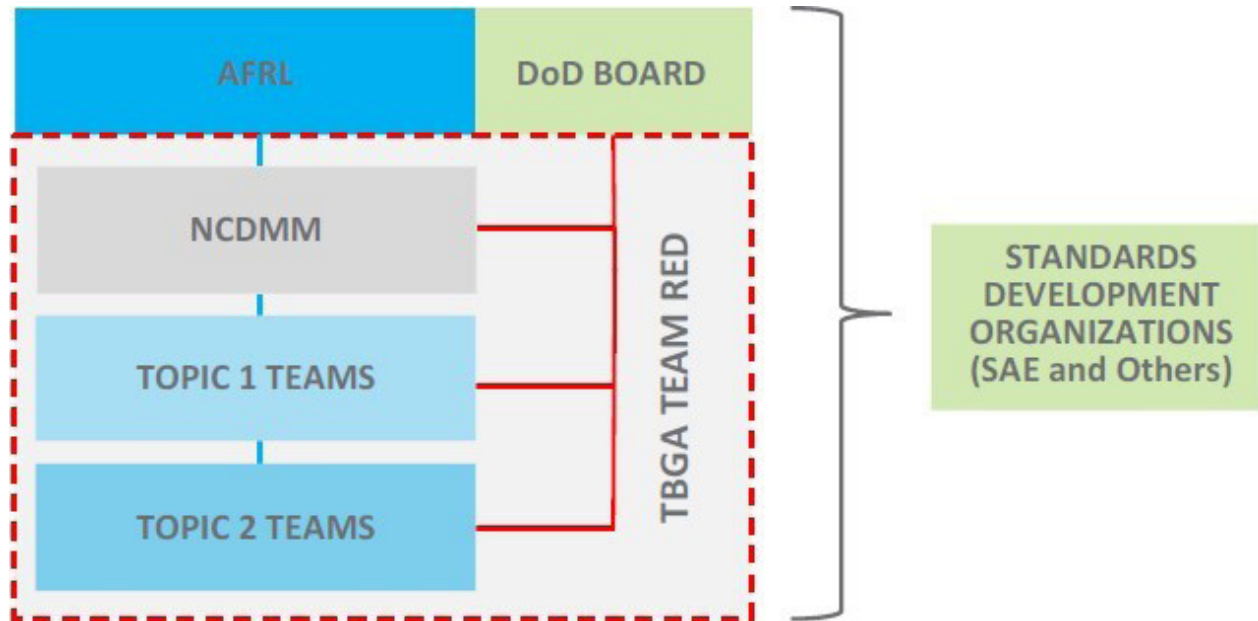


Team Red: Thorough Evaluation of AM with Rigorous Expertise and Data



Team Red Organization and Interactions with the Delta Qual Program

PROBLEM

Additive manufacturing (AM) machines and materials qualification are major barriers to broad AM adoption. Generating the requisite data and models requires significant resources to produce statistically significant data. This qualification process requires generating test coupons under a controlled process and testing and analysis of the resulting data. These processes are then “frozen” with no changes to key process variables allowed. Standard-based guidance does not exist for requirements when a process change is needed. This greatly inhibits the agility of AM processes to respond to changes in the technology or supply base, allowing only one path to implement change to a qualified process — a total requalification, which may cost more than \$3M per machine/material combination and take several years.

OBJECTIVE

This project will demonstrate the ability to rapidly and affordably update and/or establish a qualified AM process that can allow for changes in key AM process, post-processing, and/or material feedstock variables.



**AMERICA MAKES
TECHNOLOGY
DEVELOPMENT
ROADMAP**

This project aligns to:



PROCESS

**ASTM PROCESS
CATEGORY**
Powder Bed Fusion

EQUIPMENT
Laser Powder Bed
Fusion (LPBF)

MATERIAL
Ti-6Al-4V

TECHNICAL APPROACH

Under this project, Team Red, The Barnes Global Advisors (TBGA) will research, map, document, and analyze AM qualification approaches, including relevant material/process specifications, and develop a conservative (nearly start from scratch) baseline for comparison. The team will review and evaluate the demonstration projects, identify both positive and negative lessons learned, and rate them against the key performance parameters (KPPs), and the baseline test matrix and plan. Following the evaluation activities, Team Red will complete its analyses and document its final recommendations. Any recommendations will be communicated to the America Makes Technology Roadmaps team for consideration in future activities.

PROJECT START DATE

September 2023

EXPECTED END DATE

September 2025

EXPECTED DELIVERABLES

- Cite standards and material/process specifications to be leveraged by this program
- Draft language for including process change in standards
- Consolidated and curated list of lessons learned, key recommendations, and draft language for standards organizations to consider
- Final report

FUNDING

\$826,993 total project budget

(\$400,000 public funding/\$426,993 private funding)

PROJECT PARTICIPANTS

Project Principal:

Team Red, The Barnes Global Advisors (TBGA)

Other Project Participants:

BlueForge Alliance
Carnegie-Mellon University
Federal Aviation Administration
NASA
Sandia National Laboratories
SAE International

Public Participants:

U.S. Department of Defense