



Solutions for Expeditionary Power

Colonel Wil Riggins, Project Manager Soldier Warrior, discusses the way ahead for power for the dismounted soldier

While the past ten years has seen an incredible amount of capability being provided to the dismounted infantryman, there has not been a parallel increase in the ability to provide power for that capability within an expeditionary environment, a concept called austere power. That is beginning to change.

Colonel Wil Riggins, Project Manager, Soldier Warrior said, "Whenever we provide power to soldiers, we need to keep in mind they are going to have to carry it into the fight and then carry it back out again. The expeditionary environment has got to be first and foremost in our mind."

"It is no secret that we have energy issues. Those are exemplified once you introduce that expeditionary environment. All the same things we are trying to do as a nation in terms of trying to get around the energy issue are the things we have to do for our soldiers. We owe them the same sorts of efforts we are trying to do nationally."

Resolution activity

To address power requirements a new Soldier Power Working Group has been established in order to better address power as a growing issue in the provision of capability. A US Army Communications-Electronics Research, Development, and Engineering Center (CERDEC) led study in 2010 predicted an 85 percent increase in the batteries required by a unit to operate for a given time in 2015.

Today's average battery weight carried by a US Army soldier in Afghanistan is 10lbs, although some soldiers, based on their battlefield role, are carrying between 26-29lbs of batteries.

To further complicate the solution, there is the issue of wastage. Another CERDEC study of discarded batteries in Afghanistan found 50 percent of batteries had more than 50 percent of power left in them. Nett Warrior requires

two batteries to function for twenty four hours, with a three day mission in practice requiring eight batteries; the additional power carried is a consequence of soldiers making assumptions about contingencies in the field.

Addressing power requirements is directly linked to lightening the load and reducing the logistic burden with the latter having force protection implications in reducing the amount of convoy space required to ship batteries.

Work is being done to address these issues, the Nett Warrior Excursions, part of the programme's November Limited User Test (LUT) examined a range of lightweight power solutions including atomising fuel generators solar panel, wind power and fuel cell technologies. There is also a Power Industry Day in Fort Benning in June for austere power. Science and technology funding on soldier power has been available via stimulus money from the Office of the Secretary of Defense.

Today's soldiers also use 18 preferred batteries types although there are 118 distinct National Stock Numbers for batteries. There is currently no single authority for battery management although PM Mobile Electric Power is trying to stand up an organisation to address that. Rather than a common battery, it is currently planned that there will be a preferred list of batteries. Unless there is compelling reason at the requirements level why a non standard battery needs to be used in a particular programme, solutions from this list will have to be used.

In addition to technology solutions there are also efforts to work on non material means of managing power, notably enhanced training in leadership and capabilities.

Col. Wil Riggins

The Nett Warrior solution undertook their Limited User Test over several weeks in November. At the very end of that process, there were a number of excursions including power. The topic was broken down to three categories;

soldier worn power, portable charging for squad level and below and unit level charging for larger units.

The Excursion was used as a co-operative opportunity to bring good ideas together on power and energy supply for the dismounted soldier from industry, allowing industry to bring in ideas to be used by soldiers after safety certification was undertaken by the Army.

The purpose was simple. Col. Riggins said, "Take [power solutions] out in an operational environment, train with them and give [industry] direct feedback in terms of what they liked, didn't like and what they thought they could improve on."

"We got some great feedback from soldiers. I would say categorically, the kinds of things they were looking for was as low a weight as possible. It is not all about the weight. If the capability is significant, they will take it. Even when you are talking about weight, it is weight and bulk. You may have something that is lightweight but sticks out like a sore thumb when you are getting in and out of Stryker vehicles."

A conformal battery, used during the Excursion is now being deployed to Operation Enduring Freedom. There is no significant change in energy density in the device, the capability is all about ergonomics. Col. Riggins said, "We are repackaging it because we want to get that bulk down, the weight density is what it is, but keeping it closer to the body and being less intrusive to the soldier operating in that environment is going to be a welcome change from their perspective. The initial feedback says that is exactly what we are going to see."

"An App for That"

The Excursion is part of a wider effort to explore how to decouple the need for new capability to be associated with a new piece of hardware and delivery of new capabilities through Apps.

▶ Col. Riggins said, "We need to adopt the commercial strategy of, " 'We've got an app for that', we have got to get out of the mindset that a new capability demands a new piece of hardware and new power consumption."

"More is being done now with software and applications on one piece of hardware than has ever before and you are seeing that more and more with the explosion of smart device technology. We have got to do the same thing. As we go forward with Nett Warrior, we are looking at taking what were separate components to communicate, interface with computer systems and have situational awareness displays and merging them into one."

