

Portable Power Energizes Possibilities

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FORT DIX, N.J. - An Air Mobility Battlelab initiative could "energize" new possibilities for aeromedical evacuations in the future.

Termed the Portable Electronic Power Supply for Aeromedical Evacuations, or PEPSAE, initiative, it addresses a problem of heavy and cumbersome avionic frequency converters used to power medical equipment on aeromedical evacuation missions.

"Besides being heavy -- almost 80 pounds -- the avionic converters pose possible electrical sparking and tripping hazards from the electrical cable assembly systems," said Master Sgt. Eric Allain, the project officer for the PEPSAE initiative. "With our initiative, our proposed solution was to provide a small, portable, reliable, lightweight, zero-emission and spark resistant AC/DC power supply to each patient's medical equipment without the use of the aircraft power systems."

To meet the needs of the initiative, the Air Mobility Battlelab, located in the Air Force Expeditionary Center here, teamed up with Jadoo Power Systems to design and fabricate a fuel cell and battery power system.

"This power system consists of two key subsystems -- the power production subsystem and the fuel storage subsystem," Sergeant Allain said.

Each subsystem has proven capabilities, Sergeant Allain said. With the power production subsystem, there is a battery backup system that operates up to 60 minutes and the subsystem itself can power 310 watts of DC power and 255 watts of AC power. The fuel storage subsystem operates with four metal hydride hydrogen fuel storage canisters which can be refilled by a compressed hydrogen tank. Additionally, one fuel canister alone can operate equipment for a critical care air transport team, or CCATT, for more than 12 hours. Combined, run time is more than 48 hours.

To learn more about the effectiveness of the power system, the Air Mobility Battlelab staff held a five-day concept demonstration at Scott Air Force Base, Ill., with members of the 375th Aeromedical Evacuation Squadron. Through the demonstration, they worked to meet four objectives to include using the power system to support medical equipment during standard missions for both aeromedical evacuations and CCATT, to support pre-flight check requirements for aeromedical evacuation equipment, and assess the suitability of the system's technical instructions and training.

"Overall, the PEPSAE demonstrated it was capable of powering up to four litters of CCATT medical equipment for more than 12 hours - a great result," Sergeant Allain said. "The system is lighter and provides significant advantages to the current system in use. Feedback from questionnaires filled out helped us to look at possible improvements for the system. The contractor, Jadoo, has responded with plans for a next generation PEPSAE."

Lt. Col. Jeffrey Lathrop, the Air Mobility Battlelab commander, recommended the initiative be adopted by AMC.

"PEPSAE promises to provide a continuous power capability of any duration to CCATT medical equipment from field hospital to aircraft to main base hospital giving critical care patients overall superior care," Colonel Lathrop said.

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