The Washington Headquarters Services, Acquisition Directorate on behalf of the Department of Defense releases the

FY 2016 Rapid Innovation Fund Broad Agency Announcement Announcement Number: HQ0034-16-BAA-RIF-0001

Issue Date: March 1, 2016

IMPORTANT

THIS IS A TWO-STEP SOLICITATION PROCESS:

- **STEP 1 – SUBMISSION OF WHITE PAPERS**
- **STEP 2 – SUBMISSION OF FULL PROPOSALS (BY INVITATION ONLY)**

White Paper Submission: DoD begins accepting White Papers ***March 15, 2016.***

Deadline for Receipt: White Papers must be **completely** submitted by *3:00 p.m. EDT* ***May 03, 2016***.

Classified White Papers are not accepted under the DoD RIF Program.

Please read the entire solicitation carefully prior to a response.

Help Desk: If you have questions about the Defense Department's RIF Program, please submit to questions@dodrif.com.

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Department of Defense Rapid Innovation Fund

EXECUTIVE SUMMARY

The goal of the Rapid Innovation Fund is to facilitate the rapid insertion of innovative technologies into military systems or programs that meet critical national security needs. The DoD seeks mature prototypes for final development, testing, evaluation, and integration. Those selected for award may receive up to $3 million in Rapid Innovation Funding and will have up to two years to perform the work. There is a source selection preference for technologies from small businesses. There are two phases in the source selection process: White paper submission and full proposal submission. Full proposal submissions are by invitation only. DoD funds available for award are approximately $250 million.

1.0 General Information

1.1 Introduction

This Broad Agency Announcement (BAA) with procurement instrument identification number HQ0034-16-BAA-RIF-0001 constitutes the solicitation of offers for research and development for the Rapid Innovation Fund. The Rapid Innovation Program was enacted by Congress in section 1073 of the National Defense Authorization Act of Fiscal Year (FY) 2011 and re-authorized in section 216 of the National Defense Authorization Act for FY 2016 to facilitate rapid insertion of innovative technologies into military systems or programs that meet critical national security needs.

The goals of the RIF Program reflect DoD's emphasis on rapid, responsive acquisition and the engagement of small, innovative businesses in solving defense needs. The BAA is for the validation and transition of innovative technologies developed predominantly by small businesses, to include those from Small Business Innovation Research (SBIR) and DoD reimbursed Independent Research and Development (IR&D). IR&D does not include R&D performed under a grant or contract from the Government. IR&D is defined in Federal Acquisition Regulation (FAR) 31.205-18(a). SBIR and IR&D are examples of technology development efforts that may potentially qualify for RIF.

Offers submitted in response to this BAA should resolve operational challenges or other critical national security needs as characterized by the Department of Defense Components' requirements. The DoD Components participating in the RIF Broad Agency Announcement (BAA) may include, but is not limited to the Military Services e.g. Department of Army, Department of the Navy, Department of the Air Force, and Defense Agencies, including: Chief Information Officer / Defense Information Systems Agency (CIO / DISA); Combating Terrorism Technical Support Office (CTTSO); Defense Logistics Agency (DLA); Defense Threat Reduction Agency (DTRA); Joint Improvised-Threat Defeat Agency (JIDA); Joint Science and Technology Office for Chemical and Biological Defense (JSTO-CBD); Missile Defense Agency (MDA); National Reconnaissance Office (NRO); North American Aerospace Defense Command /

United States Northern Command (NORAD / USNORTHCOM); Office of the Assistant Secretary of Defense for Research and Engineering (R&E); United States Africa Command (AFRICOM), United States Pacific Command (USPACOM); United States Southern Command (SOUTHCOM); United States Special Operations Command (USSOCOM); and United States Transportation Command (USTRANSCOM). These organizations are herein referred to as the DoD Components.

1.2 Soliciting Agency

On behalf of the Office of the Secretary of Defense, the soliciting contracting office is: Washington Headquarters Services (WHS) Acquisition Directorate (AD), 1155 Defense Pentagon, Washington, DC 20301-1155

Primary Contracting Officer, WHS-AD: Jim Colachis, Email: james.l.colachis.civ@mail.mil
Alternate Contracting Office, WHS-AD: Khalil Mack, Email: khalil.r.mack.civ@mail.mil

1.3 Key Dates

Event	Date	Time
BAA is Released on Federal Business Opportunities (FEDBIZOPPS)	**March 1, 2016**	**N/A**
Websites Open for White Paper Submission	**March 15, 2016**	**N/A**
Amendment with Relevant Questions and Answers Posted on FEDBIZOPPS	**April 15, 2016**	**NA**
BAA Closes for White Paper submissions	**May 3, 2016**	**3:00 p.m. EDT**

2.0 Eligible Sources

2.1 Industry and Academia

All responsible firms and academic institutions capable of satisfying the Government's needs may submit a White Paper under this BAA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit White Papers and/or participate in teaming arrangements in submitting White Papers; however, no portion of this announcement will be set aside for HBCU and MI participation.

2.2 Foreign Participants

Foreign participants and/or individuals may participate to the extent that such participants comply with any necessary Non-Disclosure Agreements, Security Regulations, and any other applicable statutes. Some requirements may cover export-controlled technologies. Research in these areas is limited to "U.S. persons" as defined in the International Traffic in Arms Regulations (ITAR), 22 CFR §1201.1.

2.3 Federally Funded Research & Development Centers (FFRDCs)

Federally Funded Research & Development Centers (FFRDCs), including Department of Energy National Laboratories, are not eligible to receive awards under this BAA. However, participation in teaming arrangements with other eligible participants is allowed to the extent that such an arrangement is permitted under the sponsoring agreement between the Government and the FFRDC.

2.4 Department of Defense Laboratories

Department of Defense laboratories are not eligible to receive awards under this BAA and should not submit White Papers in response to this BAA. As with FFRDCs, these organizations may participate in teaming arrangements with eligible sources from academia and industry that are submitting offers in response to this BAA.

2.5 University Affiliated Research Centers (UARCs)

University Affiliated Research Centers are eligible to submit proposals under this BAA unless precluded from doing so by their Department of Defense UARC contracts.

2.6 Teaming

Teams are also encouraged and may submit proposals in any and all areas. However, offerors must be willing to cooperate and exchange software, data and other information in an integrated program with other contractors.

3.0 North American Industry Classification System (NAICS) Code

The NAICS codes for this announcement are 541712: Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology), and 541711: Research and Development in Biotechnology. A small business under these NAICS codes is defined by a size standard of 500 employees. Submitters are only required to have one of the above NAICS codes in order to submit.

4.0 System for Award Management (SAM)

All offerors submitting White Papers must have an active registration in SAM at https://www.sam.gov/portal/public/SAM prior to the BAA close date. Failure to indicate

whether your entity is a small business for the NAICS codes listed in Section 3.0 in www.SAM.gov prior to the BAA close date may result in your White Paper not being considered.

5.0 Award Instrument Types

The type of contract selected by the Government will be either a firm fixed price contract, or a cost reimbursement type contract, in accordance with FAR Part 16, Contract Types. If exceptional circumstances exist, a Cooperative Agreement or Other Transaction may be considered. If a cooperative agreement is selected, the award will be in accordance with DoD Regulation 3210.6-R, Department of Defense Grant and Agreement Regulations. Other Transaction authority will be in accordance with 10 U.S.C 2371. Awards may be made consistent with 10 U.S.C. 2358, 10 U.S.C. 2361, and 10 U.S.C. 2374(a). Contract type and funding arrangements are at the discretion of the Government.

6.0 Communications with Offerors

6.1 Solicitation Amendements

Amendments or links to amendments will be posted to FEDBIZOPPS https://www.fbo.gov. Although other web pages may repost these amendments, offerors are advised that the FEDBIZOPPS web page is the only official record.

6.1 General RIF Inquiries

Offerors may submit formal written general questions to questions@dodrif.com, Subject: FY2016 RIF General Question (not addressing a requirement). The questioner and respondent shall remain anonymous. All relevant and/or BAA clarification question(s) will be posted as an amendment to this solicitation on FEDBIZOPPS not later than April 15, 2016. Offerors are advised to monitor FEDBIZOPPS during the solicitation period for amendments to the solicitation.

