

REQUEST FOR INFORMATION (RFI)

INTRODUCTION:

This announcement constitutes an RFI notice for planning purposes. This is NOT a Request for Proposals. NO SOLICITATION DOCUMENTS EXIST AT THIS TIME. This RFI does not constitute a commitment, implied or otherwise, that the Office of Naval Research will take procurement action in this matter. Neither ONR nor the Government will be responsible for any cost incurred in furnishing this information.

The Office of Naval Research in support of USMC technology requirements is interested in understanding the currently available technologies that could enhance the logistics sustainability of remote Forward Operating Bases (FOBs) engaged in combat operations. Specific areas of interest for this RFI include 1) water purification and distribution, 2) electric power generation and distribution, and 3) energy efficient structures. Technologies of interest are those that would most effectively enhance self sufficiency of a Forward Operating Base roughly the size of a Marine Corps Company (approximately 200 Marines). Information is requested in the form of brief product descriptions.

GENERAL BACKGROUND:

The remote locations of USMC Forward Operating Bases create significant challenges for logistics support of combat operations. These FOBs are currently heavily dependent on large, long-distance truck convoys whose cargo is dominated by bottled water and bulk fuel. Convoy routes through unsecured areas are frequently hazardous, and transport is always expensive. The delivered cost of water or fuel can easily total ten to a hundred times its original purchase price. General strategies for reducing the logistic demand for water and fuel include 1) utilizing existing assets in a more energy efficient manner, and 2) wherever feasible, scavenging water and/or energy from locally available sources.

The Marine Corps is in the process of initiating dramatic steps toward rapidly improving the energy and water self-sufficiency of Forward Operating Bases. Towards this end, plans have begun for establishing an experimental facility at the Marine Corps Base Quantico for evaluating currently available devices and systems. This facility, called the Experimental FOB (ExFOB), will provide a simulated USMC Company-sized FOB environment suitable for demonstrating the operational efficacy of currently available products. The information received in this RFI may be used to help identify technical solutions suitable for rapidly enhancing water and energy related FOB operations. Information received may ultimately result in requests for equipment manufacturers to demonstrate their technologies at the ExFOB at no cost or risk to the Government, possibly as early as February 2010.

SPECIFIC INFORMATION OF INTEREST:

Water Purification and Distribution: The Marine Corps has Tactical Water Purification Systems (TWPS) capable of meeting the near term overall demand for bulk potable water at locations where either surface or underground water sources are available. These reverse osmosis units deliver approximately 1500 gallons per hour. Since appropriate local water sources are frequently available, full exploitation could significantly reduce the requirement to deliver

bottled water. Furthermore, depending on the water source, filtration alone without reverse osmosis may be sufficient to ensure safe drinking water. Regardless of the purification approach, the replacement of factory bottled water with locally purified bulk water complicates storage and distribution to individual Marines. Sanitary storage of locally purified water is currently achieved with chemical sterilization, creating a taste that many find objectionable. Furthermore, locally purified bulk water is currently stored in large bladders, and consequently lacks the scalable distribution convenience (from pallet to case to individual Marine) of factory bottled water.

Current logistics planning factors assume each Marine will require 20 gallons of potable water per day. This means that any solution (or combination of solutions) must be capable of producing and storing 4,000 gallons of potable water within a 20 hour period each day, allowing time for daily maintenance and cleaning of equipment.

Products that can currently provide the following capabilities are of interest:

1. Must be completely transportable by small tactical vehicle, rotary wing, tilt-rotor aircraft or towed behind a small tactical vehicle
2. Field portable water packaging and storage capability
3. Small scale (Platoon and Squad-sized) water purification devices facilitating a more distributed (as opposed to centralized) water purification capability with outputs in the general range of 75 to 125 gallons per hour
4. Energy efficient alternatives to reverse osmosis for purifying locally available surface and ground water
5. Alternatives to (bad tasting) chemical sterilization
6. Energy efficiency enhancements to reverse osmosis addressing pre-filtration effectiveness, membrane transfer efficiency, or high pressure energy recovery
7. Water recovery via condensation from generator exhaust, environmental control units (ECUs), or air (provided that a reasonable contribution to total water requirements as noted above can be practically achieved in a desert environment).
8. All technical solutions must either inherently provide the capability to produce safe drinking water in a Chemical Biological warfare environment, or be capable of being fitted with appropriate Chemical Biological protection/filtration systems.

Electric Power Generation and Distribution: Electric power at Forward Operating Bases is presently provided by motor generator sets of various sizes ranging from 2kW to 100kW. These generators can be fueled with either diesel or JP-8, a common military logistics fuel. The JP-8 is delivered via tanker truck over long distances. Generators frequently must be operated at suboptimal capacity, resulting in wasted fuel consumption.

