UNIVERSITY TRANSPORTATION CENTER FOR RAILWAY SAFETY

Exhibit F - UTCRS

UTC Project Information	
Project Title	Demonstration of Magnetostrictive Materials for Self-Powered Monitoring of Rail Vehicle Suspension Components
University	The University of Texas Rio Grande Valley (UTRGV)
Principal Investigator	Heinrich Foltz, Ph.D., P.E., Electrical Engineering (PI) Constantine Tarawneh, Ph.D., Mechanical Engineering (Co-PI) Jazmin Ley, M.S., Mechanical Engineering (Co-PI)
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Funding Source(s) and Amounts Provided (by each agency or organization)	Federal Funds (US DOT UTC Program): $63,417 Cost Share Funds (UTPA): $33,423
Total Project Cost	$96,840
Agency ID or Contract Number	DTRT13-G-UTC59
Start and End Dates	January 2015 – May 2017
Brief Description of Research Project	The purpose of the proposed project is to demonstrate the use of magneto-strictive materials for self-powered sensors in railroad suspension components. Results obtained in a previously funded University Transportation Center for Railway Safety (UTCRS) project have shown that Terfenol-D has the capability to harvest significant amounts of energy (on the order of 100 mW/cm3) under conditions typical of those found in railcar bearing adapters, and is also capable of acting as a real time load sensor. Both applications use the same mounting fixture and static magnetic field bias, indicating that a single Terfenol-D core could simultaneously provide load sensing as well as sufficient power generation to supply its own support

	electronics, multiple additional sensors, and a low-power RF transceiver for wireless monitoring. The primary deliverable for this project will be an integrated, self-powered prototype comprising (a) a magnetostrictive core biased and packaged appropriately for mounting in or on a railroad bearing adapter, (b) support electronics simultaneously extracting power and providing calibrated load measurement, and (c) a basic wireless transceiver. The prototype will be tested in the UTCRS laboratory on a railroad bearing tester that closely simulates field service operating conditions.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Pending Project Competition.
Impacts/Benefits of Implementation (actual, not anticipated)	Pending Project Competition.
Web Links • Report • Project Website	http://www.utrgv.edu/railwaysafety/research/mechanical/2015/energy-harvesting-applications/index.htm