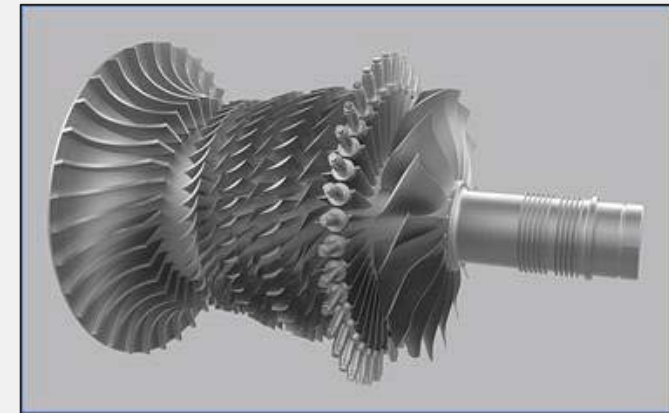


	Total	Aircraft Focused
Navy	23	4
Marine Corps	21	-
Army	16	-
OSD	15	2
J4	10	5
Air Force	6	6
National Guard	2	-
DLA	2	-
JIDA	<u>1</u>	-
Totals	96	17

SURFACE ENGINEERING



- T56 Series III, Air Force
- T56 Series IV, NAVAIR
- T55, Boeing, TAPO (Army)
- AGT1500 – Army
- T700 – NAVAIR



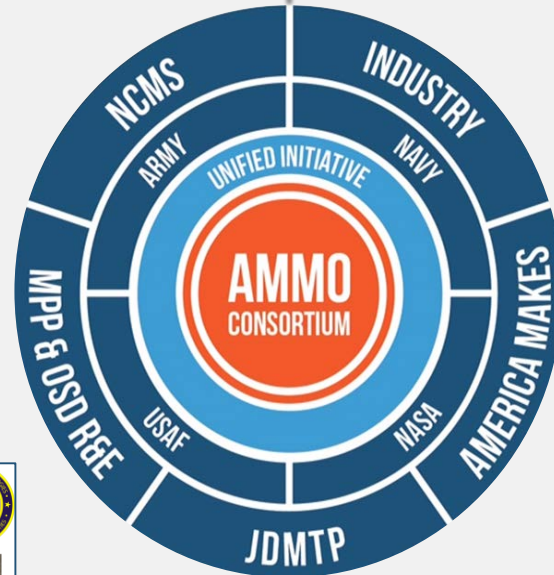
OTHER DOD RELATED ACTIVITIES

- 2017 DoD Advanced Composite Maintainers Technical Interchange Meeting (8/22-24, 2017, Hill AFB)
- NCMS-DOD Maintenance Innovation Challenge
- Monthly Joint Technology Exchange Group (JTEG) Call
 - 09/26/17: JTEG Tech Forum: Laser De-Paint / Automated Painting & De-painting
 - 10/31/17: JTEG Tech Forum: Point of Maintenance Aids
 - 11/28/17: JTEG Tech Forum: Big Data Analytics
 - 12/19/17: JTEG Tech Forum: Improved Business Processes

ADDITIVE MANUFACTURING

Additive Manufacturing Maintenance Operations

Real Parts
Real Repairs
Real Time



<p>RARE Parts Program Case Study Part <u>Suspension Arm</u> Weapon System <u>M1 Abrams Platform</u> Cost & Time Savings <u>40% Estimate</u></p> <p>Problem/Challenge: Abrams compensating idler arm is used on all Abrams battle tanks, the Assault Breacher Vehicle and the Joint Assault Bridge. It is a machined forging of 4000 series steel. Of all the features, only two surfaces wear.</p> <p>Solutions/Results: Worn surfaces were machined under size with wear resistant material and machined to dimensional requirements.</p> <p>Benefit/Impact: Forged and machined part require months to obtain a second source go out of business. Having a repair readiness option regardless of process assembly stopped due to a problem with production facility.</p> <p>Savings - Current cost \$2,000, repair \$800 each x 175 per year = \$140,000 New manufacturing time: approx. 40 wks Repair time: less than 1 week</p> <p>Weapon System - All Abrams tracked vehicles, Assault Breacher Vehicle, Joint Assault Bridge.</p> <p>Contacts/Learn More About It: Brian Anderson 256-235-6268</p>	
<p>RARE Parts Program Case Study Part <u>Transmission Fan Shaft</u> Weapon System <u>M1 Abrams Platform</u> Cost & Time Savings <u>10% estimate</u></p> <p>Problem/Challenge: Allison X-1100 series transmission is used in all Abrams platforms. Two cooling fan drive shafts on each transmission.</p> <p>Solutions/Results: Worn surfaces were machined under size with a wear resistant material and to drawing dimensional requirements repair replaces existing chemical process.</p> <p>Benefit/Impact: Environmental impact due to hexavalent chrome plating process.</p> <p>Time - Estimate the AM process is new cost. Procedure is not approved.</p> <p>Weapon System - M1 Abrams platform, Assault Breacher Vehicle, Joint Assault Bridge.</p> <p>Contacts/Learn More About It: Brian Anderson, 256-235-6268</p>	
<p>RARE Parts Program Case Study Part <u>Turbine Engine Components</u> Weapon System <u>M1 Abrams Platform</u> Cost & Time Savings <u>Average 50% Savings</u></p> <p>Problem/Challenge: During the 1990s the OEM for AGT 1500 turbine engine chose to discontinue production of this engine. Repair part cost increased, readiness became a substantial issue for M1 Abrams fleet.</p> <p>Solutions/Results: Use AM to dimensionally restore worn surfaces. Surfaces were machined under size, built up with a wear resistant material and machined back to drawing dimensional requirements.</p> <p>Benefit/Impact: Repair Processes currently on hold by TACOM pending an agreement with the new engine OEM, to replenish the supply system with new parts, replacing ones that have multiple repairs.</p> <p>Many parts were successfully repaired over two decades ago, currently equipment is idle.</p> <p>Weapon System - M1 Abrams platform, M1 maintank, Assault Breacher Vehicle, Joint Assault Bridge.</p> <p>Contacts/Learn More About It: Brian Anderson, 256-235-6268</p>	<p>Approved Repair Currently Suspended</p>



