



# DoD Additive Manufacturing Update

*Ms. Kelly Visconti*

*Contractor, Manufacturing Technologies Office  
Office of the Under Secretary of Defense  
for Research and Engineering*

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# Overview



- **Why Additive Manufacturing?**
  - Modernize National Defense Systems
  - Increase Material Readiness
  - Enhance Warfighter Innovation and Capability
- **Department of Defense Strategic Approach to Additive Manufacturing**
- **Joint Additive Manufacturing Working Group and Standardization**





# Why Additive Manufacturing?



- **Modernize Defense Systems**
  - New geometries enabled by AM
  - Part reduction
  - Faster prototype and build cycles
  - ***Faster, lighter, stronger, more impactful systems***
- **Increase Material Readiness and Efficiency**
  - Address part obsolescence
  - Reduced logistics footprint
  - Rapid tooling and job aids
  - ***Increased system availability and lower cost***
- **Enhanced Warfighter Innovation & Capability**
  - Training and job aids
  - Innovative solutions in theater
  - ***More responsive and capable units***



SOURCE: Defense.gov



# DoD's Strategic Approach to Additive Manufacturing



## National Defense Strategy

### DoD Additive Manufacturing Strategy

- Provides a Department-wide vision and identifies strategic goals. (~FY20Q4)

### AM Policy DoDI & AM Guidebook

- Policy expands across W/S lifecycle & defines responsibilities. (~FY21Q1)
- Guidebook to provide more information and best practices. (~Draft FY21Q2)

### Implementation or Campaign Plans

- The plan for each Service or Agency identifying requirements, supporting activities and milestones in operationalizing AM. (FY21-22)

### Annual Joint Priority List

- Identification of common issues requiring, or that could benefit from, joint solutions by the JAMWG. (Annually in Q1)

### Budgets & Resource Allocation

- Sufficient resources are required to achieve the strategic goals and realize the vision. (Annual cycle)

Strategic



Operational





# DoD AM Strategic Goals



1. Integrate AM into DoD and defense industrial base.
2. Align AM activities across DoD and with external partners.
3. Advance and promote agile use of AM.
4. Expand proficiency in AM: learn, practice, and share knowledge.
5. Secure the AM Workflow.





# Joint Additive Manufacturing Working Group (JAMWG)

Across the DoD Enterprise: Research & Engineering, Acquisition, Sustainment and Logistics

## Organization:

Joint Defense Manufacturing Council

*SES/2Star - AM Overall Responsibility for org.*

Joint AM Working Group

*GG-15/AO Level/Org. Implementation Leads for AM*

Data & Model Sharing Council

Qualification & Certification Council

Education & Workforce Development Council

Subject Matter Experts

## Objectives:



## Outcomes:



## Opportunities:





# JAMWG FY20-21 Priorities



## 1. Accelerate qualification and certification of AM materials, machines and parts.

- Scope a joint AM Qualification data generation pathfinder project for metals.
- Execute pilot materials data federation project and scope a joint AM materials database approach if appropriate.
- Increase engagement with standards development organizations.
- Promote and transition R&D to mature AM technologies that will increase reliability and accelerate qualification.

## 2. Enhance a secure common digital thread across DoD and industry.

- Complete demonstration of Joint Additive Manufacturing Model Exchange (JAMMEX) system, roll out to users and define future requirements.
- Common Technical Data Package standard developed, accepted by all Services and published.
- Identify challenges and scope possible solutions to key cyber-physical security needs for AM across DoD.

## 3. Expand proficiency in AM: learn, practice and share knowledge.

- Identify common requirements, complete asset mapping and a path to fill in gaps with joint Education and Workforce (EWD) Development programs to support Service Implementation plans.
- Develop an artisan/technician certification program and share outcomes across DoD.

## 4. Develop DoD and supply chain integration policies and guidance.

- Publish DoD Instruction (Policy) on AM.
- Share and issue best practices for AM acquisition and cataloging.
- Provide policy and guidance to integrate the supply chain.

## 5. Improve internal and external communication effectiveness on AM.

- Publish DoD AM Strategy.
- Develop AM communication plan and utilize AM collaboration tools.
- Share information on metrics to capture value of AM and agree on common metrics.



# OUSD(R&E) Approaches



## Lead and Facilitate

- Joint AM coordination and collaboration
- Funding to support joint priority AM projects
- Sponsor the Additive Manufacturing Innovation Institute
- Develop DoD AM Strategy
- Develop DoD AM Policy

## Partner

- Manufacturing Innovation Institutes:
  - America Makes
  - Manufacturing times Digital (MxD)
  - Lightweight Innovations for Tomorrow (LIFT)
  - NextFlex
- Other Partnerships:
  - NDIA Manufacturing Division
  - Additive Manufacturing for Maintenance Operations

## Invest in R&D

- Manufacturing of Gradient Index (GRIN) Polymer Lenses for Military Optics
- Cold Spray Additive Manufacturing (AM) & Structural Repair (SR)
- Enhanced Energetics
- Conformal Antennas





# Strategic Technology Protection & Exploitation Mission and Focused Lines of Effort



Acting Deputy Director  
Strategic Technology Protection & Exploitation (STP&E)  
*Dr. Robert Irie*

D, Maintaining Technology  
Advantage  
*Dr. Robert Irie*



***Maintain Leadership in Critical  
Technology Modernization Areas***

D, Resilient Systems  
*Ms. Melinda Reed*



***Foster Assured Resilient Missions,  
Systems and Components***

D, Technology and  
Manufacturing Industrial Base  
*Mr. Robert Gold*



***Advance Domestic Innovation Base  
to Deliver Modernization Goals***

## ***STP&E MISSION:***

***Promote and protect technology advantage and counter unwanted  
technology transfer to ensure Warfighter dominance through superior,  
assured, and resilient systems, and  
a healthy, viable national security innovation base.***