Marines test new energy-efficient weapon in the war on trash

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The Micro Auto Gasification System (MAGS) is a solid waste disposal system that enables individual units to efficiently manage their own solid waste stream in an environmentally friendly manner. This system was developed under the Office of Naval Research's Environmental Quality Discovery and Invention program. Credit: US Navy photo by Dee Finning

In partnership with the Office of Naval Research (ONR), Marines at Camp Smith, Hawaii, are testing a high-tech trash disposal system that can reduce a standard 50-gallon bag of waste to a half-pint jar of harmless ash.

Called the Micro Auto Gasification System (MAGS), the unit is currently undergoing evaluation by U.S. Marine Corps Forces, Pacific (MARFORPAC) as a possible solution to help Marines win their daily battle against the increasing trash at remote forward operating bases (FOB).

Lt. Col. Mike Jernigan, a Marine combat engineer who recently commanded a logistics battalion in Afghanistan, said waste disposal in the field is a problem.

"Right now, there are really only two solutions: burn it or bury it," Jernigan said. "Any potential solution must reduce the security and logistics concerns of trash disposal, and help the environment … that's a good thing for the Marine Corps."

MAGS is both environmentally friendly and fuel efficient. A controlled decomposition process, which thermally converts energy from biomass is the key to MAGS' effectiveness. "The system essentially bakes the trash and recovers a high portion of combustible gas byproduct, which is used to fuel the process," said Donn Murakami, the MARFORPAC science adviser who leads the Marine Corps' evaluation team.

Developed under the Environmental Quality, Discovery and Invention program at ONR and in collaboration with the Canadian Department of Defence, MAGS was designed to meet the need for a compact, solid-waste disposal system for both ships and shore facilities.

"Decades ago, the idea of harvesting energy from trash was just a side show in the environmental movement," said Steve McElvany, the MAGS program officer at ONR. "Now, the technology is mature enough to where the Department of the Navy is seriously evaluating its practical and tactical benefits."

The energy-efficient and clean-burning properties of MAGS make it attractive to expeditionary units. It has a low carbon footprint, and emissions are not visible, which is a tactical plus. Waste heat can also be used for practical purposes, such as heating living quarters or water.

"What we are doing for FOBs can be applied to schools, hospitals or an

office building," Murakami said. "We are talking about disposing our waste in a different manner, rather than just sending it to the landfill."

Testing of MAGS will continue through March. Next summer, phase three of the evaluation will address the system's expeditionary aspect at the Pohakuloa Training Area, Hawaii.

Provided by Office of Naval Research