

## **Capability Request for Information (CRFI)**

**FA8650-19-S-9344**

### **Air Force Strategic Development Planning & Experimentation (SDPE)**

#### **Counter-Cruise Missiles (C-CM)**

## **1.0 General Introduction**

The Air Force's Strategic Development Planning & Experimentation (SDPE) office is conducting market research analysis in support of an anticipated experiment to Counter Cruise Missiles (C-CM). This experiment is part of a campaign of experiments directed by the Air Force's Capability Development Council (CDC). Recent guidance through the Air Force Warfighter Capability (AFWIC) office and strategic guiding documents such as the Directed Energy Weapons Flight Plan, signed by the Secretary and Chief of Staff of the Air Force in May of 2017, have prioritized the base defense mission for the Air Force. The C-CM experiment will focus on understanding and assessing the operational adequacy of effector technology (i.e. Directed Energy (DE), Kinetic, and non-Kinetic systems), supporting sensors, and command and control systems to defeat cruise missile threats. Additionally, the experiment will investigate the operational suitability of said systems of systems and their ability to integrate within the existing ABAD construct of Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy (DOTMLPF-P) to support Active Air and Missile Defense (AMD). The C-CM experimentation campaign is complementing existing C-CM efforts as part of a larger scale Order of Battle (OOB).

The objective of the C-CM experiment is to exercise the entire kill chain with effectors, and supporting sensors and command and control systems, in an active defense against cruise missiles. The intent is to assess the capabilities of effector technologies, supporting sensors, and command and control systems to perform/support functions related to the Joint Engagement Sequence (JES), while in the hands of warfighters. Throughout the experiment, warfighters will operate and interact with the effector systems, supporting sensors, and command and control systems in operationally relevant environments, providing feedback on system capabilities, functionality, and supportability. These operational experiments will be used, in conjunction with Modeling, Simulation, and Analysis (MS&A) to provide the Air Force's CDC with the information needed to design future acquisitions and/or to initiate rapid acquisition(s) of existing systems. SDPE is issuing this Capability Response for Information (CRFI) to solicit technically mature and cost-effective effector solutions, supporting sensors, and command and control systems to enable this experiment starting in FY20. SDPE's interest is focused on exploring fieldable prototype c-CM systems, including supporting sensors, and command and control systems, that could be used in developing future acquisitions or rapidly transitioned to theaters of interest.

***THIS IS A CAPABILITY REQUEST FOR INFORMATION ONLY.***

This CRFI solicits information from the Department of Defense (DoD), other government agencies, and U.S. companies who can provide full or partial material solutions which may involve design, development, prototype(s), experimentation, developmental and operational testing, and production of end items to offer solutions or added capabilities for DEW systems to defeat cruise missile attacks.

This CRFI is issued solely for information and planning purposes. It does not constitute a Request for Proposal (RFP) and/or solicitation or a promise to issue an RFP and/or solicitation in the future. This CRFI does not commit the Government to contract for any supply or service whatsoever. Further, SDPE is not at this time seeking proposals, and will not accept unsolicited proposals. Responders are advised the U.S. Government will not pay for any information or administrative cost incurred in response to this CRFI. All costs associated with responding to this CRFI will be solely at the responding party's expense. Be advised that all submissions become Government property and will not be returned.

Not responding to this CRFI does not preclude participation in any future RFP/solicitation, if any is issued. Small Businesses are encouraged to provide responses to this CRFI to assist SDPE in determining potential levels of competition available in the industry, as well as helping to establish a basis for developing any subsequent potential subcontract plan goal percentages. In accordance with Federal Acquisition Regulation (FAR) 15.201(e), responses to this notice are not offers and cannot be accepted by the U. S. Government to form a binding contract.

It is the responsibility of the interested parties to monitor these sites for additional information pertaining to this CRFI. Responders are solely responsible for all expenses associated with responding to this inquiry. This announcement is not to be construed as a formal solicitation. It does not commit the Government to reply to information received, to later publish a solicitation, or to award a contract based on this information. All products must comply with the "Buy American Act".

## **2.0 Proprietary Materials Protection**

This notice is part of Government Market Research, a continuous process for obtaining the latest information from industry pertaining to current and near-term capabilities that provide systems with the required performance as well as the ability to support potential acquisition of a desired number of systems. The information collected may be used by the government to explore acquisition options and strategies for the possible approaches within the military. All information received in response to this CRFI that is properly marked, as "proprietary" will be handled accordingly. Proprietary information must be clearly marked on the outside container and on the materials inside. The Government shall not be liable for, nor suffer any consequential damages for any proprietary information that is not properly identified.