Current planning factors assume that each Company size FOB will require 1000 kilowatt-hrs of electric energy consumption per day.

Products that can currently provide the following capabilities are of interest:

1. Autonomic phase matching, load sharing and/or load shifting between coupled generators connected in a power distribution grid so as to optimally match a distributed FOB generation capability with distributed FOB loads

2. Hybrid generation and storage for generators that are not connected to a load sharing grid
3. On-site synthesis of bio-fuel substitutes for JP-8 from locally available crops
4. Renewable power (solar, wind) conversion devices in the 2kW to 100kW range
5. Generators capable of operating from a variety of thermal sources including combustion of logistic fuels, combustion of locally produced bio-fuels, incineration of trash, or concentrated solar radiation
6. Waste to energy production capability in the 2kW to 100kW range
7. Energy efficient/sufficient Environmental Control Units (ECUs)
8. Small scale ground heat pumps capable of cooling or heating a general purpose medium size tent
9. Fuel cell systems (including fuel preparation as may be required) in the 1kW to 10kW power range, capable of providing 24VDC or 120VAC, and using either JP-8 or a specialty fuel that does not adversely affect the safety of transport or storage in a combat environment, as compared to JP-8

Energy Efficient Structures: The need to rapidly establish Forward Operating Bases for combat operations has resulted in temporary structures that are less than optimal from an energy perspective. This places a considerable burden on ECUs as they struggle to cool or heat interior spaces. One approach has been to spray tents with insulating foam. While this short-term solution dramatically improves the tent's insulation, it also prevents the tent from ever being disassembled. Alternative approaches for rapidly constructing energy efficient structures are sought.

Products that can currently provide the following capabilities are of interest:

1. Lightweight mobile thermally insulated structures
2. Structural concepts that passively capitalize on the thermal mass and thermal insulation properties of locally available soil
3. Cooling concepts that passively or actively capitalize on the subsurface thermal mass and thermal insulation properties of the ground beneath FOB structures
4. Devices that efficiently exploit spot cooling via direct conduction where appropriate as opposed to volumetric cooling via air convection
5. Energy efficient lighting

CONTENT AND FORMAT OF PRODUCT DESCRIPTIONS:

The electronic copy of responses is to be in Microsoft Word 2003, Microsoft Word 2007 or Adobe Acrobat 9 compatible format using a size 12 font with one inch margins. Following a review of the responses received, ONR may elect to request additional information, or schedule one-on-one meetings with some respondents to gain additional information about their proposed solution(s). A submission should include:

1. A cover letter (optional)
2. A cover page labeled with the heading "Experimental FOB Product Description", including the product name, the manufacturer, manufacturer's address, technical point of contact, telephone number and e-mail address, and at least one photograph of the item.
3. No more than three pages including:
 - a) Product technical description

- b) Narrative describing how the product could enhance the energy or water self-sufficiency of a Company-sized Forward Operating Base
- b) Product specifications with particular emphasis on quantitative metrics of energy consumption or savings over alternative solutions. Other specifications would include parameters such as dimensions, weight, capacities, input requirements, salient output capabilities, or other quantitative characteristics as appropriate.
- d) Relevant history of product (or similar product) utilization
- e) Catalog price or rough estimate of unit cost
- f) Earliest availability for a product demonstration at the Marine Corps Base Quantico, at no cost or risk to the Government

SUBMISSION DATE AND ADDRESS:

Electronic responses to this notice are requested to be emailed to one of the following appropriate e-mail addresses no later than Friday, January 15, 2010, 5pm EST. The subject line of the e-mail should contain the words "Experimental FOB Product Description."

Water Purification and Distribution:	EFOBwater@navy.mil
Electric Power Generation and Distribution:	EFOBpower@navy.mil
Energy Efficient Structures:	EFOBefficiency@navy.mil

Files too large for email can be sent via CD, by the same date to:

Commanding Officer
NAVFAC ESC
Attn: Code EX30 Technical Direction Agent
1100 23rd Ave
Port Hueneme, CA 93043

NOTE: This RFI is issued for the purpose of determining market capability of sources and does not constitute an Invitation for Bids (IFB), a Request for Proposals (RFP), a Request for Quotes (RFQ) or an indication that the Government will contract for any of the items and/or services contained in this notice. No solicitation document exists. All information received in response to this notice that is marked Proprietary will be handled accordingly. Responses may not include Classified material. Responses to this notice will not be returned. No reimbursement will be made for any costs to provide information in response to this announcement or any follow-up information requests. Information contained herein is based on the best information available at the time for publication, is subject to revision, and is not binding upon the Government. Availability of any formal solicitation will be announced under a separate Federal Business Opportunities announcement.