REQUEST FOR INFORMATION

The Marine Corps Systems Command, Quantico Virginia seeks sources and information on simulator systems and technologies that can be used to train United States Marines on Route Reconnaissance and Clearance (R2C) operations and systems. The simulators, or system of simulators, would be used as a part of initial Military Occupational Specialty training at the Marine Corps Engineer School (MCES), as well as refresher and unit training in the Operating Forces (OpFors). RFI responses will support a Business Case Analysis that is evaluating the use of simulators by the Marine Corps for training Marines on the current and future R2C platforms.

BACKGROUND

The R2C capability set is a Family of Systems (FoS) that helps mitigate the threat and use of explosive and non-explosive obstacles along routes in the Marine Air Ground Task Force (MAGTF) Area of Operation (AO). It is capable of performing route reconnaissance and clearance missions through detecting, interrogating, identifying, marking, reducing and clearing explosive and non-explosive obstacles in order to ensure the mobility of friendly forces. The R2C FoS will reside in Combat Engineer Battalions (CEB). Each set within the R2C FoS will consist of the following: (2) Category I Mine Resistant Ambush Protected (MRAPs), (2) Category II MRAPs, (1) Category III MRAP, (3) Light Weight Mine Roller System (LWMRS), (1) Vehicle Mounted Mine Detector (VMMD) set (which consists of (2) Husky vehicles, (3) Mine Detonation Trailers (MDT) and (1) Red Pack maintenance trailer), (2) R2C Robots, (2) Lightweight Interrogation Arms, (1) Automated Route Reconnaissance System (ENFIRE), (2) Vehicle Optics Sensor System II, (2) Lightweight Route Clearance Blades, (4) Driver Vision Enhancement Systems (DVES) and (4) Counter Radio Controlled Improvise Explosive Device (IED) Electronic Warfare devices (CREW).

Currently, the MCES training on R2C is conducted through a combination of classroom courses, practical application with the R2C FoS, and field exercises. This training is conducted in two phases. The first phase consists of instruction on the planning and supervision of Route Clearance operations, the licensing on the motor vehicles and engineer equipment, and instruction on the qualifications and Tactics, Techniques and Procedures (TTPs) related to the use and operation of R2C vehicles and equipment. Phase two consists of a two-day/two-night field exercise that tests the collective ability of the route clearance team (both the leadership and the operators) to locate, interrogate, and report simulated IEDs in an explosive hazard environment by applying R2C TTPs during both day and night conditions. The OpFor have similar training requirements for individual and unit sustainment training tasks that must be revisited on time intervals that vary from 3 to 12 months.

The Marine Corps faces various challenges in meeting its R2C training objectives, to include: the equipment is expensive to sustain from a Total Ownership Cost perspective, there are various training risks associated with R2C equipment training, and individual and unit training area requirements may be difficult to meet realistically.

The Marine Corps is evaluating potential inclusion of simulators in order to fulfill the current R2C training requirement while increasing training value, lowering Total Ownership Cost, and reducing risk.

SIMULATOR REQUIREMENTS

The simulator should provide the following capabilities:

The ability to simulate the following Vehicles:

- *Protected Security Vehicle*. All Mine Resistant Ambush Protected (MRAP) vehicles are used to provide mobility in areas where mines and Improvised Explosive Devices (IEDs) are known threats. The Protected Security Vehicles are CAT I and CAT II ("Cougar") MRAPS that can be outfitted with various sensors, armors, weaponry, and systems.

- *Explosive Hazard Clearance Vehicle.* This vehicle is a CAT III ("Buffalo") MRAP that can be outfitted with sensors and systems to support the interrogation of potential threats, as well as host the command and control operations within the R2C mission. This vehicle is also outfitted with a large interrogation arm.
- *Vehicle Mounted Mine Detector (VMMD).* A complete VMMD system includes two mine detection vehicles ("Huskies"), three MDTs, and one spare wheel module called a "Red Pack". These systems have the ability to detect buried metallic mines, IEDs, and unexploded ordinance (UXO) using pulse induction type mine detectors and detonating pressure fused mines with mine detection trailers (MDT).