CRFI responses that contain information marked as “proprietary,” will be protected as proprietary information. Such information will be reviewed by a team comprised of government as well as contractor personnel hired to provide technical assistance for the Government’s preparation of an acquisition strategy. All members of the team will be reminded of their obligation to protect such information to the maximum extent permitted or required by the Economic Espionage Act, 18 U.S.C. 1831 *et. seq.*, and other applicable statutes or regulations.

Additionally, government members will be reminded of their obligations to afford protection under the Trade Secrets Act, 18 U.S.C. 1905. All contractor members are required to protect the information by the terms of their contracts. Responders are advised that employers of commercial firms under contract of the government may be used to process responses, provide technical assistance and/or other administrative duties requiring access to other contractor’s proprietary information. These support contracts include non-disclosure agreements prohibiting their contractor employees from disclosing any purpose other than which it was furnished.

### **3.0 Description**

SDPE is seeking information on counter-cruise missile prototypes, to include supporting sensors, and command and control systems, with the potential to defeat cruise missile threats. Specific cruise missile threats and engagement profiles investigated during this experiment will be influenced by the responses to this RFI as well as any related Air Force studies. SDPE anticipates conducting an experimentation effort that assesses effector technology, supporting sensors, and command and control systems technology maturity, usability, and suitability while also answering learning objectives specific to DOTMLPF-P. Desired outcomes from each system assessment will relate to performing the C-CM mission. These outcomes will enable system specific concepts of employment (CONEMP), concept of operation (CONOP), and the tactics, techniques, and procedures (TTP) to be developed. The mission focus is on the defense of forward airbases, acknowledging that effectors, supporting sensors, and command and control systems will be part of a larger order of battle with kinetic systems structured to protect these sanctuaries. Exploring the potential synergy of DE, Kinetic, and non-Kinetic systems for this mission is another key element of this experiment.

Desirable prototype effectors, supporting sensor, and command and control systems explored would be able to successfully integrate with existing missile defense equipment to include, but not limited to: target acquisition radars, target engagement radars, electro-optical/infrared sensors, and C2 network architectures. Electrical power and thermal management required to meet operational duty cycles for the proposed C-CM system(s), must be included. Systems of interest will be able to provide Risk Management Framework (RMF) artifacts to include, but not limited to: system security plan, configuration plan, risk management process, security controls, system diagram, hardware lists, data flow diagrams, and software lists.

Additionally, SDPE is interested in effectors, supporting sensors, and command and control systems that are designed to be modular and modified to support technology advancements, alternative system architectures, fixed and transportable/ mobile platform basing options, target

expansion, and operate in varying environments. For example, an area of interest for a high energy laser (HEL) system is its current/future compatibility with potential future airborne relay mirror options, with a cooperative adaptive optics uplink to the relay. Additionally, systems that demonstrate low life cycle costs, high reliability, and minimal support equipment requirements are highly encouraged to respond.

Candidate effector systems, supporting sensors, and command and control systems would have empirical Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC) data demonstrating compatibility with existing military systems in accordance with MIL-STD-461G. The systems should not cause interference within a reasonable keep out zone of other military systems.

Ideal systems should take into consideration airspace deconfliction in traditional battlespace. For example, the ideal HEL systems would be compatible with existing and planned airspace deconfliction and predictive avoidance measures (PAM). Ideal high power microwave and radio frequency/electronic warfare systems would have fully characterized beam patterns, to include side and back lobes, in a complete 360-degree beam pattern mapping, and minimum safe distances for electronic devices.

The Government will compile and assess the information provided in response to this CRFI in terms of demonstrated and predicted performance, preliminary supportability analysis, Technology Readiness Level (TRL), Manufacturing Readiness Level (MRL), and Integration Readiness Level (IRL).

## **4.0 Requested Information**

### **4.1 Written Responses**

Responses must address the following overall characteristics/constraints.

