REQUEST FOR INFORMATION

AFRL/RYZT
2241 Avionics Circle, BLDG 620, Area B
Wright-Patterson AFB, OH 45433

SYNOPSIS: Department of the Air Force, Air Force Materiel Command, Air Force Research Laboratory Sensors Directorate, AFRL/RY and the Sensors Program Office, AFLCMC/WIN in support of the AFRL/RYZ Plans and Advanced Programs Division are seeking information on how an interested contractor could integrate an Intelligence, Surveillance, and Reconnaissance (ISR) sensor system into a flight-worthy open architecture platform agnostic modular, reconfigurable, multi-sensor payload pod system, designated as the AFRL AgilePod™ system. The AFRL AgilePod™ system is designed to accommodate both the 33-inch (Class I) and 28-inch (Class II) turreted sensor systems.

PURPOSE: THIS IS A REQUEST FOR INFORMATION (RFI) ONLY. This RFI is issued solely for information and planning purposes – it does not constitute a Request for Proposal (RFP) or a promise to issue an RFP in the future. This request for information does not commit the Government to contract for any supply or service whatsoever. Further, the Air Force Research Laboratory Sensors Directorate (AFRL/RY) is not at this time seeking proposals and will not accept unsolicited proposals. Responders are advised that the U.S. Government will not pay for any information or administrative costs incurred in response to this RFI; all costs associated with responding to this RFI will be solely at the interested party’s expense. Not responding to this RFI does not preclude participation in any future RFP, if any is issued. If a solicitation is released, it will be synopsized on the Federal Business Opportunities (FedBizOpps) website. It is the responsibility of the potential offerors to monitor this site for additional information pertaining to this requirement.

Please note that subsequent to the due date of this RFI (16 Jun 2017) an Agile ISR Open House for interested Government, military, and DoD contractor personnel will be conducted on 13 July 2017 at Wright Patterson AFB, 5075 Skeel Ave, Area A, Hanger 268. RSVP to john.garcher.1.ctr@us.af.mil ((937) 713-4302) is required for attendance at the Agile ISR Open House. Particulars for the Open House are described in the attached tri-fold.

BACKGROUND

AFRL/RYZT Blue Guardian Program Description:

Blue Guardian is an AFRL led program designed to demonstrate advanced C4ISR capabilities in response to warfighter requirements in operationally relevant environments. A key component of Blue Guardian is utilization of a modular open system approach; and to provide feedback on how effective this approach is in reducing cost and schedule while meeting warfighter requirements. Blue Guardian has developed a platform architecture using the Air Force’s OMS (Open Mission Systems) reference architecture and conducted a ground and flight test program of multiple payload combinations. Systems tested included a vendor-unique variety of Full Motion Video (FMV) systems, a Wide Area Motion Imagery (WAMI) system, a multi-mode radar system, processing and database functions, multiple decompression algorithms, multiple communications systems, and a suite of software tools. Initial results of the Blue Guardian program show the promise of open architectures (OA) to DoD acquisitions, especially for Intelligence, Surveillance and Reconnaissance (ISR) payload applications. Specifically, the OMS reference architecture was extremely useful in reducing the cost and time required for integrating new systems. Blue Guardian is sponsored by AF/A2, and is partnering with the Air Force Life Cycle Management Center (AFLCMC), Air

The mission of Blue Guardian is to deliver ISR capabilities faster & cheaper, Blue Guardian accomplishes this by:

- Using the USAF OMS architecture
- Providing USAF owned hardware and software baselines
- Reducing re-work and integration time between programs
- Demonstrating operational relevance early through prototyping

The program is structured to provide a baseline research and development environment that is platform, sensor, and mission agnostic. As warfighter requirements are identified, the Blue Guardian program spins off companion projects to tailor capabilities to meet the target platform and mission needs. The first project, Project Shepherd successfully completed an early operational demonstration of OMS enabled C4ISR capabilities in the JIATF-S AOR. A follow-on Blue Guardian project, Project Harvest Reaper, is planning to flight test the prototype AgilePod™ ISR system on an MQ-9 Reaper platform in the fall of 2017.

