

**NCDMM Request for Proposal 22-154
AMNOW Metals Challenge Project Call
Phase 1**

February 7, 2022

National Center for Defense Manufacturing and Machining (NCDMM) is accepting proposals to demonstrate the applicability of artificial intelligence and data analytics to Laser Powder Bed Fusion (LPBF). The purpose of this project is to leverage analytics to correlate material and process input data to material property data.

As Metal Additive Manufacturing is advancing from primarily a prototyping process to being used in serial production, the process and material data generated are critical to parts qualification. NCDMM through their AMNOW program seeks to leverage artificial intelligence and data analytics to a significant data set of Additive Manufacturing (AM) digital thread data to discover trends and insights into the repeatability and predictability of the Laser Powder Bed Fusion (LPBF) process. These data sets encompass over thirty-six (36) 316L powder AM builds of parts and eight hundred (800) coupons, collected across three (3) machine models, six (6) machines, three (3) facilities, and two (2) heat treatments and other post processes.

NCDMM is utilizing a two-phase approach to this analytical effort.

- Phase 1: Access over 36 AM builds in 316L and associated post-processing data to create digital thread insights, visualize data, apply artificial intelligence algorithms, predict properties, find anomalies, or changes. Successful proposers may receive up to \$45,000 of America Makes cost share. The total amount of cost share received is at the sole discretion of America Makes.
- Phase 2: Based on findings, work with parts producers to optimize their last 2 builds. Successful proposers may receive an award value of \$50,000, or the same in America Makes cost share, which cannot be applied to a membership fee.

Up to five (5) project agreements will be available in Phase 1. Upon completion of Phase 1 effort, as many as three (3) of those awardees will be selected to proceed to phase 2. An evaluation panel of AM and metals experts will review the proposals, hear the presentations, and make selection recommendations to NCDMM. Note: Phase 2 does not require a formal proposal submission; the Phase 1 final report briefing will serve the same purpose.

Important Dates:

February 11, 2022	Questions related to project scope or approach are due to AMNOW@NCDMM.ORG
February 15, 2022	All questions and responses will be published on AMERICAMAKES.US
February 21, 2022	Full proposal submission due (NO concept papers)
February 25, 2022	Oral team presentations to Evaluation Team
February 28, 2022	Phase 1 Awardees notified
March 2, 2022	Project Agreement issued and NDAs executed

Under this Challenge, the Project Agreement Holder (PAH) is to:

- Download data files from the AMNOW Metals Challenge SharePoint, interview AM Builders, then, using analytics, link and correlate data associated with build and post processing data files.
- Compare and contrast data to identify trends, anomalies and/or insights. Develop an algorithm(s) to predict build outcome and provide recommendations for improvement.
- Produce report of findings.

Project Definition and Scope

The project description and scope are contained within the applicable AMNOW Statement of Work (ASOW) and associated documents. Released technical specifications (AMS, ASTM) will NOT be provided by NCDMM; however, **draft** technical specifications and AMNOW documents will be included in SharePoint download access after award.

Proposal Format

Technical – Contained in 15-minute Presentation for the Evaluation Board

- Addressing ASOW-154
- Draft Execution Plan and Schedule
- Overview of approach and proposed software or tools, including description of off-the-shelf or proprietary tools.
- What They Plan to Demonstrate
- What Benefit They Could Provide for Final 2 Builds

Programmatic

- Participating Organizations and DD2345 Registration (attach copy)
- Identification of Single Person from Team to Access SharePoint and Download Data
- Willingness to sign NDA and certify deletion of data at the end of program
- Willingness to present results at an America Makes or NCDMM Sponsored event in 2022
- Non-competitor or common ownership, ATI Specialty Metals, Penn United Technologies, Innovative 3D Manufacturing

Cost – Not Required

Proposed Delivery Schedule

Line Item	ASOW 154 Reference	Title of Deliverable	Data Rights	Delivery Schedule
0001	5.1.2	Kickoff Meeting	Limited	March 9, 2022
0002	5.7.1	Submit summary report	Unlimited	April 25, 2022
0003	5.7.2	Presentation of Findings to Evaluation Board	Unlimited	April 29, 2022
0004	5.7.3	Presentation of Findings at America Makes Event	Unlimited	TBD

Proposal Evaluation Criteria

- Tools and Software to Use
 - Uniqueness – 15%
 - Description Details – 15%
- Data They Plan to Use (More is Better) – 10%
- What They Plan to Demonstrate – 30%
 - Correlation of Input Parameters and Material Properties
 - Identification of Process Anomalies
- Benefit They Could Provide for Final 2 Builds (e.g. Optimization, Transfer to New Machine, etc.) – 30%

Proposal Submission Deadlines

All proposals in response to this RFP are due no later than NOON EST, February 21, 2022. NO EXTENSIONS IN PROPOSAL DUE DATE WILL BE APPROVED.

Proposals received after the required due date and time will not be evaluated or considered for award.

Each bidder must submit their proposal to AMNOW@ncdmm.org.

We look forward to working with you to accomplish our goal of supporting the Warfighter.



George B. Barnych
Vice President and CTO