6.2 DoD Component Inquiries

Non-technical questions pertaining to a particular DoD Component should be submitted in accordance with the instructions given in the Component's Annex in Section 13.0 of this solicitation.

During the open BAA period offerors may also submit technical questions directly to the Technical Point of Contact (TPOC) for the DoD Component identified in the Component's Annex in Section 13.0 of this solicitation. Questions may be addressed to either the telephone contact or email. For emails, place the following in the subject line: FY2016 RIF Question for *[Insert DoD Component / Requirement #]*. Offerors have an opportunity to ask ***technical questions*** only about specific requirements. Questions should be limited to specific information related to improving the understanding of a

particular requirement. **Offerors may not ask for advice or guidance on solution approach and may not submit any material to the technical POC**.

6.3 Notifications

White Papers

All offerors submitting a White Paper in response to this BAA will receive an email message. The e-mail will either inform the offeror that its White Paper was selected for invitation to submit a Full Proposal or its White Paper was not selected for an invitation.

Full Proposals

Offerors invited to submit Full Proposals will receive an email or other written notification from the DoD Component cognizant contracting officer providing instructions for the submission of a full proposal. Similarly, offerors that submit a full proposal will receive an email or other written notification if their proposal has been selected for award.

Note: Notification of White Paper and proposal selection is not an authorization to begin work.

6.4 Debriefings

White Paper evaluation will not entitle the offeror to a debrief as no award can result from a White Paper. However, for Full Proposals, the Component contracting officer shall follow the procedures in FAR 15.5.

7.0 Program Funding

Those selected for award may receive up to $3M in RIF Program funding. White Papers or Full Proposals submitted for greater than $3M may be eliminated from further consideration. Awards for greater than $3M require OSD AT&L waiver and congressional notification.

$250M was appropriated to OSD in FY16 and will be allocated to fund requirements of Defense Components, as follows:

- For support of Army, DoN and Air Force RIF project requirements: $50M each or $150M total.
- For Defense Agencies RIF project requirements: $50M.
- The remaining $50M will support defense-wide technology area priorities.

- This funding is an estimate only and not a contractual obligation, as all funding is subject to change.

8.0 Period of Performance

The performance period shall not exceed 24 months from date of contract award.

9.0 Two-Step Solicitation Process

9.1 General Information

No paper copies of this solicitation will be issued. The government reserves the right to fund all, some or none of the proposals in response to this announcement and to create and maintain a reserve list of proposals for potential funding, in the event that sufficient funding becomes available. No funding will be provided to offerors for reimbursement of costs incurred to respond to this solicitation. White Papers, technical and cost or price proposals (or any other material) submitted in response to this BAA will not be returned. All submissions will be treated as sensitive competitive information and their contents will be disclosed only for the purposes of evaluation.

9.2 E-mail Addresses

Offerors must be aware that it is their responsibility to ensure: (1) correct e-mail addresses are provided at the time of submission, (2) e-mail notifications reach the intended recipient(s), and (3) the e-mail is not blocked by the use of 'spam blocker' software or other means that the recipient's Internet Service Provider may have implemented as a means to block the receipt of certain e-mail messages.

9.3 Reserved

9.4 Electronic Submissions

Offerors must register and submit White Papers to the following DoD RIF websites:

- RIF Main Page (contains below links) - http://www.dodrif.com
- Army - http://www.dodrif.com/user/login
- DoN - https://www.navysbirprogram.com/NavyRIF
- Air Force - http://www.AFRapidInnovationFund.com
- Office of the Secretary of Defense (OSD) Defense Agencies - http://www.dodrif.com/user/login

White Papers provided by any other means (e.g. hand-carried, postal service mail,

commercial carrier, fax or e-mail) will not be considered.

White Papers will be considered **"works in progress"** until the offeror submits electronically all three sections in accordance with section 9.5. The respective DoD RIF submission website will provide offerors a printable confirmation of successful White Paper submission upon completion. **White Papers remaining in the system after the due date that have not been finalized will not be evaluated.**

9.5 Step 1: Submission of White Papers

White Papers shall address one of the requirements listed in Section 13.0 of this announcement. Only UNCLASSIFIED White Papers will be accepted. White Papers should focus on one requirement per paper. There is no limit on the number of White Papers an offeror may submit in response to this BAA.

White Papers must be received through the appropriate DoD RIF submission website NLT 3:00 p.m. EDT, May 3, 2016. All White Paper submissions must comply with the submission guidelines/templates provided on the respective websites. Failure to comply may result in the rejection of the White Paper during the review. Offerors are responsible for accessing the appropriate DoD RIF submission website and for submitting electronic White Papers to the website specified in Section 9.4. When sending electronic files, the offeror shall account for potential delays in file transfer from the originator's computer server to the DoD RIF submission website. Offerors are encouraged to submit their responses early to avoid potential file transfer delays due to high demand or problems encountered in the course of the submission.

Acceptable evidence to establish the time of receipt includes electronic evidence of receipt. Offerors should print and maintain for their records the electronic date/time stamped receipt appearing on the final screen following each submission. All submissions shall be fully uploaded and submitted before the due date and time in order to be considered submitted timely. **There will be no exceptions**.

Any modification or revision to the White Paper received at the respective DoD RIF submission website after the exact time specified for receipt of offers is "late" and will not be considered.

9.5.1 White Paper Structure

A complete White Paper will consist of three sections: Section One, the Cover Sheet, Section Two, the Technical Description (to include cost), and Section Three, the Quad Chart.

Number of Pages: The White Paper submission is limited to four pages, which includes Sections Two (Technical Description) and Three (Quad Chart) (discussed below). Section One (Cover Sheet) does NOT count towards the page count. Pages submitted in excess of the stated limits will not be read or evaluated.

Section One – Cover Sheet (Online Form)

The Cover Sheet is prepared on a DoD RIF submission website. The Cover Sheet must be prepared before Sections Two and Three can be submitted. Offerors that intend to submit multiple White Papers must prepare a separate cover sheet for each White Paper. Upon completion of the Cover Sheet, the offeror will be instructed to submit the Technical Description and Quad Chart. Offerors are responsible for ensuring that all sections have been submitted and accepted by the website. **Detailed submission instructions are available on each Component's website. Cover Sheet data elements required vary by Component.**

Section Two – Technical Description (TD)

The TD shall be prepared outside of the respective DoD RIF submission website and then uploaded to the submission site as a PDF attachment. Ensure your TD adequately describes the proposed approach and resulting contributions. The TD shall include the following sections in the order given below, as applicable:

1. **Contribution to the Requirement:** Provide a high-level project overview describing how (3-5 sentence description) this contribution addresses one or more of the goals listed below:

    - **Enhanced Military or DoD System Capability** – Describe how your proposed project significantly increases or improves the military capabilities in relationship to requirements identified in Section 13 and/or acquisition program needs.

    - **Accelerated Military or DoD System Development Capability** – Describe how your proposed project accelerates the development and ability to deploy military or system capabilities required for use by the Department of the Defense.

    - **Reduces Costs** – Describe how your proposed project reduces the development, acquisition, sustainment, demilitarization, or total ownership costs of the identified fielded system or acquisition program.

    - **Reduce Technical Risks** – Describe how your proposed approach can reduce the probability of program failure.

    - **Improve the timeliness and thoroughness of test and evaluation outcomes** – Describe how your innovative technology contributes to improving testing timelines/results.

2. **Technical Approach:** Describe how the proposed technical approach is innovative, feasible, achievable, complete, and supported by a technical team that has the

expertise and experience to accomplish the proposed tasks, including:

- Project objectives and scope.
- Overview of tasks and methods planned to achieve each objective.
- The final product to be delivered.
- Key Personnel (including subcontractors and consultants).
- Facilities/Equipment necessary to carry out the proposed effort.
- Related Prior or Current Work, including SBIR/STTR contracts and IR&D projects.
- The current Technology Readiness Level (TRL) of the technology and/or product and what you think is required in testing by the government in order for your technology or product to be incorporated into a defense system or military program. DoD seeks a Technology Readiness Level (TRL) goal of 5 - 6 for entry and goal of 7 - 9 for exit (for descriptions of TRL, see www.acq.osd.mil/chieftechnologist/publications/docs/TRA2011.pdf.) In circumstances of exceptional technical merit, proposals with a lower TRL rating will be considered for award, as warranted by the Source Selection Authority.
- Discuss the benefits of your product or technology as it applies to the requirement addressed and how you plan to transition deliverables to a Government acquisition program, including any restrictions on Government use, release, or disclosure of technical data or computer software presenting transition difficulty and/or increased risk/cost to the Government.

