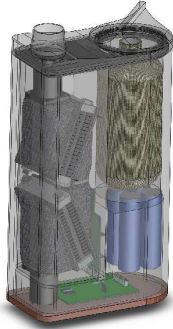


SPP: Portable Power Technologies / Dismounted Soldier Power

Portuguese Military Program

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Abstract:



The project aims at the development of a portable power system as standard equipment for defence use, and is being developed by a Portuguese consortium led by SRE, a fuel cell developer, LNEG (Portuguese National Laboratory for Energy and Geology) and EID (Electronics and Telecommunications for Army) through a SRE / Ministry of Defence contract. The system uses a SRE H₂ PEM Fuel Cell and a Li battery buffer (30Wh). The fuel is provided by an on board H₂ generator using NaBH₄ and water, developed by LNEG, aiming to provide 72h autonomy to the dismounted soldier. It considers a batch producing module concept (100gr of NaBH₄ = 250 L of NH₂, 8h autonomy), i.e. nine packs of 100gr of NaBH₄ will provide the required autonomy. Main project constraints and challenges are the power density (both gravimetric and volumetric) and the operation under severe atmospheric conditions (negative temperatures). A field test pre-series shall be done by the end of 2010 with commercialization foreseen by early 2012.

Operational Specifications The operational specifications considered for the project took into consideration the work being done at NATO regarding the energy requirements of the dismounting soldier:

- Autonomy- 72h
- Average power- 30W
- Peak power (10% of the time) 50W
- Temperature range: between -30°C and +60°C,
- Volume < 5 dm³
- Weight < 3,2 Kg
- Other requirements: to keep working during 1 hour when dived.

The proposed Portable Energy System

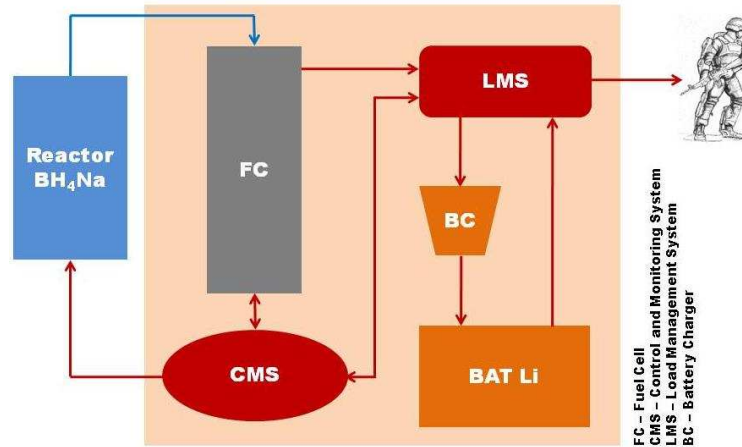


Fig 1.- Schematic diagram of the proposed power system using PEM fuel cell technology and on-demand hydrogen from sodium borohydride.

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