AFRL/RYZT Blue Guardian System Architecture Overview:

The current Blue Guardian OMS architecture as shown below pulls together the OMS reference implementation, adapted sensors, and additional OMS enabled systems to support flight testing of capabilities in relevant operational demonstrations. The OMS reference implementation of the ASB (Avionics Service Bus) and CAL (Critical Abstraction Layer) support message exchanges via ActiveMQ (Java Message Service) publish/subscribe transport layer, based on topics. Commercially available Dell servers (processing and data storage) and laptops (analyst workstations) are connected via a 10 gigabit Ethernet backbone. Additionally, through flight testing, the team has further demonstrated a reduced size weight and power (SWaP) configuration consisting of a single Dell laptop running with a Virtual Machine (VM) server.
AFRL/RX AgilePod™ Overview:

Consistent with the Air Force’s vision of affordable and flexible ISR, AFRL’s Materials and Manufacturing Directorate, AFRL/RX, intent for the AgilePod™ effort was to research, develop, design, and build a prototype multi-intelligence (multi-int), reconfigurable pod demonstrating benefits of agile manufacturing and a modular open systems architecture (MOSA) to make podded ISR capabilities more affordable, operationally flexible and offer real solutions to close warfighting gaps. An important aspect of the open systems implementation within AgilePod™ is the adherence to the Society of Automotive Engineers (SAE) Electrical (AS6129) and Mechanical (AS6169) Interface Standards for Airborne EO/IR Turret Systems.

The AgilePod™ team applied a Digital Thread methodology during design, analysis, fabrication and build of AgilePod™. In particular, model based design, including computational fluid dynamics for aerodynamic load estimates and finite element modeling for structural analysis, facilitated engineering decisions during design iterations for the sensor elevators and pod structural components. Quick interaction between team members permitted by the use of communications and collaboration tools, and a Standard for The Exchange of Product (STEP) file exchange format even before the final Digital Thread implementation was completed. In particular, the SolidWorks Enterprise Product Data Management (EPDM) digital environment enabled rapid re-design of the sensor elevator mounts, which yielded manufacturing time and significant savings in manufacturing costs.

AgilePod™ System Description

Provided to the US Government with unlimited rights, the AgilePod™ design is a standards-based modular open systems pod that supports rapid multi-INT payload re-configurability, and multi-platform agility shown in the computer aided design (AD) model concept below.
The nearly square 30-inch by 30-inch cross-sectional pod size can scale in length from three to five compartments, or approximately 7 to 15 feet. There are two different size turret sensor compartments (33-inch and 28-inch) specifically designed to house sensors defined by the Class I and Class II (SAE AS6169) Mechanical Interface Standard for Airborne EO/IR Systems, respectively. In addition, there are two different size center compartments (60-inch and 45-inch) that can support a host of other sensor types and associated equipment, including Radar, electronic warfare (EW), signals intelligence (SIGINT), FMV, Communication Systems, Wide Area Motion Imagery (WAMI), Common Launch Tubes (CLTs) for Tactical Off-board Sensing UAVs, and various other equipment rack configurations.

Sensors and equipment configurations can be rapidly changed out to tailor payloads to specific mission criteria. Processing can be performed inside AgilePod™ compartments, or onboard the host aircraft. The center compartments support 14-inch and 30-inch Bomb Rack Unit (BRU) mounting to enable aircraft interface on several types of platforms. The initial pod configuration includes a Nosecone, Tailcone, and center compartments (45-inch and 60-inch) with RF transparent skins through X-band. Each compartment has mechanical interfaces and connectors defined by SAE AS6169 and AS6129, respectively. Sensor elevators are provided to deploy turreted sensors if needed for low ground clearance (but can be removed to reduce weight). In all, seven AgilePod™ compartments were produced: Nosecone, Tailcone, 60-inch Center Compartment, 45-inch Center Compartment, 33-inch Class I Turret Compartment, and two 28-inch Class II Turret Compartments. Additionally, a Power Distribution Unit (PDU), three sensor elevators (Class I and two Class II), equipment racks, sensor adapters and cables were produced.

**Planned Production:** TBD

**Delivery Period:** Prototype delivered December 2016.

**Limitations:** DISTRIBUTION D: Distribution authorized to Department of Defense and U.S. DoD contractors only (ADMINISTRATIVE or OPERATIONAL USE (4 APR 2012)). Refer requests to AFRL/RYZT.

**Security Requirements:** UNCLASSIFIED.
AFRL Information Available Upon Request: The following unclassified AFRL Open Mission Systems (OMS) data / documentation has been developed and/or demonstrated as part of the Blue Guardian program. Types of information that may be available for distribution upon request include:

- Vendor specific OMS sensor adapters
- Sensor emulators that respond to OMS command and control with appropriate status and test data
- Data management services (Sensor Processing Architecture for Data Exploitation or SPADE)
- Data visualization (AFRL “Pursuer” open source layered sensing platform)
- All the utilities included in the OMS starter kit (e.g. swim-lane)
- Separate air and ground OMS Avionics Service Bus (ASB) and Critical Abstraction Layer (CAL)
- Gateway service to bridge air and ground ASBs
- Support for multiple CALs ( Versions 1.1 and/or 1.2)
- OMS documentation package for pre-integration work
  - Platform description document (defines specific CAL, ASB, tier level, etc. for the AFRL Blue Guardian implementation)
  - Mission package (defines specific subsystems and services provided)
  - Service contracts for all sensors written to date
- SAE connector information for mechanical / electrical integration