3. **Schedule:** Provide a proposed project schedule and describe how the proposed schedule is achievable for the proposed technical approach. Technologies should transition to a military system or defense program within 24 months of contract award. Discuss and/or use a Gantt Chart or similar master planning tool to describe:
   - Major activities/milestones to include transition and/or deployment events
   - Deliverables
   - Metrics/measures of success
   - Potential risks and risk mitigation plans

4. **Costs:** Name and describe the estimated costs for the proposed technical approach, including:

   - The methods (e.g., expert judgment, analogous estimating, parametric estimating) used to ensure that the proposed costs are realistic for the technical approach proposed

   - Additional funds, if any, expected to complete the project including the timing, source, amount, and planned use of the funds. Describe funding dependencies, if any or known, such as a firm commitment from a government organization,

and/or Internal Research and Development, which may be critical to the completion of a task.

Text & Font Format: Text shall be at least single-spaced, on 8½ x 11 inch paper, with a minimum of one-inch margin all around. Pages shall be numbered consecutively. Font size shall be of minimum 10-point font and preferably Times New Roman. Bolding, underlining, and italics may be used to identify points of emphasis. Graphic presentations, including tables, while not subject to the same font size and spacing requirements, shall have spacing and text that is easily readable.

Headers: The offeror's name and applicable requirement number shall be in the header of each page. The header may be included in the one-inch margins.

Section Three – Quad Chart

The unclassified Quad Chart shall be prepared outside of the respective DoD RIF submission website in Landscape orientation and then uploaded to the submission site as an editable PowerPoint attachment**. A Quad Chart template can be found at the Federal Business Opportunity website, FY2016 DoD Rapid Innovation Fund (RIF) Broad Agency Announcement, on the right hand side column, titled "Appendix 1 - Quad Chart Format".** The Quad Chart should be formatted as stated and include the following information:

- **Heading** (Arial 24pt Bold)
  - Title of Project
  - Company
  - Requirement number (#)

- **Upper Left Quadrant:**
  - Picture or graphic illustrating proposed technology development

- **Lower Left Quadrant** (Arial 12pt Normal):
  - Project objectives and scope
  - Key personnel, facilities/equipment
  - Related prior or current work

- **Upper Right Quadrant** (Arial 12pt Normal):
  - How the technology contributes and addresses the requirement
  - How the technology will transition to existing military systems or programs
  - Technical Readiness Level (current level and anticipated level at project completion)

- **Lower Right Quadrant**: (Arial 12pt Normal):
  - Estimated costs
  - Major activities/milestones to include transition and/or deployment events

- Deliverables, metrics/measures of success
- Potential risks

The Government's decision to invite an offeror to submit a Full Proposal will be based upon the evaluation results of the White Paper submission. If an offeror does not submit a White Paper by the specified due date and time, it is not eligible to participate in Step 2 of the solicitation process.

Virus Check: Perform a virus check before uploading the White Paper. If a virus is detected, it may cause rejection of the file.

Security: Do not lock or encrypt any files uploaded as part of your White Paper submission.

9.6 Step 2: Submission of Full Proposals

Full Proposals are by invitation only. The Government will extend invitations for submission of Full Proposals for those White Paper submissions that merit further consideration. Full Proposals shall expand on the White Paper submission providing sufficient detail that represents an innovative approach to accelerating the transition of defense-related technologies. Invitations for Full Proposals will be sent from respective DoD Component contracting officers to offerors. The anticipated due date and time for Full Proposals will be included in the proposal invitation.

Offerors are advised only properly warranted Government contracting officers are legally authorized to contractually bind or otherwise commit the Government. The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. Offerors may be removed from award consideration should the parties fail to reach agreement on award terms, conditions and cost/price within a reasonable time, or if the offeror fails to timely provide requested additional information.

9.6.1 Format of Full Proposals

Specific DoD Component information for Full Proposal preparation instructions will be provided with the invitation for Full Proposals. Do not lock or encrypt any files submitted as part of the proposal submission. Perform a virus check before uploading any files to the submission websites. If a virus is detected, it may cause rejection of the file. Proposal prices and terms and conditions shall remain valid for 180 days from the submission date of the Full Proposal.

10.0 White Paper and Full Proposal Evaluations

The evaluation process will be conducted using technical subject matter expert reviews as described in FAR 6.102(d)(2) and 35.016. Each White Paper will be evaluated based on the merit and relevance of the specific White Paper as it relates to the evaluation factors

stated herein rather than against other White Papers for requirements in the same general area. Each Full Proposal will be evaluated based on the merit, relevance and cost of the specific proposal as it relates to the evaluation factors stated herein rather than against other proposals for requirements in the same general area.

10.1 Evaluation Factors

White Papers and Full proposals will be evaluated using adjectival ratings applied to each of the non-price factors:

- **Factor #1 – Contribution to the Requirement:** The degree to which the technical approach is relevant to the proposed requirement.

- **Factor #2 – Technical Approach/Qualifications:** The degree to which the technical approach is innovative, feasible, achievable, complete and supported by a technical team that has the expertise and experience to accomplish the proposed tasks. This includes an evaluation of the probability for transition of this effort into an acquisition program, a military system, or other military capability.

- **Factor #3 – Schedule:** The degree to which the proposed schedule is achievable within 24 months from award.

- **Factor #4 – Cost:** Whether the proposed cost or price is realistic for the proposed technical approach and does not exceed $3 million.

During evaluations, Factors #1 and #2 are equally important; Factors #3 and #4 are equally important. When considered together Factors #1 and #2 are significantly more important than Factors #3 and #4.

10.2 Adjectival Ratings

During the evaluation of White Papers and Full Proposals, the following adjectival ratings will be used for each of the non-price factors. White Papers will receive a “Go” or “No Go” determination as to whether it will receive further consideration. If during any evaluation a factor is deemed “Marginal” or “Unacceptable” that evaluation will automatically receive a “No Go” determination and will not receive further consideration.

- **Outstanding (O) –** The White Paper/Full Proposal meets requirements and indicates an exceptional approach and understanding of the requirements. Strengths far outweigh any weaknesses. The risk of unsuccessful performance is very low.

- **Good (G) –** The White Paper/Full Proposal meets requirements and indicates a thorough approach and understanding of the requirements. Strengths outweigh any weaknesses. The risk of unsuccessful performance is low.

- **Acceptable (A) –** The White Paper/Full Proposal meets requirements and indicates an adequate approach and understanding of the requirements. Strengths and weaknesses are offsetting or will have little or no impact on contract performance. The risk of unsuccessful performance is no worse than moderate.

- **Marginal (M) –** The White Paper/Full Proposal does not clearly meet requirements and has not demonstrated an adequate approach and understanding of the requirements. One or more weaknesses are not offset by strengths. The risk of unsuccessful performance is high.

- **Unacceptable (U) –** The White Paper/Full Proposal does not meet requirements and contains one or more deficiencies. The proposal is not awardable.

11.0 Award Information

11.1 Commitment to Small Business

It is the policy of the Department of Defense to provide maximum opportunity to small businesses, including small businesses in all socioeconomic categories to participate in DOD acquisitions. DoD is strongly committed to providing prime and subcontracting opportunities for small businesses, including small businesses in all socioeconomic categories, and, Historically Black Colleges and Universities, and Minority Institutions to support the RIF program.

Selection preference shall be given to small business offers addressing the above evaluation factors. If a small business (prime) proposer is teaming with an other than small business on the project, the small business must perform at least 51 percent of the cost of the work.

Awards to other than small business offerors are allowed but ONLY after the approval authority determines the offer is superior to an offer received from a small business. Offers from an other than small business proposer must demonstrate how it intends to provide meaningful small business participation opportunities to support its proposed project (see Section 11.5).

11.2 Basis of Award

The Government intends to make multiple awards resulting from this announcement and reserves the right to select for award any, all, part, or none of the proposals received. The awards will be made based on the best proposals that are determined to be most beneficial to the Government with appropriate consideration given to the evaluation factors, order of importance, and selection preferences. Awards will be made to the offerors whose offer is determined to provide the “best value” to the Government based on the factors/preferences, this may not necessarily be the proposal offering the lowest cost/price or receiving the highest evaluated rating.

