NASA SBIR/STTR Technologies

X2.02-9554 - Non-Toxic HAN Monopropellant Propulsion

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Identification and Significance of Innovation

- Most In Space chemical propulsion systems use hydrazine propellant. Hydrazine is highly toxic & dangerously unstable.
- Non-toxic HydroxylAmmonium Nitrate (HAN) AF-M315E monopropellant has 12% higher Isp and 60% higher density-Isp than hydrazine monopropellant.
- HAN?s combustion temperature is significantly higher at 2083?K.
- The Phase I Ir/Re chamber demonstrated pulse and 10 sec firings.
- New foam catalyst developed to ignite HAN AF-M315E.

Estimated TRL at beginning and end of contract: (Begin: 4 End: 6)

Technical Objectives and Work Plan

- Develop a non-toxic HAN based monopropellant thruster to replace hydrazine.
- Pursue improvements to Phase I foam catalyst and injector.
- Demonstrate ignition of non-toxic AF-M315E with Phase II design.
- Test life and response time of the thrust chamber assembly.
- Analyze post test thruster and catalyst.
- Make multiple thrust chambers for commercial partners: Aerojet, Dynetics, AMPAC-ISP, Pratt & Whitney Rocketdyne
- Commercialize "green" thruster

NASA Applications

- Mono-propellant and Bi-propellant rocket engines
- Reaction Control Systems
- Apogee Engines
- Mars Ascent Vehicle, Lunar lander

Non-NASA Applications

- Mono-propellant and Bi-propellant rocket engines for commercial and military satellites
- Reaction Control Systems for commercial and military satellites
- Apogee Engines for commercial and military satellites
- Jet engine restarters and auxiliary power units
- Divert and Attitude Control Systems for missile interceptors

Firm Contacts

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NON-PROPRIETARY DATA