



Photo courtesy of CIMS

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CIMS works with Marines to develop smarter vehicles

By ANDREA DECKERT

Researchers at Rochester Institute of Technology's Center for Integrated Manufacturing Studies are making vehicles used by the U.S. Marine Corp. smarter as part of a multimillion-dollar smart-sensor initiative aimed at extending the life of military vehicles.

The project is being funded by a portion of a \$2.7 million allocation to CIMS from the federal Office of Naval Research for 2006-07.

The center started working on the smart-sensor project in 2004 and installed the equipment on a light armored vehicle at Camp Pendleton in California.

This week, researchers are headed back to the California base to install the next generation of the product, which features advanced capabilities, such as hardware and software upgrades, for a broader range of vehicles.

The sensors will be attached to Humvees and medium tactical vehicle replacements—known as 7-ton trucks or MTRVs, since they are replacing an older 5-ton truck model—as well as the light armored vehicles.

In use by U.S. troops in Iraq, the light armored vehicle was developed in the late 1970s and was put into service in 1983. It was expected to go out of service some five years ago, but budgets have forced the U.S. military to continue using them, despite their age.

On the battlefield, the smart sensors will have the ability to monitor vehicle location and to detect potential failures in operating components—such as amount of fuel and weapons' condition—before they happen, making resupply, maintenance and repair efforts more effective, said Michael Thurston, senior staff engineer at CIMS.

The technology will allow military personnel access to vehicle performance information from a remote location using wireless transmission. Access to such information can help personnel determine whether a vehicle is likely to complete a

mission under its current status or if it needs repair, said Edward McCarthy, senior program manager at CIMS.

"It's helpful to know if a vehicle has four hours of operations left before it has a malfunction," McCarthy said. "These sensors do that."

The aim is to get the most life possible from the vehicles through an overview of the vehicle's health, McCarthy said. CIMS staff, including Thurston and himself, will be working with the Navy while in California, training personnel on how to use the equipment.

The equipment already has delivered, he said. Earlier this year, the vehicle equipped with the first sensors was sunk during a training operation, but officials were able to collect data from the sensors to determine how, and when, the equipment malfunctioned.

The Marine Corps is expected to implement the technology over the next several years.

Many of those working on the program—including CIMS staff and RIT students—have military experience, including McCarthy, a retired U.S. Marine Corps major, who served for 20 years as an armor officer and electrical engineer. He later taught electrical engineering at the U.S. Naval Academy, his alma mater.

The work on smart sensors earned CIMS a 2004 National Center for Advanced Technologies Defense Manufacturing Excellence Award.

The sensor technology also is being tested by the Rochester-Genesee Regional Transportation Authority. The data obtained could be useful in tracking trends such as fuel usage and lead to ways to change operations to save fuel, McCarthy said.

Part of the federal funding from the Office of Naval Research is going toward remanufacturing as a way for the military to save money and re-use parts that may not be available today. CIMS works on the process with area manufacturers, who then often bid on the work.

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