11.3 Negotiation and Discussions

Each Component will determine if negotiations or discussions are required.

11.4 DCAA-Approved Accounting System

Offerors selected for a cost-type award must have a Defense Contract Audit Agency (DCAA)-approved accounting system. Guidance is available at http://www.dcaa.mil. Offerors are encouraged to obtain DCAA accounting system approval prior to the award timeframe. Lack of a DCAA approved accounting system will delay and possibly prevent a cost-type or any other award. Questions may be addressed to the Component Point of Contact listed in Section 13.0. While a DCAA audit is pending, a Component contracting officers may make a determination that the offeror's accounting system is acceptable in accordance with FAR 242.7502 and the clause at FAR 252.242-7006, Accounting System Administration.

11.5 Subcontracting Plans

For offers proposed in excess of $700,000 by other than small businesses, the offeror is required to submit a Subcontracting Plan in accordance with FAR 52.219-9. As such, subcontracting plans will be reviewed (and negotiated as necessary) to ensure subcontracting plans are compliant with FAR Subpart 19.7.

11.6 Contract Options

RIF statute encourages the Department use mechanisms to facilitate transition of technology into acquisition programs. Under FAR 52.217-7, 52.217-8, and 52.217.9, contracting offices may include options in RIF contracts for further testing, low rate production, or full rate production of technologies developed under the RIF program. These options can be executed by the cognizant contracting activity beyond the performance period for the RIF deliverables, e.g., beyond the 24-month performance for the baseline RIF contract.

12.0 Other Information

The cost of preparing submissions in response to this solicitation is not considered an allowable direct charge to any resulting or any other contract. However, it may be an allowable expense to a normal Bid and Proposal indirect cost as specified in FAR 31.205-18.

12.1 Provisions and Clauses

This BAA lists some provisions and clauses that may be required to be incorporated in resulting contracts. Similar provisions may be included in the terms and conditions of resulting Cooperative Agreements and Other Transactions. Component contracting officers are required to insert applicable provisions and clauses in their invitations for

Full Proposals.

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (Feb 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the contracting officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at http://farsite.hill.af.mil. **Note: These provisions do not apply to White Paper submissions, but may be incorporated by the Component contracting offices if proposers are invited or requested to submit proposals.**

52.204-10 – Reporting Executive Compensation and First-Tier Subcontract Awards (Jul 2013)

252.211-7003 – Item Identification and Valuation (Aug 2008)

52.215-22 – Limitations on Pass-Through Charges—Identification of Subcontract Effort (Oct 2009)

52.215-23 – Limitations on Pass-Through Charges (Oct 2009) (ALT I)

52.217-7 – Option for Increased Quantity -- Separately Priced Line Item (Mar 1989)

52.217-8 – Option to Extend Services (Nov 1999)

52.217-9 – Option to Extend the Term of the Contract (Mar 2000)

52.219-28 – Post-Award Small Business Program Rerepresentation (Apr 2012)

52.222-54 – Employment Eligibility Verification (Aug 2013) (This clause will not be include in Cooperative Agreements or Other Transactions)

252.227-7013 – Rights in Technical Data--Noncommercial (Feb 2014)

252.227-7014 – Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation (Feb 2014)

252.227-7015 – Technical Data—Commercial Items (Feb 2014)

252.227-7017 – Identification and Assertion of Use, Release, or Disclosure Restrictions (Jan 2011)

252.227-7037 – Validation of Restrictive Markings on Technical Data (Jun 2013)

252.232-7003 – Electronic Submission of Payment Requests and Receiving Reports (Jun 2012)

252.235-7002 – Animal Welfare

252.235-7004 – Protection of Human Subjects (Jul 2009)

12.2 BAA-100 Organizational Conflicts of Interest (OCI)

Purpose

The primary purpose of this provision is to aid in ensuring that: the Contractor's objectivity and judgment are not biased because of its present, or currently planned interests (financial, contractual, organizational, or otherwise) which relate to work under a contract; the Contractor does not obtain an unfair competitive advantage by virtue of its access to non-public Government information regarding the Government's program plans and actual or anticipated resources; and the Contractor does not obtain any unfair competitive advantage by virtue of its access to proprietary information belonging to others.

Scope

The restrictions described herein shall apply to performance or participation by the Contractor and any of its affiliates or their successors in interest (hereinafter collectively referred to as "Contractor") in the activities covered by this clause as prime contractor, subcontractor, co-sponsor, joint venture, consultant, or in any similar capacity. The term "proprietary information" for the purposes of this clause is any information considered to be so valuable by its owner that it is held in secret by them and their licensees. Information furnished voluntarily by the owner without limitations on its use, or which is available without restrictions from other sources, is not considered proprietary.

Access To and Use of Government Information: If the Contractor, in the performance of this contract, obtains access to information such as plans, policies, reports, studies, financial plans, or data which has not been released or otherwise made available to the public, the Contractor agrees that without prior written approval of the contracting officer, it shall not: (a) use such information for any private purpose unless the information has been lawfully released or otherwise made available to the public, (b) compete for work based on such information after the completion of this contract, (c) submit an unsolicited proposal to the Government which is based on such information after such information is released, or (d) release such information unless such information has previously been lawfully released or otherwise made available to the public by the Government.

Access To and Protection of Propriety Information: The Contractor agrees that, to the extent it receives or is given access to proprietary data, trade secrets, or other confidential or privileged technical, business, or financial information (hereinafter referred to as "proprietary data") under this contract, it shall treat such information in accordance with any restrictions imposed on such information. The Contractor further agrees to enter into a written agreement for the protection of the proprietary data of others and to exercise diligent effort to protect such proprietary data from unauthorized use or disclosure. In addition, the Contractor shall obtain from each employee who has access to proprietary data under this contract, a written agreement which shall in substance provide that such employee shall not, during his/her employment by the Contractor or thereafter, disclose to others or use for their benefit, proprietary data received in connection with the work under this contract. The Contractor will educate its employees regarding the philosophy of Part 9.505-4 of the Federal Acquisition Regulation so that they will not use or disclose proprietary information or data generated or acquired in the performance of this contract except as provided herein.

Subcontracts: The Contractor shall include this or substantially the same clause, including this paragraph, in consulting agreements and subcontracts of all tiers. The terms "Contract", "Contractor", and "Contracting Officer", will be appropriately modified to preserve the Government's rights.

Disclosures: If the Contractor discovers an organizational conflict of interest or potential conflict of interest after award, a prompt and full disclosure shall be made in writing to the contracting officer. This disclosure shall be made on the OCI Analysis/ Disclosure Form provided as an Attachment to this contract, and shall include a description of the action the Contractor has taken or proposes to take in order to avoid or mitigate such conflicts.

Remedies and Waiver: For breach of any of the above restrictions or for non-disclosure or misrepresentation of any relevant facts required to be disclosed concerning this contract, the Government may terminate this contract for default, disqualify the Contractor for subsequent related contractual efforts, and pursue such other remedies as may be permitted by law or the contract. If, however, in compliance with this clause, the Contractor discovers and promptly reports an organizational conflict of interest (or the potential thereof) subsequent to contract award, the contracting officer may terminate this contract for the convenience of the Government if such termination is deemed to be in the best interest of the Government.

Modifications: Prior to contract modification, when the Scope of Work is changed to add new work or the period of performance is significantly increased, the contracting officer may require the Contractor to submit either an organizational conflict of interest disclosure or an update of the previously submitted disclosure or representation.

12.3 BAA-200 Export Control

The International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, will apply to all projects with military or dual-use applications that develop beyond fundamental research, which is basic and applied research ordinarily published and shared broadly within the scientific community. More information is available at http://www.pmddtc.state.gov/regulations_laws/itar.html.

12.4 Publication Approval

Government review and approval will be required prior to any dissemination or publication, except within and between the Contractor and any subcontractors, of classified and non-fundamental information developed under this contract or contained in the reports to be furnished pursuant to a contract.

12.5 Essentially Equivalent Work

While it is permissible, to submit proposals containing a significant amount of essentially equivalent work for consideration under numerous federal program announcements, it is unlawful to enter into awards requiring essentially equivalent effort. If there is any question concerning this, it must be disclosed to the soliciting agency or agencies before award.