The ability to simulate the following Systems (which will be attached to or held within the vehicles listed above)**:**

- Husky Mounted Detection System (HMDS). The HMDS is mounted on the front of a VMMD and provides a GPR capability for standoff detection of buried threats to include low metallic IEDs.
- *Lightweight Interrogation Arm.* This is a complimentary system to the primary CAT III ("Buffalo") arm and can be mounted on the front of the Protected Security Vehicles. This arm will have tools for probing, digging, and lifting debris to expose objects on roads, soil, mud, rocks, and various types of materials. Tools on the arm include magnets, command-wire cutter, pressurized-high velocity air/water cannon, hook and line, rake, metal detector, chemical detector, and camera.
- *Driver Vision Enhancement System (DVES).* Provides enhanced visibility for the driver at night for a greater distance than other night vision devices. The DVES can be mounted on any of the Protection Security Vehicles.
- *R2C Robot with manipulator arms*. The R2C Robot ("iRobot 510 Packbot") provides remote stand-off interrogation and reduction of explosive obstacles. Remote stand-off interrogation and reduction shall be in all visibility conditions, day and night, with a degraded capability in poor weather conditions.
- *Light Weight Mine Roller System (LWMRS).* Used to detonate and neutralize buried pressure/fused mines and other explosive devices.
- *Lightweight Route Clearance Blade (LWRCB).* This is a device that can be attached to any of the Protected Security Vehicles. It can be fixed at a straight forward angle (dozer-like) or articulate up to 25 degrees (snowplow-like) in order to clear routes of debris and hazards.
- *Automated Route Reconnaissance System/Reconnaissance and Surveying Instrument Set (ENFIRE).* A tactical engineering tool set designed to collect and disseminate engineering information. It receives, analyzes, disseminates, stores, and archives routes, terrain, and related geospatial data.
- *Counter Radio Controlled IED Electronic Warfare (CREW).* A vehicle-mounted system that aids in the interruption of the link between initiators and receivers of remotely triggered explosive devices.

  Vehicle Optical Sensor System II (VOSS II). The VOSS II can be mounted on any of the R2C vehicles and provides simultaneous optical and thermal images in both day and night conditions. VOSS II provides 360 degrees of visibility from a distance of 5 meters to almost 1000 meters. This enhanced images can be viewed by up to two members of the crew within the equipped R2C vehicle.

The ability to simulate various environments and operating conditions, to include:

- Various types of terrains, surfaces, and scenarios (e.g., dirt/gravel/concrete roads, road banking, high and low inclines, open roads, open fields, narrow valleys, urban areas) that cover the Range of Military Operations (ROMO)
- Current and accurate world maps
- Various weather conditions (e.g., sun, rain, snow)
- Night and day conditions

The ability to simulate the effects that the environments and operating conditions will have on the vehicles and systems, to include:

- Slippery roads
- Vehicle rollover
- Damaged equipment (can be result of environment or misuse by the trainee)
- Reduced visibility/operability

The ability to simulate various types of threats and hazards, to include:

- Metallic, low metallic, and non-metallic hazards
- Mines and pressure-plate, tripwire and other IEDs
- Light debris to heavy obstacles
- Single threat (e.g., a mine or IED) to multiple threats (e.g., minefield)
- Radio controlled, electronically initiated, signature initiated, fused, and trip-wire initiated explosive hazards
- Surface and buried, on-route and off-route hazards
- Operating in a combat situation

The ability to simulate collaborative mission planning, execution, and after action review. This would include communication between the R2C family of vehicles via radio and computer networks.

The ability to be scalable, to include:

- Update of simulator to include future R2C FoS Capabilities. This may possibly include a remote R2C capability, a Vehicle Mounted Ground Penetrating Radar (GPR) system, enhanced fusion of data from various sensor equipment, installation of additional sensors on new or existing equipment, an ability to perform R2C functions at an enhanced standoff distances, access to real-time situational awareness information, and/or an ability to virtually and physically mark objects and routes.
- Marine Corps ability to rapidly revise the simulations and create new simulator scenarios, vehicles, equipment, and other factors.

The ability for an instructor/moderator to control and monitor a training simulation. This would include the ability to provide overall driver-operator initialization, setup and control of a training simulation, as well as the ability to control the hazards encountered, the environmental conditions, and the R2C equipment in the simulator.

The ability to provide feedback. This would also include the ability to provide feedback to the instructor and/or the trainee after a simulation, such as video recording of the simulation and the trainee, print outs, statistics, and a score.

RESPONSES

Responses to this RFI should provide detailed answers to the following questions. If a capability level has not yet been achieved but is projected or planned, please indicate and provide forecasted fiscal year:

Technology/System Questions:

