

STATEMENT OF WORK

1. Objective/Requirements

The main goal of the proposed research is to support detailed analysis of wind tunnel force, moment, and pressure measurements for the Common Research Model (CRM). The CRM is a standardized, public-domain aircraft geometry for benchmarking wind tunnel experiments and validating computational fluid dynamics (CFD) methods.

2. Characteristics, Scope, and Specs

The contractor shall perform the following duties:

- Wind-Tunnel Corrections Using TWICS
 - Implement TWICS (Transonic Wall Interference Correction System) on CRM wind-tunnel data acquired at NTF.
 - Evaluate blockage, incidence, and wall-interference corrections using:
 - Model geometry and mount configuration
 - Wall boundary-condition representations (solid/slotted walls)
 - Spanwise lift distributions
 - Empty-test-section wall-pressure signatures
 - Quantify sensitivity of corrected forces/moments to model size, tunnel environment, and Reynolds-number scaling.
 - Produce corrected aerodynamic coefficients suitable for comparison with DPW/HLPW datasets.
- Attachment-Line Flow Transition and Relaminarization Study
 - Use CRM surface-pressure distributions to compute attachment-line Reynolds number R_2
 - Determine laminar, transitional, or turbulent state using criteria from Gaster, Pfenninger, and Poll.
 - Investigate presence and likelihood of relaminarization under favorable pressure gradients at high-lift conditions.
 - Compare observed CRM-HL behaviors (e.g., lift trends vs Reynolds number) to historical evidence of relaminarization in wind-tunnel and flight tests.

3. Place of Performance

University of California, Davis, CA

4. Period of Performance

This work shall be performed September 1, 2026 through August 31, 2027.