Essentially equivalent work is defined as (1) substantially the same research is proposed for funding in more than one contract proposal or grant application submitted to the same Federal agency; (2) substantially the same research is submitted to two or more different Federal agencies for review and funding consideration; or (3) a specific research objective and the research design for accomplishing an objective are the same or closely related in two or more proposals or awards, regardless of the funding source.

12.6 Security Classification

In order to facilitate intra-program collaboration and technology transfer, the Government will attempt to enable technology developers to work at the unclassified level to the maximum extent possible. If access to classified material will be required at any point during performance, the offeror must clearly identify such need to the contracting office extending the invitation for full proposal.

12.7 Recombinant DNA

All research involving recombinant DNA must include documentation of compliance with Department of Human and Health Services (DHHS) recombinant DNA regulations, and shall comply with the applicable federal and state law, regulation and any additional agency guidance. Research must be approved by an Institutional Biosafety Committee (IBC).

12.8 Department of Defense High Performance Computing Program

The DoD High Performance Computing Program (HPCMP) furnishes the DoD S&T and DT&E communities with use-access to very powerful high performance computing systems. Awardees may be eligible to use HPCMP assets in support of their funded activities if Program Office approval is obtained and if security/screening requirements are favorably completed. Additional information and an application may be found at http://www.hpcmo.hpc.mil/.

12.9 Limitations on Other Transactions

Offerors are advised that an Other Transaction (OT) for Prototype Agreement (P.L. Law 103-160 § 845) may only be awarded if there is:

- At least one nontraditional defense contractor participating to a significant extent in the prototype project, or
- No nontraditional defense contractor is participating to a significant extent in the prototype project, but at least one of the following circumstances exists:
    - At least one third of the total cost of the prototype project is to be paid out of funds provided by the parties to the transaction other than the federal government. The cost share should generally consist of labor, materials, equipment, and facilities costs (including allocable indirect costs).
    - Exceptional circumstances justify the use of a transaction that provides for innovative business arrangements or structures that would not be feasible or appropriate under a procurement contract.
- Although use of one of these options is required to use an Other Transaction for Prototype agreement as the procurement vehicle, no single option is encouraged or desired over the others.

For purposes of determining whether or not a participant may be classified as a nontraditional defense contractor and whether or not such participation is determined to be participating to a significant extent in the prototype project, the following definitions are applicable:

"Nontraditional defense contractor" means a business unit that has not, for a period of at least one year prior to the date of the OT agreement, entered into or performed on:

- any contract that is subject to full coverage under the cost accounting standards prescribed pursuant to section 26 of the Office of Federal Procurement Policy Act (41 U.S.C. 422) and the regulations implementing such section; or
- any other contract in excess of $500,000 to carry out prototype projects or to perform applied research or advanced development projects for a Federal agency that is subject to the Federal Acquisition Regulation.

"Participating to a significant extent in the prototype project" means that the nontraditional defense contractor is supplying a new key technology or product, is accomplishing a significant amount of the effort wherein the role played is more

than a nominal or token role in the research effort, or in some other way plays a significant part in causing a material reduction in the cost or schedule of the effort or an increase in performance of the prototype in question.

Offerors are cautioned that if they are classified as a traditional defense contractor, and propose the use of an OT, the Government will require submittal of both a cost proposal under the guidelines of the FAR/DFARS, and a cost proposal under the proposed OT, so that an evaluation may be made with respect to the cost tradeoffs applicable under both situations. The Government reserves the right to negotiate either a FAR based procurement contract, or Other Transaction as it deems is warranted under the circumstances.

12.10 Technical and Administrative Support by Non-Government Personnel

The DoD may use non-government personnel (e.g. contractor support personnel) in the review and administration of offers submitted in response to this BAA. Support contractor employees may have access to offers including information that may be considered proprietary. All contractor support personnel having access to any proprietary data are required to execute nondisclosure agreements certifying that they will not disclose any information pertaining to this solicitation including any offers, the identity of any offerors, or any other information relative to this BAA. The contracts for provision of support personnel contain Organizational Conflict of Interest clauses and include contractual requirements for non-disclosure of proprietary contractor information.

12.11 Foreign Participants

Means any person who is NOT:

- a citizen or national of the United States; or
- a lawful permanent resident; or
- a protected individual as defined by 8 U.S.C. § 1324b(a)(3).

"Lawful permanent resident" is a person having the status of having been lawfully accorded the privilege of residing permanently in the United States as an immigrant in accordance with the immigration laws and such status not having changed.

"Protected individual" is an alien who is lawfully admitted for permanent residence, is granted the status of an alien lawfully admitted for temporary residence under 8 U.S.C.§ 1160(a) or 8 U.S.C. § 1255a(a)(1), is admitted as a refugee under 8 U.S.C. § 1157, or is granted asylum under Section 8 U.S.C. § 1158; but does not include (i) an alien who fails to apply for naturalization within six months of the date the alien first becomes eligible (by virtue of period of lawful permanent residence) to apply for naturalization or, if later, within six months after November 6, 1986, and (ii) an alien who has applied on a timely basis, but has not been naturalized as a citizen within 2 years after the date of the application, unless the alien can establish that the alien is actively pursuing naturalization, except that time consumed in the Service's processing the application shall not be counted toward the 2-year period.

13.0 COMPONENT INSTRUCTIONS AND REQUIREMENTS

13.1 Introduction

Each White Paper must support one of the specific DoD Component requirements. No general submissions will be accepted. Each DoD Component's requirements are more fully described in the each Component's Annex, as follows:

- **Department of the Army Annex: See Section 13.2**
- **Department of the Navy Annex: See Section 13.3**
- **Department of the Air Force Annex: See Section 13.4**
- **Office of the Secretary of Defense / Defense Agencies Annex: See Section 13.5**

13.2 Department of the Army Annex:

Points of Contact:

Questions of a technical nature for specific Army topics should be addressed to the **Technical POC** listed after each requirement number in this Annex. Questions of a general nature should be addressed to Rob Saunders, 703-617-0279, robert.m.saunders14.civ@mail.mil. Please include the term "U.S. Army RIF technical question" in the subject line.

Specific Instructions:

The invitation for Full Proposal letter will be sent by the Army Contracting Office that will be handling any subsequent contract award, which is NOT the contracting office that issued this BAA. Offerors should follow the instructions provided in the invitation letter.

Army FY2016 RIF Requirements

Requirement Number: ARMY01-PEOAMMO01
Title: Ruggedized Digital Direct Fire Sight
Military System or Acquisition Customer: PEO Ammunition, PM Towed Artillery Systems
Description: The US Army has interest in a howitzer mounted digital direct fire sight capable of engaging targets at ranges of up to 5000 meters in day/ night and obscured conditions. Solutions that are "stand alone systems" or integrated into the existing fire control on the M119 and M777 Howitzers will be considered. It is strongly desired that the weight of the digital direct fire sight be minimized due to weight constraints on the howitzer systems. The proposed solution must be rugged enough to survive the gunfire shock and thermal environment seen on a howitzer. Additionally, a solution would be desired to have day / night capability, operable in all weather conditions, including obscuration such as smoke or haze, range finding capability, and an ability to acquire targets to 5000 meters or greater. Offerers are encouraged as part of the program to offer trades that detail how system cost, weight, size and accuracy are interrelated in terms of building a system that meets all of these parameters, to better inform PM-TAS and the US Army / USMC potential customers. Additionally it is strongly desired that any solution cost less than $50,000 to implement on the howitzers.
Technical Point of Contact: Eugene Conner, 973-724-8822, eugene.c.conner.civ@mail.mil

Requirement Number: ARMY02-PEOAMMO02
Title: Howitzer Simplified Elevation Drive
Military System or Acquisition Customer: PEO Ammunition, PM Towed Artillery Systems
Description: The US Army has interest in a low cost system that would work off of 28VDC, MIL-STD-1275 compliant power, and provide an elevation drive system to add to a fielded howitzer system. This system would allow power to elevate, depress, and to go to certain predefined elevations via push buttons, as well as an elevation as defined via a software input, that would be accessible via a crew operated button. The desired system would have an output speed of greater than ~80 rpm, and have a torque output greater than ~380 lb-in continuous. The system must be simple, low cost, low weight and be able to utilize existing software and hardware interfaces, while also being militarily suitable.

