

Space Technology Mission Directorate Game Changing Development Program

ACO: Liquid Oxygen/Methane Lander Propulsion (LOX-CH₄ Prop) Task

Goals

NASA assist in design of lunar lander propulsion system design, RCS engine requirements, and RCS engine design, fabrication, and testing.

Technical Approach

Design/Analysis Cycles (DACs) were performed to refine vehicle propulsion system architecture design. The first traded payload capacity with propellant combination, while the remaining DACs focused on pressurization system and RCS requirements/usage. Development thrusters, with discrete design variants targeting different operating conditions, were fabricated and characterized through testing and high-fidelity modeling.

Results

Five distinct thrusters were designed, fabricated, and tested. Testing informed design modifications to manifold geometry and cooling scheme that improved ignition and engine performance.

