

SPACE PROPULSION SYMPOSIUM (C4)
Propulsion System (1) (1)

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CONTINUED DEVELOPMENT OF THE AEROJET ROCKETDYNE AR1 STAGED COMBUSTION
BOOSTER ROCKET ENGINE**Abstract**

Aerojet Rocketdyne is currently in development of the AR1 liquid rocket engine. AR1 is a 500,000 lbf-class, oxygen-rich, kerosene-fueled, staged combustion rocket engine. AR1 will power U.S. Evolved Expendable Launch Vehicles (EELV) and eliminate dependence on foreign supplied booster propulsion systems for critical National Security Space launches. AR1 is being developed in a partnership with the United States Air Force under an Other Transaction Authority agreement. AR1's core design features make it an attractive solution for numerous launch vehicle booster and 1st stage applications. The AR1 design leverages Aerojet Rocketdyne's extensive experience in the design and production of large liquid rocket engines to ensure a low risk solution. It also leverages advanced manufacturing technologies being pioneered by Aerojet Rocketdyne including Additive Manufacturing and advanced alloys for oxygen-rich environments. The AR1 development program has completed significant milestones to date including completion of the Engine System Critical Design, full-scale testing of Staged Combustion elements, battleship preburner, turbopump and valve flow testing, and numerous Manufacturing Technology Demonstrations for critical engine components. Development of AR1 is on track for Qualification in 2019 and first flight in 2020.