*Note: Detailed requirements for the DEW systems can be found in Annex 1.*

- General system characteristics, dimensions, features, and equipment fit
- General Production Schedule(s) and Timeframe(s): Number of months after contract award required for delivery of one (1), five (5) and ten (10) units to understand the timelines for the Government to develop the appropriate logistics infrastructure, staff, and processes associated with bulk purchases
- Status of systems certification and accreditation to include Interim Authority To Test (IATT), Authority to Connect (ATO), Interim Authority to Operate (IATO), Authority to Operate (ATO), or schedule for testing accreditation.
  - Include phase of Risk Management Framework (RMF) and RMF documentation.
- How production quantities/lot buys could be structured for up to 100 systems to be delivered within two years (desired) – four (4) years (maximum) from delivery of first system

- Describe planned long lead-time items with schedule and costs for meeting the above production schedules
- Unit cost (dollars), total procurement cost of all systems and typical operating cost.
- Projected timeline to provide functional kill capability, if not able to address in system delivery
- Projected weapon system lifetime and life cycle costs
- Maintenance requirements
- Transportability requirements
- Cost of any additional required equipment (power supply, etc.) needed to support pre-emplaced or mobile platforms to meet the system requirements listed in Annex 1
- Projected maintenance infrastructure – processes, procedures, spares and Rough Order of Magnitude (ROM) costs to support:
  - Organizational level (O-level) Contractor Logistics Support (CLS) in place 3 months before first weapon system delivery
  - On-site 12 months CLS, transitioning to USAF organic O-level maintenance
  - Spare Parts package commensurate with OPTEMPO
  - Plan for Contractor provided maintenance
- Projected training infrastructure – processes, procedures, throughput and ROM costs to support:
  - Training required Maintainers for O-level maintenance
  - Maintenance Program of Instruction
  - Personal Computer (PC) based system simulators (12 licenses)
  - Advanced ground-based simulator
- Address any safety concerns or limitations
- It is anticipated that many candidate systems will not meet some of the requirements listed in the Annex. In this event, please provide plans for meeting these requirements, including schedules for compliance to include any additional testing or certifications required.
- If available, provide an operating handbook for the system as part of the CRFI response package.
  - **The handbook and/or manual does not count toward the page count limits for Section Two, detailed below**
- Provide system performance and usage data, where applicable, for turn-on time, power and thermal stability, time-to-target, ability to track, ability to detect and identify targets, shot-to-shot waveform variations, duration of use or magazine size if applicable, and duty cycle. This data should be for standard and non-standard day and night temperatures and for varying atmospheric conditions and altitudes.
  - **This data does not count toward the page count limits for Section Two, detailed below**

## **4.2 CRFI Response Section Composition**

CRFI responses must be comprised of two (2) sections as described below. Please limit responses to a page count of 5 pages or less for Section One and 25 pages or less for Section Two.

### **4.2.1 CRFI Response – Section One**

Provide administrative information in Section One of your response in a Microsoft Word compatible document. Address the following in Section One:

- Company Name
- Point of Contact (POC) name
- Mailing Address
- Overnight Delivery Address (if different from mailing address)
- Phone Number
- Fax Number
- E-Mail Address of POC
- Provide a statement that the respondent will allow or will not allow the government to release proprietary data to the government support contractors identified.
- Companies will provide plan(s) for complying with the Buy American Act

### **4.2.2 CRFI Response – Section Two**

Provide the information requested in section 4.1 above in Section Two of your response. Please provide responses in Microsoft Word compatible documents, Microsoft PowerPoint compatible presentations, Adobe .pdf files, Microsoft Excel compatible Spreadsheets and/or a combination thereof.

Submit responses in both electronic (soft) and printed (hard) copy forms. Submit electronic copies via email to:

[Michael.Jirjis.1@us.af.mil](mailto:Michael.Jirjis.1@us.af.mil) and [james.simonds.2@us.af.mil](mailto:james.simonds.2@us.af.mil)

**No Later Than (NLT) 4 OCTOBER 2019 @ 5:00 PM EST**

Title e-mail responses in the subject line of the e-mail as follows: “RESPONSE TO C-CM”

Additionally, provide two printed (hard) copies of each response either by certified mail or hand delivery to:

**SDPE**  
**1864 4<sup>th</sup> Street, Bldg. 15**  
**Wright-Patterson AFB, Ohio 45433**

NLT 4 OCTOBER 2019 @ 5:00 PM EST

**Questions: Verbal questions will NOT be accepted. All questions will be answered via posting answers to this FBO website; except as explained above. Additionally, questions must NOT contain trade secrets or classified information. The government reserves the right to not address questions received after 13 SEPTEMBER 2019.**

Responses from U.S. firms will be accepted to this C-CM CRFI. Responses to questions from interested parties will be collected, answered, and posted back to the FedBizOps (FBO) website as an amendment to this CRFI. Should proprietary information be involved, or the answer addresses a question unique to a certain company, the response will be provided on an individual and case-by-case basis. Post submittal, one-on-one information sessions with respondents are not anticipated; however, they may be offered to responders to clarify the Government's understanding of their submittal, the capability ramifications, or to discuss their business approach. Information feedback sessions may be offered to respondents after the CRFI assessments are completed.

