



APPROVAL SPRINTS

There is a pressing need to rapidly deploy engineering solutions for the sustainment of Air Force fleet and infrastructure. Advanced manufacturing technologies are capable of rapid production for sustainment; however, it is difficult to exploit these capabilities without radical improvement to Air Force certification methods and timelines in the approval of new materials, processes, and components. Selected Approval Sprint teams will compete to deliver a polymer additively manufactured replacement solution for rapid deployment of a specified F-16 aircraft component. Deliverables will include sample components, a technical data package, and an innovative plan to accelerate the Air Force qualification timeline for the proposed solution. While overall judging will be heavily focused on implementation approach; the top component design which meets minimum specified requirements will be eligible for installation and a one-time flight on an F-16 during the AM Olympics virtual event.

CHALLENGE GOAL

The goal of this technical challenge is to identify innovative strategies for rapid design, qualification and deployment of sustainment solutions which leverage new manufacturing materials, processes, and components. Selected Approval Sprint teams will compete to deliver a polymer additively manufactured replacement solution for rapid deployment of a specified aircraft component.

QUALIFICATIONS FOR CONTESTANT TEAMS

No more than 8 teams will be chosen for participation in this event. Teams must meet the following qualifications:

- Collaborative teams with industry, government, and academic partnerships are encouraged.
- Teams must register online and submit a one-page description, resumes, and an optional short video highlighting qualifications and capabilities that will drive success in this challenge event.
- Participants must be United States citizens approved to work on defense related activities in accordance with International Traffic in Arms Regulations (ITAR).
- Teams must have the capability, software, and equipment to design & model a component geometry and prepare a solid model and engineering drawing.
- Teams must have access to a polymer 3D printing technology and material with reasonable potential of producing a component to the following requirements. Teams will be required to share requested information about machines, materials, etc.
 - Build volume: 4 x 6 x 6 inch minimum
 - Chemical compatibility: immersion in jet fuel, hydraulic fluid, engine oil, and water
 - Service temperature: -65 to +200°F
- Selected teams must be available to compete remotely during the challenge time-frame and also attend the AM Olympics Virtual Event.

RULES FOR EVENT

Entries chosen for the competition will be invited to participate remotely throughout the Approval Sprint challenge event. Teams will be selected based on the outlined submission requirements. During the event, teams will compete remotely using their own software and equipment to develop a specific F-16 polymer component for additive manufacture. Participation requires approval to work on ITAR related components and data; accordingly, only US citizens approved to work on defense-related activities may participate.

**RULES FOR
EVENT
(CONTINUED)**

The event will kick-off with a virtual meeting, at which time, specific component requirements and challenge deliverables will be provided. Teams will be required to deliver final printed components, a technical data package, and an accelerated qualification strategy for full approval of proposed materials, machines, and complete family of components. Teams will have the opportunity to present their final design and qualification process to the judging panel. Qualification strategy will be judged relative to standard Air Force processes with more information available to teams at kick-off. Printed components will be independently evaluated relative to minimum requirements for one time flight.

**EQUIPMENT &
MATERIALS**

- Teams will be responsible for all equipment and software identified under qualifications.
- Teams may also be requested to provide optional video footage of CAD design, simulation, manufacturing equipment, print processing, and other activities to support virtual delivery of challenge content.

**CHALLENGE
AGENDA**

| | |
|-------------|---|
| 06.22 | Application process opens |
| 07.24 | Application process closed |
| 08.12 | Teams selected and notified |
| 08.31 | Approval Sprints challenge virtual kick-off* |
| 08.31-09.25 | Teams work through challenge requirements |
| 09.25 | All materials submitted, challenge closed |
| 09.28-10.16 | Component evaluation and judging |
| 10.19-10.23 | Winner will be announced during Advanced Manufacturing Olympics |

* Denote required attendance by all registered participants and judges.

**JUDGING
PROCEDURE**

The judging panel will include Subject Matter Experts (SMEs) from areas such as: F-16 Systems Program Office (SPO) engineering, Air Worthiness Board (AWB), Change Evaluation Team (CET), Configuration Control Board (CCB), and AM technical experts. Judging criteria are outlined in rubric below.

| Criteria | Explanation | Weight |
|------------------------|--|--------|
| Design Approach | Application of unique design tools and features to leverage the benefits of additive manufacturing materials and processes to deliver improved performance. Performance criteria examples include: part weight, strength, dimensional tolerance, and print time. | 20% |
| Tech Data Quality | Delivery of a robust technical data package to support both the Air Force qualification process and ultimate reproduction of the proposed component. Tech data examples include information such as CAD models, engineering drawings, analyses, test data, and manufacturing plan. | 20% |
| Qualification Strategy | Identification of novel approaches and advanced tools to positively impact time, cost, & risk reduction in the qualification of new materials, processes, and components within the Air Force's existing qualification process. | 50% |
| Judges' Discretion | | 10% |
| Total: | | 100% |

AWARDS

- First place \$100,000
- Second place \$50,000
- Third place \$40,000
- All teams will be recognized by the Air Force