ELECTRON ENERGY CORPORATION

Specialists in Rare Earth Magnets and Magnet Systems

Research Title: Novel High Temperature Magnetic Bearings for Space Vehicle Systems

NEED & CUSTOMER REQUIREMENT

Need: Roller bearings & squeeze dampeners 260 °C max.
High temp dampening not possible with oil & elastomers.
Limited speed, constant elect power req'd for force & control

Operational Gap: lower weight, higher efficiency
No lubrication, no cooling, operation at 523 °C (1000 °F)

Customer Specifications: Weight 48 lbs, 20,000 rpm, Load of 500 lb_f axial, 750 lb_f radial, stiffness Ki 41 lbf/in, Kp -37000 lb/in

Technology Description: Ultra High temp permanent magnets provide most force with electromagnets for control only, homopolar low ohmic loss design, fault tolerant catcher bearing back up, high stiffness, high temperature dampening

SPONSORSHIP

Agency: NASA Glenn Research Center

Partners: Texas A&M Univ. Vibration Control & Electromechanics Lab Dr. Alan Palazollo

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TECHNOLOGY DEVELOPMENT MILESTONES (SBIR)

Milestones	TRL	Measure of Success	TRL Date
build partial prototype	3	prototype radial only bearing built Bearing design, FEA	8/1/2005
build test stand	3	test stand and controls designed, built, test matrix developed	10/1/2005
test stand w instruments	4	controls design & fabrication complete	8/1/2007
fabricate complete	4	bearing w radial and axial built & tested in lab	12/1/2007

Open Contracts: NASA SBIR Phase II NNC06A04C $599K

TECHNOLOGY TRANSITION OPPORTUNITIES

The company is looking for transition opportunities and program dollars for the following applications and targeted activities:

TRL	Required Test and Demos	Target Date	$ Needed
5	Test on full bearing system in aircraft/ commercial/ space environment	12/1/2008	$300,000

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