Technical Point of Contact: Jonathan King, 973-724-2415, jonathan.d.king42.civ@mail.mil

Requirement Number: ARMY03-PEOAMMO03
Title: Non-energetic Tracer for Large Caliber Ammunition
Military System or Acquisition Customer: PEO Ammunition, PM Maneuver Ammunition Systems
Description: US Army has an interest in non-energetic tracers for direct fire large caliber ammunition. The Army is seeking novel solutions that will survive the high accelerations, temperatures, and pressures of gun launch while meeting visibility requirements. Conditions for visibility requirements include naked eye, passive night vision devices, and thermal weapons sights. Demonstration of novel capabilities will lead to improvement of current ammunition systems as well as facilitate development of training ammunition for multi-function ammunition.
Technical Point of Contact: Hjalmar (Jay) Canela, 973-724-2743, hjalmar.canela.civ@mail.mil
Requirement Number: ARMY04-PEOAMMO04
Title: Explosive Hazard Detection at Standoff
Military System or Acquisition Customer: PEO Ammunition, PM Close Combat Systems
Description: US Army has an interest in explosive detection technologies at standoff distances while the host platform is moving. Detection of buried and above ground metallic and non-metallic hazards at distances of up to 30 meters with a 1 meter location error is desired. False alarm rate is a key consideration. The system should be lightweight and low power for mounting and operating on a light duty truck/vehicle.
Technical Point of Contact: Manish Bhatt, 973-724-7719, manish.r.bhatt.civ@mail.mil

Requirement Number: ARMY05-PEOAVN01
Title: Advanced Ballistic Protection System (BPS)
Military System or Acquisition Customer: PEO Aviation/Cargo
Objective: The Cargo Helicopter Project Office (PO) is interested in innovative technologies to provide increased protection against small arms fire, to include armor piercing (AP) rounds. The technologies should be lightweight, effective over a wide range of impact angles, and be able to fit within the constraints of the existing Cargo On-Off Loading System (COOLS) under-floor Ballistic Protection System (BPS). Proposed systems should be optimized to provide the best performing solution at the lightest weight possible. Testing of the BPS will be required to substantiate the performance to determine if the BPS meets the Army's requirements.
Technical Point of Contact: Bill Mueller, 256-876-8507, william.j.mueller22.civ@mail.mil

Requirement Number: ARMY06-PEOAVN02
Title: Fusion of Electro-Optical/Infrared (EO/IR) and Radar with Digital Terrain Elevation Data (DTED)
Military System or Acquisition Customer: PEO Aviation/Apache
Description: The Apache PM is seeking innovative approaches to sensor and data fusion to support operations in degraded visual environments (DVE); improve target detection and recognition; decrease navigation errors due to unknown sensor biases; and decrease the pilot's and co-pilot/gunner's (CPG) workloads. Notionally, the system should create a virtual 3-D environment, using DTEDs data as the underlying 'ground truth', in which objects of interest

(based on EO/IR and radar sensor data) are highlighted. Under non-DVE conditions, imagery displayed to the pilot and CPG should be based on fusion of the EO/IR and radar sensor data. For example, the video could be a blend of two imaging sensors (e.g. visible and LWIR) with targets detections indicated with overlaid symbology. When operating in DVE the pilot/CPG should be provided synthetic imagery generated from the DTEDs data and enhanced with the fused sensor data. In addition to providing 'blended' imagery, the system should be capable of performing feature level fusion across sensing modalities to aid in target detection and classification as well as estimate sensor biases via correlation with the DTEDs data. The goal of this RFI is to develop and demonstrate algorithms using the existing Fire Control Radar (FCR) and Modernized Target Acquisition and Designation Sight and Modernized Pilot Night Vision Sensor (M-TADS/PNVS) sensors.
Technical Point of Contact: Robert J. Reynolds, 256-313-4811, robert.j.reynolds130.civ@mail.mil

Requirement Number: ARMY07-PEOAVN03
Title: Secure Wireless Transmission of Situational Awareness and Maintenance Data to Handheld Devices
Military System or Acquisition Customer: PEO Aviation
Description: US Army has an interest in a secure small footprint wireless network inside the Black Hawk series aircraft that provides mobile and untethered connectivity to wireless clients providing sensor data to crew members in the rear of the aircraft and cabin occupants. The system is to provide Situational Awareness information that may include: moving maps (location/GPS information), aircraft state data, full motion video (e.g. externally mounted cameras or UAS video), JVMF Messaging, and diagnostic/prognostic information. Wireless diagnostics sensors should be self-powered and reconfigurable such that they may be moved around the aircraft. A wireless diagnostics sensor could be used to monitor post-repair structural or component integrity or aging aircraft critical components to possibly extend life. Display devices may range from small handheld or tablet devices to helmet mounted heads-up displays or holographic projection. Overall system architecture should be open and/or compatible with FACE standards. Support for multiple levels of security must be architected. The wireless architecture must be isolated (power/safety/security) from other air vehicle systems to avoid/minimize impacts on flight critical systems with a range up to 50 feet. The system must support three or more display devices operating different functions concurrently. The wireless systems should not broadcast any signal when not actively sharing data. Clients should not store or broadcast previous connection information. System should have failover capability to alternate frequency or alternate wireless technology to prevent denial of service. System should be able to prevent, detect, react, and selfheal/restore from APT hacking attempts. System should be federated/one way transmission of maintenance data.
Technical Point of Contact: Casey Carter, 256-955-0796, casey.j.carter12.ctr@mail.mil

Requirement Number: ARMY08-PEOVAN04
Title: Automated Software Test Suite for Unmanned Aircraft System (UAS)
Military System or Acquisition Customer: PEO Aviation, Unmanned Aircraft System
Description: PM UAS seeks capabilities to accelerate and improve testing through automation of all levels of testing (dev, SIL, Ground & Flight) for UAS systems. Current manual testing

process is costly and results in schedule delays adding to the difficulty of maintaining cyber resilient and airworthy systems. The testing capability should be able to track multiple system baselines, emulate manual operator actions, and rapidly and consistently change Platform configurations. Automated test capability should be repeatable, consistent, and verifiable adhering to robust Formal Qualification Test requirements. The resultant product will allow the full software development process to be efficient, resulting in a significant reduction of cost and schedule.
Technical Point of Contact: Cary Pool, 256-313-2402, cary.b.pool.ctr@mail.mil

Requirement Number: ARMY09-PEOC3T01
Title: Low Cost SAASM GPS M-Code Solution for Tactical Radios
Military System or Acquisition Customer: PEO C3T
Description: Currently, PM TR/PEO C3T has waiver to use commercial GPS for Rifleman Radios (AN/PRC-154A) primarily due to cost, power and size limitation. PEO C3T is seeking to develop an ancillary device that implements a SAASM M-Code compatible GPS solution suitable for use in a tactical environment and optimizing size weight and power. The proposed solutions will be able to interface with tactical radios including Rifleman Radios (AN/PRC 154A, AN/PRC 154B, AN/PRC 159), Manpack Radios (AN/PRC 155) and Mid-Tier Vehicular Networking Radios (AN/PRC 118). Per unit cost goal in quantity is <$500, which can potentially save the Army approximately $150M.
Technical Point of Contact: Dr. Sayeed Hasan, 443-395-2651, muhammad.s.hasan2.civ@mail.mil

Requirement Number: ARMY10-PEOC3T02
Title: Tactical Network Emulation Environment
Military System or Acquisition Customer: PEO C3T
Description: This effort involves the development and integration of a tactical network communications system emulation environment to support Army network design analysis, performance testing, and interoperability assessments. This capability should encompass the ability to emulate in real time existing and proposed Army network and transmission/wireless systems while also allowing for the ability to extend the emulation to physical network elements, including radios, satellite terminals, commercial wireless, and baseband network/computer hosts. This capability will allow increased fidelity, accuracy, and performance of hardware and software test fixtures in support of Army network design, development and deployment activities. This capability will reduce the time and cost it takes to field network systems, and reduce the number of hardware and software issues found after deployment by automating required developmental test activities at scale. Will require close coordination with the tactical user community, DoD Laboratories and other partners throughout the process to ensure requirements are met.
Technical Point of Contact: Doug Chaney, 443-395-8440, william.d.chaney8.civ@mail.mil

