



Improving Logistics Agility through Additive Manufacturing



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Chief of Staff of the Army General Milley:

“maintain the readiness of our current force while simultaneously looking to emerging technologies for the deeper future 2025 to 2050”

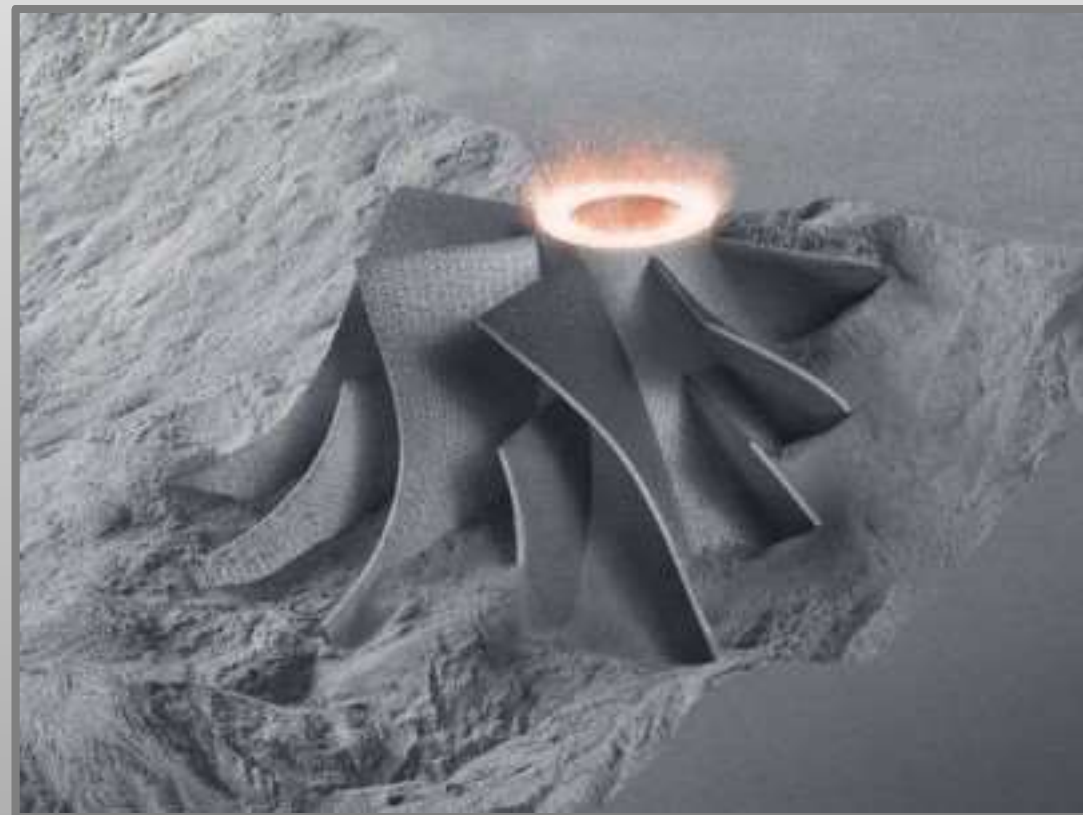




Agenda



- Additive Manufacturing
- DoD Initiatives
- Army Supply System & Policy
- Benefits
- Constraints
- Risks
- Way Ahead





Additive Manufacturing



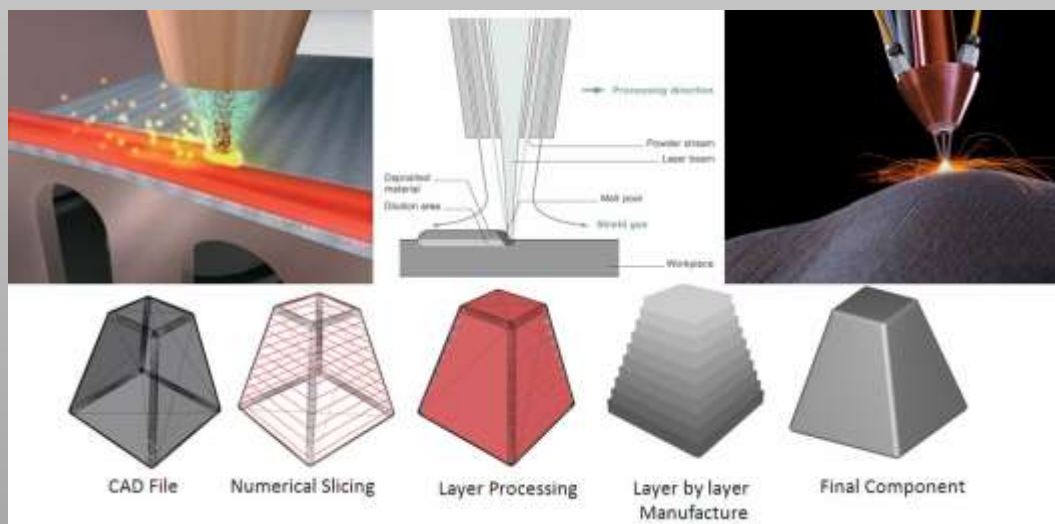
Manufacturing processes that use 3D Computer Aided Design (CAD) model data to join materials to make an object

