

NAVSEA Warfare Centers Complete Energy Analysis for Marine Corps

Analysis of Alternatives Provide Options to Reduce Power Consumption in the Field

THE NAVAL SURFACE Warfare Centers completed an Analysis of Alternatives (AoA) report on the Mobile Electric Hybrid Power Source (MEHPS) for the Marine Corps Systems Command (MCSC) which provides an analysis of the options available that could reduce U.S. Marine Corps power consumption in the field, ultimately saving lives by reducing the need for fuel delivery convoys.

“The MCSC is moving forward with the MEHPS program, collaborating with the Army,” said Jen Gibson, senior program analyst on the Advance Power Team for the Marine Corps Systems Command. “The analysis provided in the AoA was used to draft a Capabilities Development Document that will be staffed through both services. The end product will provide the operating forces with more efficient power generation and storage.”

The analysis was performed to specifically address gaps, such as the present lack of existing capabilities that automatically match loads to expeditionary energy demands, as well as provide options for harvesting energy from renewable or waste sources to power command and control and life support systems.

The analysis evaluated the current state of hybrid power technology in the commercial sector, defining requirements unique to the Marine Corps, defining, analyzing and comparing a diverse set of alternatives, and providing cost and risk assessments of those technologies.

The evaluation included potential commercial or government off-the-shelf solutions, as well as those

still in development, including generators, renewable energy sources, energy storage modules, converters and power electronics.

A team of experts from Naval Surface Warfare Center (NSWC) Panama City, NSWC Crane, NSWC Carderock, MCSC and the Expeditionary Energy Office conducted the analysis.

“This AoA assists the Marine Corps in developing a detailed and cost-effective way ahead for integrating existing programs with new solutions in support of the overarching Marine Air Ground Task Force (MAGTF) concept of employment,” said NSWC Panama City AoA project lead Steve Gorin.



NSWC PCD is home to the Expeditionary Energy and Integration Team's (E3I) test compound where shelters are tested to understand how tents used in theater absorb and retain heat. The E3I's team then researches, develops, tests and evaluates possible energy alternatives for service members.

Jacqui Barker

Expeditionary Energy Team Earns USMC Excellence in Engineering MAGTF Award

THREE NAVSEA WARFARE Centers earned U.S. Marine Corps (USMC) collaborative engineering accolades. The team was among 20 other Department of Defense (DoD) personnel recognized by MCSC. NSWC PCD's team collaborated with MSCS, Program Executive Officer Land Systems, Naval Surface Warfare Centers Carderock, Crane, and Panama City Divisions, and Marine Corps Headquarters on energy reducing initiatives.

The team specifically was recognized for having identified innovative, tactical level, renewable energy systems that not only meet the Marine Corps' specified requirements, but their efforts took the requirements one step farther—to the field.

"The great thing about this award is that it was achieved through the collective efforts of a Navy-Marine Corps team," said Brig. Gen. Frank Kelley, MCSC commanding officer. "They took the commandant's words to heart and went to work finding ways to reduce our energy dependence in Afghanistan and across our operating forces. Their efforts have already resulted in improved energy efficiency and set us on a path to meet both the commandant and secretary of the Navy's expeditionary energy goals."

In fact, the team's efforts resulted in eight percent more operational reach through energy savings than it did in 2011 which may not seem like a lot now, but over time and with more research and development more savings may be realized. The efforts has now led other services to rapidly combine effective solar panels, rechargeable batteries and power management controllers into effective hybrid renewable systems, fielded at the tactical level. Reducing the overall energy consumption at the small unit level by 22 percent, these systems reduced the battery weight of a three day patrol by 35 percent, and size/weight/fuel consumption of the Platoon/Company's Forward Operating Base generators.

The award nomination cited the team having "supported innovative tactical level renewable energy systems, energy efficient generators, and low power lighting systems, optimized power distribution systems, tactical level insulated shelters, and energy optimized command posts."

While expeditionary energy is still somewhat uncharted territory within the DoD, the pioneering joint team started first with recent DoD, Department of the Navy, and USMC energy orders, policies, guidance and more than 90 active programs, 17 Future Naval Capabilities

and science and technology efforts and more than 30 relevant technologies in order to quantify the goals, returns on investments, energy aspect design concepts, and expected test and evaluation energy criterion—a monumental amount of content analysis to propose the path ahead.



Matt McBride, former Combat Support Systems, Assistant Program Manager and E31 team member, accepted the MCSC 2012 Commander's Excellence in MAGTF Engineering Award during an award ceremony held at Quantico, VA.

In addition to analyzing system capabilities, the warfare center team, in conjunction with MCSC Cost and Analysis Branch, evaluated potential system costs. This review eliminated systems that were not the most affordable systems relative to their effectiveness.

"In the end, the AoA identified the potential for hybrid or micro-grid technologies to close gaps that current systems cannot close," said Gorin. "The best alternatives were able to save significant amounts of fuel and extend the life of generators with little additional burden."

The Naval Surface Warfare Centers are field activities of the Naval Sea Systems Command (NAVSEA), and are Navy's principal research, development, test and evaluation activities for surface ship and subsystems. ⚓

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