Requirement Number: ARMY11-PEOC3T03
Title: Lightweight Deployable Antenna Mast Structures
Military System or Acquisition Customer: PEO C3T
Description: Provide lightweight and quick mast structures and deployment mechanisms for both 10 and 30 meter heights. These masts will be used for both dismounted ground and trailer

mounted operation supporting tactical communications systems including Warfighter Information Network – Tactical (WIN-T) and Joint Tactical Radio (JTRS) antennas. Current products are heavy, have poor reliability, and/or require significant manpower to raise to lower safely. Solutions should be deployable in under 10 minutes for the 10 meter and under 20 minutes for the 30 meter. Both masts should be able to support payloads up to 250 pounds, and minimize the use of guy wires.
Technical Point of Contact: Doug Chaney, 443-395-8440, william.d.chaney8.civ@mail.mil

Requirement Number: ARMY12-PEOIEWS01
Title: High-accuracy Optical Character Recognition (OCR) for Modern Standard Arabic (MSA) Language
Military System or Acquisition Customer: PEO IEW&S, PM DCGS-A, PD MFLTS
Description: The US Army needs to augment human linguists with software systems that effectively allow non-linguists to perform low-level translation tasks and document triage. Critical to this capability is accurate OCR for MSA language that can achieve a Word Error Rate (WER) of 15% or better for scanned images of machine printed documents. Scanned documents will be in a variety of Arabic fonts and sizes, and include various kinds of visual noise (speckle, creases, etc.). Candidate software modules should accept input in the form of common image file types, including .JPG, .TIF, and .PNG, and be able to be integrated on common computing platforms within an architecture that ties together other language translation technologies.
Technical Point of Contact: Greg Hartman, 443-861-2592, gregory.c.hartman.civ@mail.mil

Requirement Number: ARMY13-PEOIEWS02
Title: Integration of Mid-wave Infrared (MWIR) Focal Plane Array (FPA) and Improved Readout Integrated Circuit (ROIC) Technology
Military System or Acquisition Customer: PEO IEW&S, PM ASE, PdM Sensors, Advanced Threat Detection System (ATDS)
Description: The US Army has a need to advance Mid-wave Infrared (MWIR) imaging for the detection of missile seekers against aircraft. This requires large area coverage at data rates sufficient for object tracking, but also must be realized in a sensor design consistent with current size, weight, and power (SWaP) constraints. The objective is to demonstrate the integration of a Technology Readiness Level (TRL) 6 or higher MWIR Focal Plane Array (FPA) with an improved Readout Integrated Circuit (ROIC) technology to demonstrate sensor sensitivity, dynamic range capability, and advanced imaging techniques for missile discrimination.
Technical Point of Contact: Jamie Kimbel, 256-842-8709, james.a.kimbel.civ@mail.mil

Requirement Number: ARMY14-PEOIEWS03
Title: Phased Array Electronic Beam Steering for Radar Warning and Radio Frequency Countermeasures (RFCM)
Military System or Acquisition Customer: PEO IEW&S, PM ASE, PdM Sensors.
Description: The US Army is interested in low size, weight, power (SWaP) and cost phased array antenna designs with electronic beam steering capability for use on Aviation platforms for Radar Warning and Radio Frequency Countermeasures (RFCM). These antenna designs will ideally be integrated into existing Radar Warning and RFCM systems, and add flexibility

of beam and pattern control for a variety of techniques and applications. These antenna designs will enable agile steering and track/scanning capability.
Technical Point of Contact: Jamie Kimbel, 256-842-8709, james.a.kimbel.civ@mail.mil

Requirement Number: ARMY15-PEOIEWS04
Title: Force Protection Waterside and Harbor Security Capability
Military System or Acquisition Customer: PEO IEW&S, PM Terrestrial Sensors, PdM EO/IR – Force Protection
Description: The Army has no Waterside and Harbor force protection capabilities that can detect and track small boats, surface swimmers, open circuit divers, closed circuit divers, and Unmanned Underwater Vehicles (UUVs). Sonar is typically the solution of choice for underwater detecting and tracking, but can cause excessive nuisance alarms. Seeking solutions that can automatically (i.e. no human in the loop) detect and track small boats, surface swimmers, open circuit divers, closed circuit divers, and Unmanned Underwater Vehicles with high a probability of detection and very low false alarm rate (false alarm is considered any detection that is not a boat, swimmer, diver or UUV) with a threshold of 250 meters and objective of 1000 meters.
Technical Point of Contact: Jason Ruck, 703-704-0379, jason.e.ruck.civ@mail.mil

Requirement Number: ARMY16-PEOIEWS05
Title: Near Real-time LIDAR Processing and Exploitation Algorithms
Military System or Acquisition Customer: PEO IEW&S, PM Sensors-Aerial Intelligence
Description: The U.S. Army has an interest in automated exploitation algorithms for airborne LIDAR systems. These algorithms would take as input, airborne LIDAR data of a specified geographic area. The input data would contain a high-density point cloud created from numerous passes over the specified area. The area may be partially or completely concealed by foliage typical of northern deciduous summer forest environments. As output, the algorithms would produce compressed data products capable of being transmitted via a 10 Mbps data link. The products can take many forms, examples of such products are: Line-of-Communication delineation, target detection, or 3D scene generation. Ideally, these algorithms would be equally applicable to data generated by any class of LIDAR system (e.g., linear-mode or Geiger-mode). LIDAR exploitation algorithms are the primary goal, however, algorithms that make use of other sensor modalities are also desired.
Technical Point of Contact: Greg Faragher, 443-861-1973, gregory.p.faragher.civ@mail.mil

Requirement Number: ARMY17-PEOIEWS06
Title: Counter Military Grade Communications Capability Development and Implementation Risk Reduction Effort
Military System or Acquisition Customer: PEO IEW&S, PM EW&C, PD EA
Description: The Ground Auto-Targeting Observation Reactive jammer V3 (GATOR V3) is a ground based fixed site Electronic Warfare (EW) system capable of long range active high power directional attack, reactive Electronic Attack (EA), Direction Finding (DF), and Active Monitoring against enemy Command and Control (C2) communications networks as well as Military Intelligence Special Operations (MISO). However, the system was not designed to defeat peer or near-peer military communications. The addition of this capability to the

GATOR V3 baseline would enable the system to be effective in other area of responsibilities (AORs). The development and implementation of techniques on GATOR V3 will not only improve the capabilities of the current system but also serve as risk reduction efforts for future efforts.
Technical Point of Contact: Steve Abbott, 443-395-4856, stephen.r.abbott.civ@mail.mil
Requirement Number: ARMY18-PEOIEWS07
Title: Coherent and Non-Coherent RF Interference Cancellation (Army)
Military System or Acquisition Customer: PEO IEW&S, PM EW&C, PdM EWI
Description: The basic capability of interest is an Interference Cancellation solution that enables commanders at Army tactical echelons to achieve Spectrum Dominance. Innovative RF Interference Cancellation solutions must be able to sense remote and local interference sources, provide a multi tap architecture to support reference and reference less interference sources, and support interference suppression at a minimum of 60 dB for signal bandwidths ranging from 5 to 30 MHz. The integrated solution shall be able to support a switchable Tx path capable of 50W and will switch within 1 usec to a Rx state where the solution must be able to sense power up to +10 dBm and operate from -10 dBm to -90 dBm operating from 100 MHz to 2000 MHz (objective) or 225 – 400 MHz, 1200 – 1600 MHz (threshold). The Rx state shall down convert process the incoming signal and coherent reference perform appropriate digital signal processing techniques and up convert to the same signal frequency after the interference has been removed. The interference sources shall be assumed to be single frequency continuous wave (CW), Swept Bandwidth, Wide Band Gaussian White Noise, Non-Periodic Saw tooth, and other various types of interfering signals. It is assumed that signal separation and other type of algorithms will be utilized to provide a robust solution to support vehicular operation and variability associated with multi-path and antenna coupling variations. The size, weight, and power (SWaP) target for this initiative shall not exceed 6.95" W x 10.5" L x3.0" T. The rapid development of adaptable software definable radio (SDR) architectures, and the reduction of DOD purpose usable spectrum has created a situation where spectrum dependent systems are required to operate in a congested electromagnetic environments. Coupling this challenge with urban non-coherent random interference sources, the DOD requires innovative RF Interference cancellation technologies and techniques to maintain its force capability and freedom to maneuver. The ability to Deny, Degrade and Disrupt anywhere in the electromagnetic spectrum without reducing the capability of existing C4ISR spectrum dependent systems will enable the DOD to achieve Spectrum Dominance.
Technical Point of Contact: Kent Gibson, 443-395-4844, kent.k.gibson.civ@mail.mil