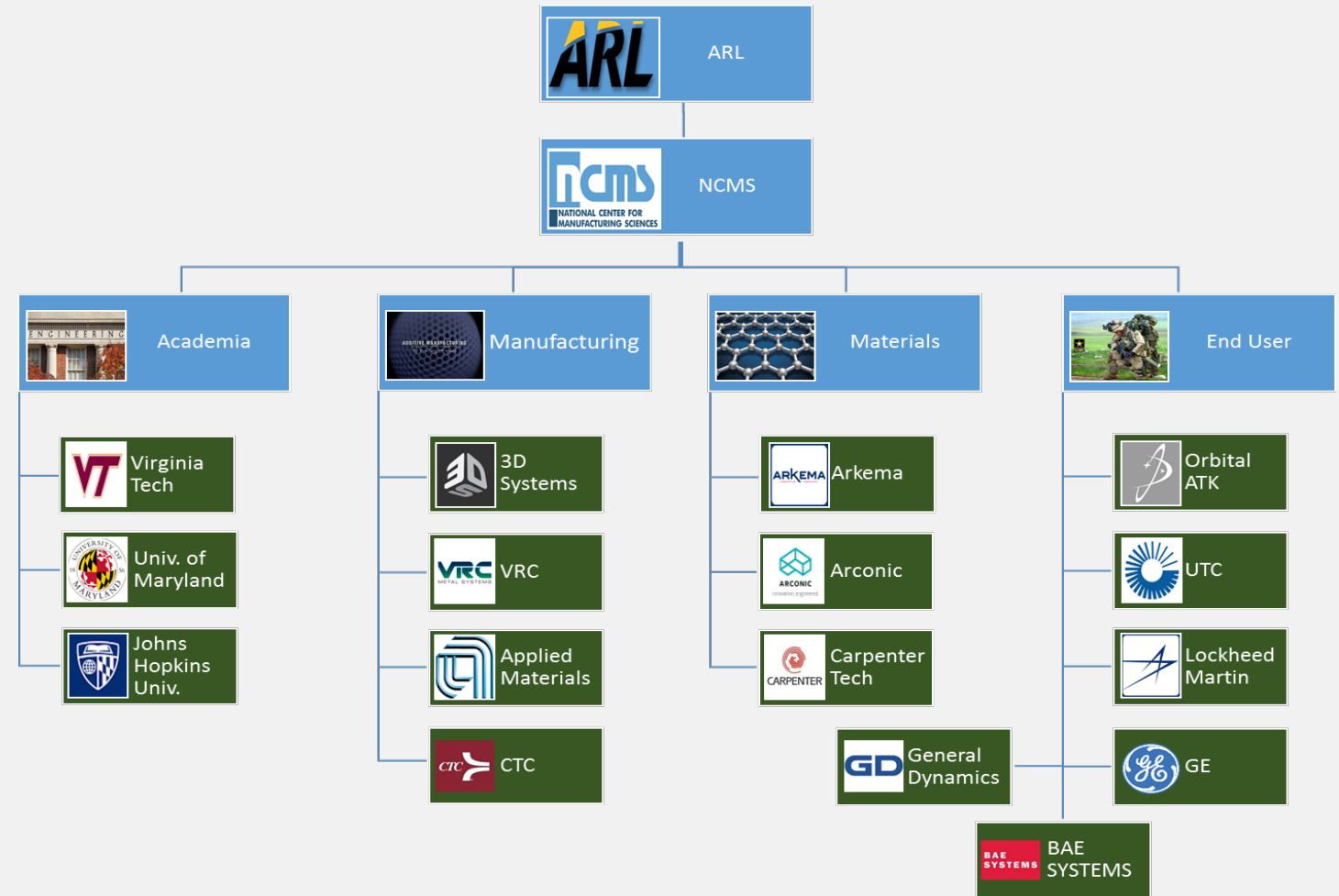
Lockheed Martin Corporation
Global Vision Center
Arlington, VA

Additive Manufacturing (AM)
Business Model Wargame II
Discovering Business Processes
Critical to Enabling AM

May 16-17, 2017

US ARMY – ADVANCED MANUFACTURING & PROCESSES (AMMP) CONSORTIUM

- **Unprecedented speed** in part production.
- **Novel weapon system** designs and materials (unattainable with current technology)
- **Dramatic cuts** in cost and delivery times.
- **Point-of-need** part manufacturing





EMERGING PROJECT WORKSHEET

Project Title	
The Need/Gap	
Project Vision	
Deliverables	
Work-flow (Steps and Duration)	
Cost "Best Guest"	
Industry Champion(s)	
Project Approach	
Participant Names and Contact Info	
Capable Technology Providers	

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Strategic Technology Workshop

WE ARE...

HOW CAN WE WORK TOGETHER?



THANK YOU

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