Deposition & Sintering methods:

- Fused Deposition Modeling (FDM)
- Selective Laser Sintering (SLS)
- Direct Metal Deposition (DMD)

Extrusion method:

- Continuous Liquid Interface Production (CLIP)

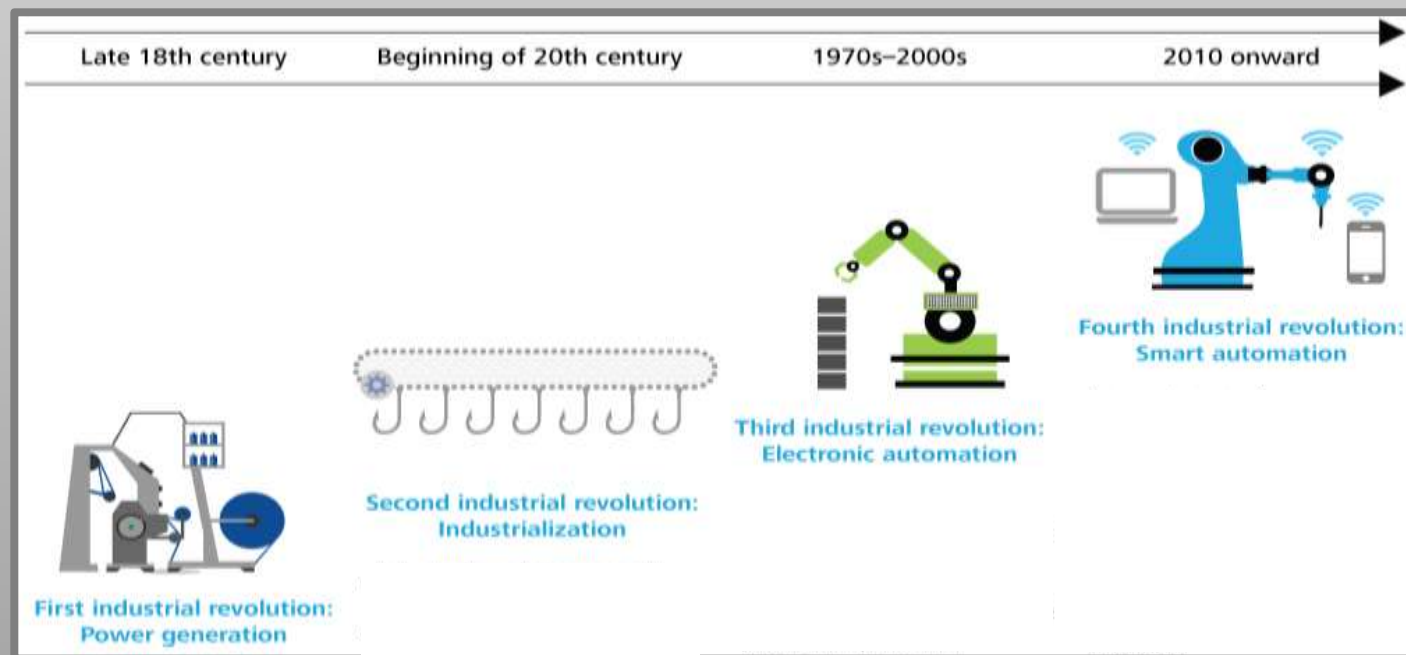




Why Additive Manufacturing?



