PROJECT SUMMARY 5550

Common Additive Manufacturing Qualification Template (CAM-QT)

Functional Jet Engine Parts Built Using AM (GE Aerospace)

PROBLEM

Qualification of Additive Manufacturing (AM) machines and materials is a major barrier for the broad adoption of AM. Generating the requisite data and models requires large investments of resources and time from small/medium businesses to produce a body of statistically significant data. This usually requires generating coupons under a controlled process, testing the coupons, and analyzing the resulting data. Moreover, part vendors are required to supply substantially different data to each Original Equipment Manufacturer (OEM), even when using the same manufacturing process. The OEM supplier qualification process, the requirements that are often held as proprietary information, could benefit from common requirements across application sectors such as Engine, Structural, and Mechanical Subsystems.

OBJECTIVE

The objective of this project is to document the qualification requirements of in-service metal AM parts accepted by design authorities of three engine OEMs as part of their individual qualification/certification efforts.

AMERICA MAKES TECHNOLOGY DEVELOPMENT ROADMAP

This project aligns to:

MATERIAL

ASTM PROCESS CATEGORY
NA

EQUIPMENT
NA

MATERIAL
NA

TECHNICAL APPROACH

Advanced Science and Technology Research Organization of America (ASTRO America), the principal investigator (PI) for this project, will:

- Engage with key engine OEMs (GE Aerospace, Honeywell, Pratt & Whitney) to establish a plan and requirements for a common AM qualification template.
- Generate a detailed AM qualification template, based on Systems Engineering methodology, that defines requirements sufficient to meet OEM needs for Operational Qualification (OQ) and Installation Qualification (IQ).
- Work with the engine OEMs to identify a specific material/machine combination to demonstrate the common qualification template with analytic analysis conducted by ASTRO America.
- Review the analytic demonstration results with OEMs, the Government Advisory Team, and NCDMM/America Makes.

PROJECT START DATE

July 2023

EXPECTED END DATE

December 2024

EXPECTED DELIVERABLES

- Common Qualification Template for Operational Qualification (OQ) and Installation Qualification (IQ)
- Final Report

FUNDING

$1,000,000 total project budget

PROJECT PARTICIPANTS

Project Principal:
Advanced Science and Technology Research Organization of America (ASTRO America)

Other Project Participants:
NCDMM/America Makes
GE Aerospace
Honeywell
Pratt & Whitney

Public Participants:
U.S. Department of Defense