1. How well do your current simulator systems achieve any of the above mentioned capabilities? If recommended, how would you modify those systems to meet the Marine Corps requirements?
2. What is your proposed solution for achieving some or all of the requirements described above? For example, is the solution a single simulator that can replicate all vehicles and systems within the R2C FoS or are there multiple, integrated simulators?
3. What is the operations concept for the simulator(s) (e.g., how is it employed, how many operators are required to operate the system)?
4. Is the simulator currently employed by any other organization?
5. Can the simulator integrate with any other simulator systems?
6. What is the technology maturity or technology readiness level (TRL) of the simulator and what are the maturation plans?
7. What are the dimensions, weight, and power supply requirements of the recommended simulator(s)?
8. What is the set-up cycle time for training sessions?
9. How many students can be trained at a time?
10. What is the response time of the simulator (e.g., little to no lag time)?
11. What is the resolution of the simulator (quality of graphics)?
12. What are the known limitations of the simulator? For example, are there any situations that the simulator would be unable to replicate realistically?
13. What are the benefits of using a vehicle simulator as opposed to using the actual equipment to train an operator?
14. What feedback information is provided from each training session (be specific)?
15. What is the maintenance concept for the system? What is the reliability of the simulator in terms of the following: Mean Time to Repair, Mean Time Between Failure, Mean Time Between Preventative Maintenance?
16. What are the power, space, and other logistical requirements of your system(s)?
17. How is the system upgraded, modified, and improved?
18. How many people does it take to operate and maintain your system daily?
19. What is the required skill level for the maintainer(s)/operator(s) of the system(s)?
20. What is the delivery schedule capability?
21. What kind of maintance plan does your system have? (i.e. responsiveness of technicans to respond and troubleshoot/fix system- oncall-weeks-months-etc).

Cost information

22. What are the Rough Order of Magnitude (ROM) Research, Development, Test and Evaluation (RDT&E) costs associated with the simulator(s)? How do these costs relate to the Simulator Requirements described above?
23. What are the ROM costs associated with training the user how to use the simulator? What is involved in that training?
24. What are the ROM initial and procurement costs based upon quantities?
25. What is the ROM total unit cost of each simulator? What is the breakdown of costs per procurement stage (e.g., production lead time, production capabilities, unit costs, costs associated with integrating equipment onto existing vehicle mockups)?
26. What are the purchasing and/or leasing options?
27. What are the ROM Operation and Maintenance Costs? What are the costs for operator and maintenance support (e.g., consumable and reparable costs, depot maintenance costs, refurbishment costs, major overhaul activity costs, contractor support requirements, standalone as well as distributed training and setup costs)?
28. How quickly can the system be restored to operation if a part/system fails?
29. What are the types of costs incurred for setting-up the simulation each time a training session gets underway?
30. Are there any additional costs that will be incurred to develop, purchase, operate, and maintain the simulator for training purposes?
31. What is the ROM projected cost of software/hardware upgrades over time to manage obsolsense.
32. List the cost drivers that have the greatest affect on your proposed approach and the ROM costs that your firm estimates would be incurred by each?
33. What do you view as being the greatest cost drivers in terms of material costs?
34. What do you view as being the greatest cost drivers in terms of performance requirements?

PREPARATION, DELIVERY, AND PROCESSING

There is no page restriction associated with this RFI; however, an executive summary, not to exceed five (5) pages, should accompany each submission. Interested firms are requested to submit a capability statement/package, outlining their ability to meet or exceed this potential requirement.

All submissions shall be unclassified and submitted either by mailed CD-ROM or electronic submission by email. Email is the preferred method. Electronic submissions should be sent to stefanie.conway@usmc.mil and also Cc: jonathan.york@usmc.mil. The email subject line should include the following text: "M67854-12-I-5042, R2C Training Simulator (company name here)." All requests for further information must be in writing via email to the above email addresses.

If mailing submission, please mail a hard copy version along with one electronic (soft) copy submitted on a CD-ROM formatted for a personal computer. Responses to this RFI shall be mailed to the following: Marine Corps Systems Command, Attn: Stefanie Conway, 2200 Lester Ave, Quantico, VA 22134-6050 **no later than 16 April 2012 by 2:00pm EST**.

This Request for Information (RFI) is for planning purposes only and shall not be construed as a Request for Proposal or as an obligation on the part of the Government to acquire follow-on acquisition. The Government does not intend to award a contract on the basis of this RFI or otherwise pay for the information requested. No entitlement to payment of direct or indirect costs or charges by the Government will arise as a result of submission of responses to this RFI and Government use of such information.

The Government uses support contractors and consultants at times in evaluating information including Market Research responses. Responses that contain proprietary information will only be analyzed by contracted support personnel after binding non-disclosure agreements with them have been reached and signed. Data analyzed by contracted personnel will be maintained in the same manner as received by Government personnel in accordance with 18 U.S.C. §1905.

The Government recognizes that proprietary data may be part of this effort. If included, please clearly mark such restricted or proprietary data and present it as an addendum to the non-restricted/non-proprietary information. NO SOLICITATION DOCUMENT EXISTS AT THIS TIME.

MARCORSYSCOM point of contact for questions regarding this RFI is:

Stefanie Conway: (703) 432-3451, email: stefanie.conway@usmc.mil