"When reports are generated by one of our enhanced vision devices, rather than have its own transport and formatting, we want to make that an application in a peripheral that works with the Nett Warrior systems, making it the hub. That is one of the ways that we are going to get around the issue of having so much additional hardware, weight and power consumption: more software, less hardware."

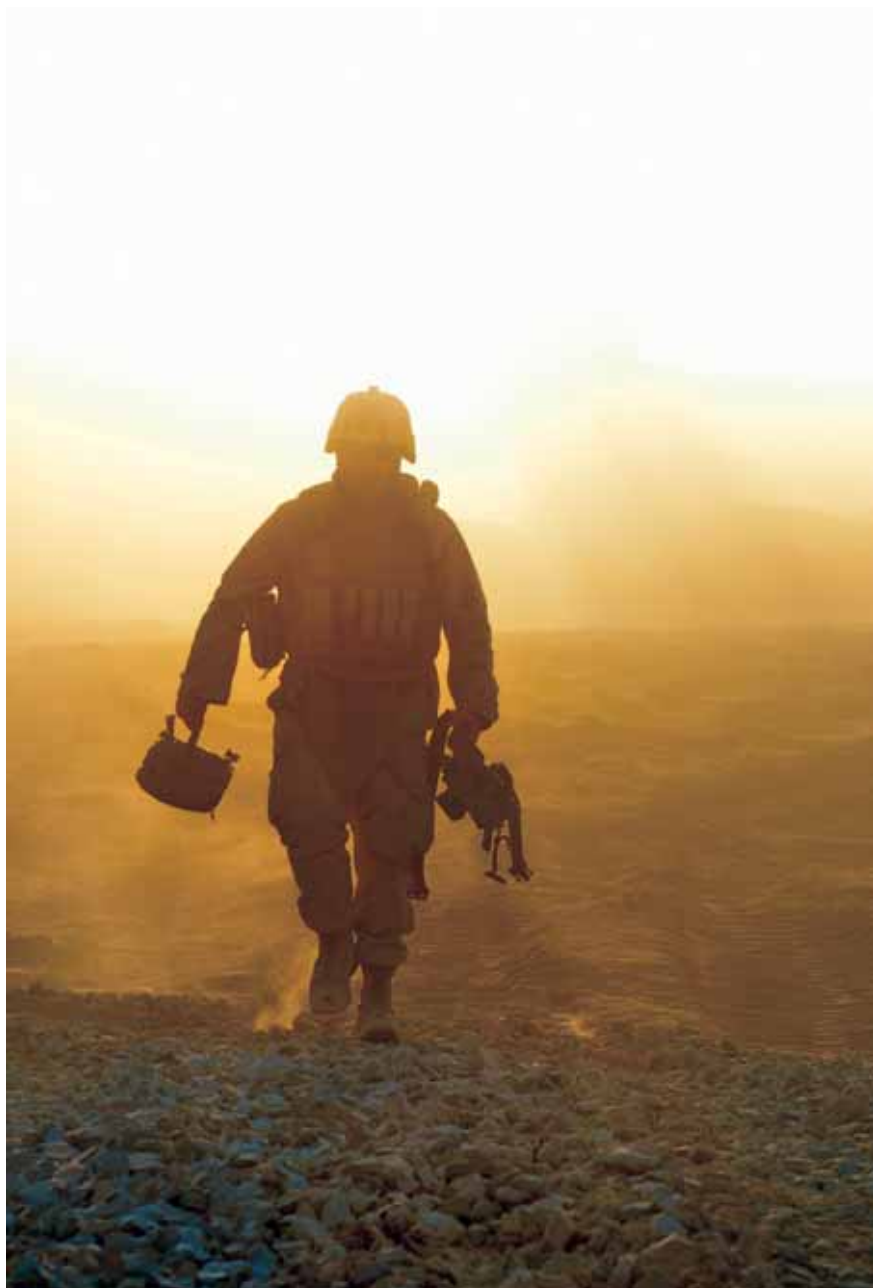
Requirement

The technology goals for power are increased energy density and reduced size and bulk and that will be achieved through increased and improved integration.

Col. Riggins said, "For us, integration means you look at everything a soldier has got to wear or carry to go into combat to make him lethal, survivable and able to operate in any environment. That is our platform and starting point for integration."

"We have to be novel in providing capability to these soldiers and we have to think of different ways of providing that capability than we have in the past. We want to use systems efficiently and reduce the logistical burden. At the end of the day we are engaged with the populace and breaking contact for power resupply is something we have to stop doing."

"At some point, the logistical burden becomes greater than the benefit from all these different configurations of batteries. Within the framework of the batteries that do exist, based on what we saw during these Excursions, there is a lot of room for things like repackaging." ■



PEO Soldier is looking at a range of power solutions for the dismounted soldier, operating in austere environments with the Nett Warrior Excursion in November being just one part of the strategy (c) DoD