- 24% of private manufacturing firms are using AM
- Private industry is using AM to produce finished parts
- 4th Industrial Revolution: Smart Automation
- Digital to physical leap
- Connected digital technologies





DoD Initiatives & Reviews



Air Force: Research laboratory; F-18 and F-35



Navy: Rapid Innovation Cell; USS Essex



Army: Rapid Equipping Force; Army Materiel Command (AMC)



Defense Logistics Agency:

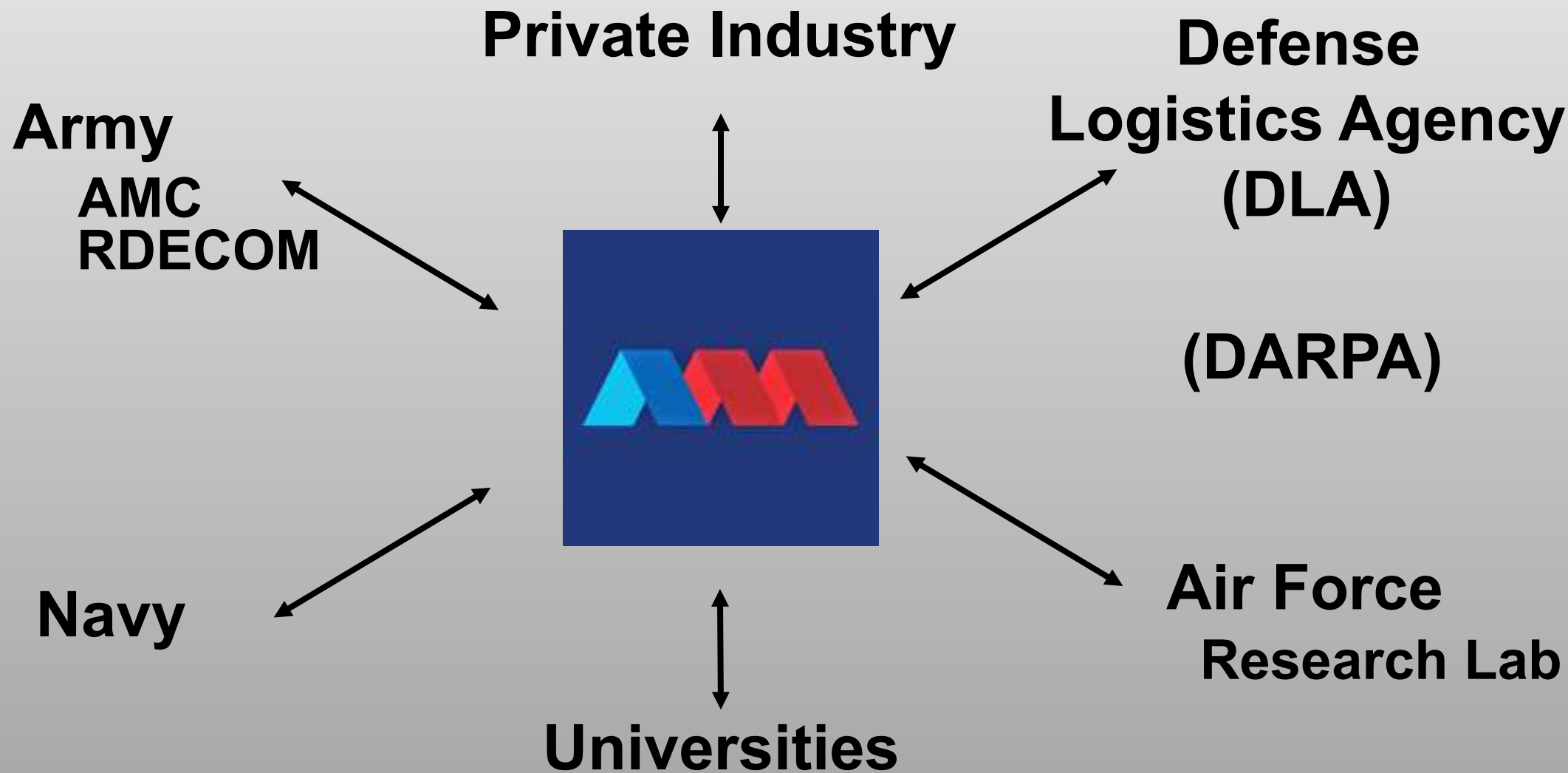
- Candidate part identification
- Tech Data Package (TDP) refinement, storage, and security
- Part certification and quality assurance standards

Government Accountability Office (GAO) Report: Defense Additive Manufacturing (Jul '14 – Oct '15)

U.S. Army Logistics Innovation Agency (USALIA): Additive Manufacturing Cost-Benefit Analysis (Oct '15)