Requested Information

Information Requested: The Government invites interested parties to submit (1) a White Paper with their technical approach to integrating a sensor with the AgilePod™, its open architecture features/capabilities including size, weight and power (SWaP), performance specifications and a discussion of physical and functional interface controls (3 page limit), and (2) a chart that identifies rough order of magnitude (RoM) cost, schedule and milestones broken out by FY18 and FY19 quarters (1 page limit).

White papers in Microsoft Word for Office compatible format are due no later than 16 June 2017, 1600 hours EST. Responses shall be limited to 3 pages (White Paper) and 1 page chart detailing RoM cost, schedule and major FY18 and FY19 milestones by quarter. Responses shall be submitted via e-mail to the POCs listed below. Proprietary information, if any, should be minimized and MUST BE CLEARLY MARKED. To aid the Government, please segregate proprietary information. Please be advised that all submissions become Government property and will not be returned. If any responder does not currently have a Proprietary Data Protection Agreement (PDPA) that would permit the AFRL/RYZ support contractor listed below to review and evaluate white papers submitted in response to this RFI, the responder is requested to sign PDPA with these AFRL/RYZ support contractors for this purpose. IF you have a classified response contact a POC below for transmittal instructions. The following is a list of Points of Contact who will also review the responses.

<table>
<thead>
<tr>
<th>Organization: AFRL/RYZT</th>
<th>Name: Russell Shirey, Capt, USAF</th>
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<tbody>
<tr>
<td>Telephone Number: 937-713-4308</td>
<td>E-mail Address: <a href="mailto:russell.shirey@us.af.mil">russell.shirey@us.af.mil</a></td>
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<tr>
<th>Organization: AFRL/RXME</th>
<th>Name: Mark DiPadua</th>
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<td>Telephone Number: 937-656-4271</td>
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<th>Company: MacAulay-Brown Inc.</th>
<th>Name: John Garcher</th>
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The white paper shall provide administrative information, and shall include the following as a minimum:

a. Name, mailing address, overnight delivery address (if different from mailing address), phone number, fax number, and e-mail of designated point of contact.

b. Recommended contracting strategy.

c. Either 1) copies of executed non-disclosure agreements (NDAs) with the contractors supporting AFRL and AFRL supported PEOs in technical evaluations or 2) a statement that the responder will not allow the Government to release its proprietary data to the Government support contractors. In the absence of either of the foregoing, the Government will assume that the responder does NOT agree to the release of its submission to Government support contractors.

d. Business type (large business, small business, small disadvantaged business, 8(a)-certified small disadvantaged business, HUBZone small business, woman-owned small business, very small business, veteran-owned small business, service-disabled veteran-owned small business) based upon North American Industry Classification System (NAICS) code 541512, Computer Systems Design Services. “Small business concern” means a concern, including its affiliates that are independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in 13 CFR part 121. A small business concern for the purposes of this procurement is generally defined as a business, including its affiliates, averaging no more than $15 million dollars in annual receipts. Annual receipts of a concern that has been in business for 3 or more complete fiscal years means the annual average gross revenue of the concern taken for the last 3 fiscal years. Annual receipts of a concern that has been in business for less than 3 complete fiscal years means its total receipts for the period it has been in business, divided by the number of weeks including fractions of a week that it has been in business, and multiplied by 52. Responders are cautioned, however, that this is a general description only. Additional standards and conditions apply. Please refer to Federal Acquisition Regulation FAR 19 for additional detailed information on Small Business Size Standards.

e. The facility security clearance of the responder.

Questions:
Questions regarding White Paper or RoM chart formats only shall be submitted in writing by e-mail to the POCs listed above. Verbal questions will NOT be accepted. Questions shall NOT contain proprietary or classified information. The Government does not guarantee that questions received after 30 June 2017, 1600 hours EST will be answered.

7.0 Summary

THIS IS A REQUEST FOR INFORMATION (RFI) ONLY to identify sources that can provide AgilePod™ compatible multi-intelligence sensor and processing payload candidates. The information provided in the RFI is subject to change and is not binding on the Government. The Air Force has not made a commitment to procure any of the items discussed, and release of this RFI should not be construed as such a commitment or as authorization to incur cost for which reimbursement would be required or sought. All submissions become Government property and will not be returned.