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NASA, United States

ASSESSMENT OF MON-25/MMH PROPELLANT SYSTEM FOR DEEP-SPACE ENGINES

Abstract

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Huu P. Trinh Christopher Burnside Williams Hunter
NASA Marshall Space Flight Center Huntsville, AL 25812

In the past decade, NASA has formulated science mission concepts with an anticipation of landing spacecraft on the lunar surface, meteoroids, and other planets. Advancing thruster technology for spacecraft propulsion systems has been considered for maximizing science payload. Starting in 2010, propulsion system designs and engine tests programs have been carried out. Propellant system of oxidizer MON-25 and fuel MMH has been considered in trade studies for such flight missions. Oxidizer MON-25 is a mixture of 75As part of MON-25/MMH engine technology maturation, several engine development test programs have been conducted. It started with engines based heritage Missile Defense Agency (MDA) technology aimed for a lightweight and efficient system in terms volume and packaging. The thrust classes of 5-lbf and 100 lbf were tested with the capability of a pulse mode operation for a wide range of mission duty cycle. Additional engine development tests were followed. During the course of the development efforts, propulsion system trades were performed in parallel. It concludes that there is a balance of potential engine design issues and mission benefits, although the propellants can handle low temperature. This paper will report an assessment of using the MON-25/MMH system for deep-space application. Discussion of pros and cons will be also presented.