America Makes





Policy



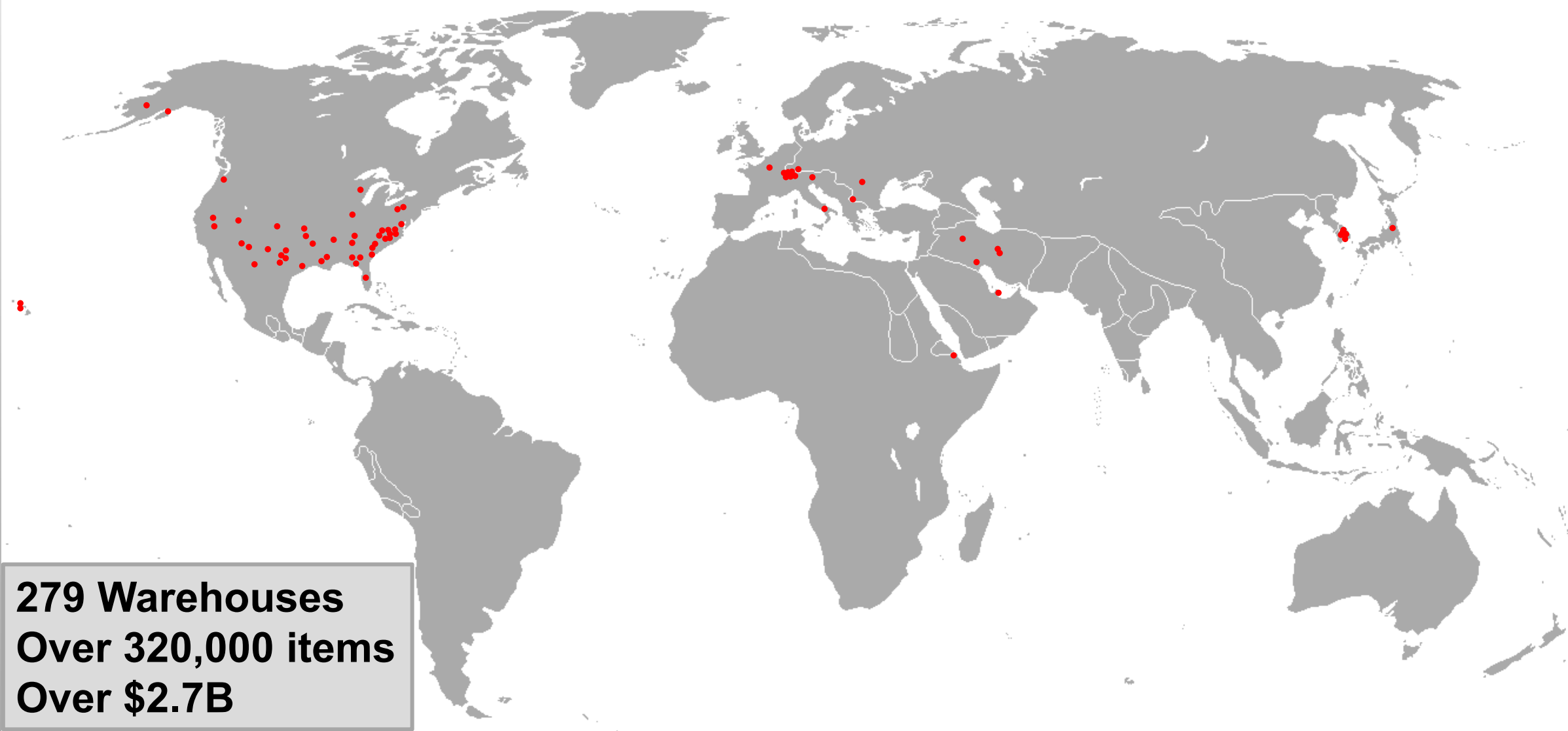
- Maintain echelons of sustainment stocks
- Repair parts at strategic and tactical units

Double Hexagon, Self-Locking Nut





U.S. Army Supply Support Activities



279 Warehouses
Over 320,000 items
Over \$2.7B



Benefits



- Cost savings
- Reduced repair part inventory
- Reduction of pilferage, loss, and damage
- More responsive supply chain
- Greater flexibility
- Avoidance of obsolescence





Constraints

- Too slow and costly
- Part certification standards
- 3D Technical Data Packages (TDPs)
- Raw materials: qualification, availability, consistency, and uniformity





Risks

- Printed part defects
- AM printer failure or loss
- Raw Materials
 - shortage
 - flammability
 - humidity control requirements





Way Ahead



- Replace traditional stockpiles of secondary item repair parts
- Secure raw material intellectual property
- Invest to implement technology at lowest level



- Continue efforts to qualify materials and certify parts