Technical point of Contact:  
Mr. Jim Simonds, SDPE  
Bldg. 15, Room 41  
1864 4<sup>th</sup> Street  
WPAFB, Ohio, 45433  
[james.simonds.2@us.af.mil](mailto:james.simonds.2@us.af.mil)

This notice may be updated as additional information becomes available. For more information on "Directed Energy Counter-Cruise Missile" please contact the AF POCs using the email addresses listed below.

**AF Points of Contact (POC) for DE C-CM CRFI:**

Ms. Andrea Bublitz, Contract Specialist, 937-713-9866  
[andrea.bublitz@us.af.mil](mailto:andrea.bublitz@us.af.mil)

Mr. Paul E. Smith, Contracting Officer, 937.713.9974  
[Paul.Smith.23@us.af.mil](mailto:Paul.Smith.23@us.af.mil)

Mr. Jim Simonds, Technical Lead, 937.656.1874  
[James.simonds.2@us.af.mil](mailto:James.simonds.2@us.af.mil)

Dr. Michael Jirjis, Program Manager, 937.656.1639  
[Michael.Jirjis.1@us.af.mil](mailto:Michael.Jirjis.1@us.af.mil)

## 5.0 Summary

***THIS IS A CAPABILITY REQUEST FOR INFORMATION (CRFI) ONLY*** to identify capabilities that provide DEW system and acquisition options to acquire up to 6 Counter-Cruise Missile systems (C-CM) in support of operational base defense. The information provided in the CRFI is subject to change and is not binding on the government. SDPE has not made a commitment to procure any of the items discussed, and release of this CRFI should not be construed as such a commitment or as an authorization to incur cost for which reimbursement would be required or sought. All submissions become Government property and will not be returned.



## 6.0 ANNEX 1

### C-CM WEAPON SYSTEM REQUIREMENTS

#### **6.1 Critical Requirements - systems must meet all requirements listed below:**

1. Properly certified for day/night operational use.
2. Properly certified to meet acquisition requirements and allow for U.S. Military operation.
3. Systems/capabilities must meet U.S. government releasability/exportability requirements.
4. System must maintain a continual defensive posture at an operations tempo.
5. System must maintain a continual, 100% standby, defensive posture at an operations tempo. Systems must be capable of sustaining an eighty percent (80%) Fully Mission Capable (FMC) rate for the completion of missions under Instrument Meteorological Conditions (IMC), in the environmental conditions expected in Partner Nations (PN) Theatre of Operations (i.e. up to 50-degrees Celsius).
6. Capable of conducting operations from semi-prepared surfaces (dirt, grass, gravel, etc.) and/or from mobile platforms.
7. Capable of operating from an austere, forward operating base without any ground support other than electrical power and fuel for generators that is normally provided for deployed combat systems.
8. Capable of targeting, tracking and eliminating cruise missile target sets within an upper hemispherical field of view.
9. Controlled entirely from a single control station, located at the fixed site/platform or in/on a mobile platform.
10. Probability of Kill/Effectiveness (Pk or Pe) Indicator for system operator that shows when the cruise missile target has a >50% Pk or Pe and a >75% Pk or Pe, for current atmospheric conditions.
11. Capable of performing BIT (Built in Test) system diagnostics and troubleshooting.

#### **6.2 System Desired Requirements**

- Installable/removable from the platform as a single unit.
- Capable of being used by a security forces operator with limited engineering or directed energy experience.
- Ability to be easily maintained with minimum logistics foot print allowing for troubleshooting and repair to meet or exceed a FMC of 80%.

- Low Life Cycle Cost (LCC) – as compared to kinetic and non-kinetic weapon systems.

### **6.3 Additional Focus Points for Reviewers**

In addition to items found in Annex 1, Section 6.1 and 6.2, reviewers may be inclined to assess the following areas to discriminate highly-competitive effector systems. Note that fully integrated operational systems are of greatest interest, however systems that provide “open architectures” adaptable to the incorporation of more effective or versatile sub-systems, potentially from other providers, would be attractive.

1. Fire control and safety systems integrated in a base defense operation
2. Capability of operating the system in a variety of demanding platform vibration, acoustic and temperature environments
3. Instant on, no requirement for initialization, and no requirement for calibration or minimization of these areas
4. Low power consumption during any required “ready” mode
5. Identified system gaps and future system upgrades that are planned or in progress
6. System’s proposed should be available for field experimentation no later than late of FY20/early FY21
7. System’s ability to be transported, whether to a base and/or in and around a base, and whether it can be integrated on a mobile platform