Requirement Number: ARMY19-PEOIEWS08
Title: Inference Engine for Tactical Spectrum Operations (Army)
Military System or Acquisition Customer: PEO IEW&S, PM EW&C, PdM EWI
Description: The focus of this project is development of an inference engine for state estimation of time-stamped spectrum data at Army tactical echelons. Updates to state variables in spectrum feature vectors feed map-based visualization and decision tools used by electronic warfare (EW) officers, spectrum managers, and other Army tactical users. The inference engine should analyze temporal spectrum variations to reduce clutter and estimate state variables from a feature vector with elements such as geolocation, Received Signal Strength, modulation type, power, and hopset. User applications that ingest this information provide a relevant operational picture of the electromagnetic environment. The initial state is

based on data from data repositories, intelligence databases, or threat electronic order of battle. The inference engine then updates state for spectrum-dependent systems with dynamically updated feature vectors. Algorithms underlying the framework may employ Dempster-Shafer (DS) information fusion or Kalman filtering. Effective fusion of this information results in an intuitive and useful format that enables the commander to make accurate, timely, and effective decisions about deploying assets on the battlefield.
Technical Point of Contact: Kent Gibson, 443-395-4844, kent.k.gibson.civ@mail.mil

Requirement Number: ARMY20-PEOMS01
Title: Enhanced Terminal Maneuverability Rocket Motor (Army)
Military System or Acquisition Customer: PEO Missiles and Space
Description: The US Army has an interest in passive variable-area nozzle technology to enable high thrust turn-down operation of a boost-sustain propulsion for increased terminal maneuverability of an Air to Ground Missile system. The added maneuverability will enhance lethality against low signature targets and targets deploying a variety of countermeasures. Approaches should seek to minimize complexity, mass, volume and cost. Solutions should be compatible with Insensitive Munitions progressive minimum smoke propellants.
Technical Point of Contact: Michael Adams, 256-955-0283, michael.s.adams164.civ@mail.mil

Requirement Number: ARMY21-PEOMS02
Title: Radar Counterfire Target Acquisition (CTA) radar Antenna beam shaping for clutter nulling
Military System(s) or Acquisition Program Customer(s): PEO Missiles and Space, PD Counter-Rocket Artillery and Mortar, PdM Radars (SFAE-MSL-CRR), AN/TPQ-53 Counterfire Target Acquisition Radar
Description: Current CTA radar performance can be limited by ground clutter. In order to obtain the most accurate Point-of-Origin estimates the detection of rocket, artillery and Mortar (RAM) targets must occur as close to the launch point as possible. Technologies and solutions that shape the antenna beam to reduce ground clutter while maintaining detection at the lowest possible elevation angles are sought.
Technical Point of Contact: Bob Tan, 443-861-1413, robert.j.tan.civ@mail.mil

Requirement Number: ARMY22-DFSC01
Title: Enhanced or Novel Forensic Analysis Methods
Military System or Acquisition Program Customer: Defense Forensic Science Center (DFSC)
Description: Produce novel and practical tools, software, workflows, or platforms that have the potential to advance forensic applications that assist criminal justice and expeditionary missions in support of warfighters. Examples include development of enhanced touch DNA and/or trace chemical sample collection techniques; development of tools or methods for separation of the various components of a DNA mixture; development of improved tools for examining aged, degraded, or otherwise compromised physical evidence; and development of novel bioinformatics platforms for the interpretation of next-generation sequencing data. Priority consideration will be given to projects that demonstrate potential for increased quality of result and/or decreased time/cost related to the collection, screening, analysis, or interpretation of sexual assault forensic evidence.

Technical Point of Contact: Garold Warner, Office of the Chief Scientist, DFSC, 404-469-7200, garold.c.warner.ctr@mail.mil

Requirement Number: ARMY23-DFSC02
Title: Enhanced or Novel Forensic Analysis Methods
Military System or Acquisition Program Customer: Defense Forensic Science Center (DFSC)
Description: Produce novel and practical tools, devices, software, workflows or platforms that have the potential for forensic application to the support of criminal justice and expeditionary missions through increased quality of results and/or decreased time/cost relative to current procedures. Specific areas of interest include (but are not limited to):

- Improved sample collection and clean-up prior to analysis for all samples of forensic interest.
- Mechanisms for discreet collection of DNA samples.
- Rapid (i.e., less than 10 minutes), in-lab confirmatory screening for body fluids commonly encountered (e.g., semen, vaginal fluid, saliva) in sexual assault cases.
- Portable SNP profiling technology for individual identity without the use of capillary electrophoresis or next generation sequencing techniques. Portable solutions that are fieldable in expeditionary laboratory environments will be considered (e.g., handheld solutions).
- Automated system that performs both purification and assay set-up for known, single source DNA samples (e.g., buccal swabs). Portable solutions that are fieldable in expeditionary laboratory environments will be considered. Sample throughput may be reduced to attain these smaller dimensions.
- In-depth analysis of the significance of DNA matches using limited information (i.e. a small number of loci) and/or alternative markers (i.e. SNPs, indels, etc), and the impact of relatedness within the reference database.
- Detection and identification of organic constituents of gunpowder (e.g. nitrocellulose, diphenylamine, phthalates, ethyl centralite, 2,4-dinitrotoluene) to conclude whether a firearm was discharged and to have the ability to distinguish between handling the weapon, firing the weapon, and simply being present when the weapon was fired.
- Improved inorganic and organic methods for the detection and exploitation of post-blast material in a field environment.
- Use of baroreceptors for identification of explosives or illicit drugs.

Technical Point of Contact: Garold Warner, Office of the Chief Scientist, DFSC, 404-469-7200, garold.c.warner.ctr@mail.mil

Requirement Number: ARMY24-COE01
Title: Military Engineering Technologies for Entry Operations (Army)
Military System or Acquisition Program Customer: PEO/PMs for Force Projection, JPM Guardian, PEO/PM for Contingency Base Infrastructure, PEO Intelligence Electronic Warfare & Sensors
Description: Develop and demonstrate the ability to rapidly increase throughput and protection levels, while decreasing time and resources to support early entry operations. Technologies and products should help planners identify impacts on operations, locate and establish basing, and providing tools for protecting and projecting forces. Force Protection solutions may include passive defense measures suitable for urban environments, protection from and detection of

subterranean threats, methods to assess vulnerability-risk, base layout, and resource allocation prior to and after deployment. Force Projection solutions may include decision support tools for strategic-level remote engineering assessments of infrastructure; operational-level standoff assessments of infrastructure; technologies for remote monitoring of critical infrastructure; mobility planning in dense urban environments; or terrain surfacing technologies for unmanned aerial systems, airfield landing strips, helicopter landing zones, and for Logistics-over-the-Shore operations.
Technical Point of Contact: Pamela Kinnebrew, 601-634-3366, pamela.g.kinnebrew@usace.army.mil

Requirement Number: ARMY25-COE02 **Title:** Tactical Resolution Soil Moisture Modeling
Military System or Acquisition Customer: Distributed Common Ground System-Army; Air Force Weather via US Army G2 DAMI-PIP supported transition **Description:** The Army has interest in the capability to analyze and predict surface soil moisture and soil strength at a spatial resolution of less than 100 meters to support predictive mobility modeling for US Army ground forces operations. Existing DOD geographic information on soil moisture is available at far too course of a resolution to be applied to decision aids relevant to the tactical level. Soil moisture provides a critical input to mobility, energy balance, and biological process models; these types of models will greatly benefit from the increased resolution. The capability must be able to function for all of the COCOMs and support users on Army networks. It must operate in compliance of Army Geospatial Enterprise (AGE) and Standard and Sharable Geospatial Foundation (SSGF) standards. It should provide the capability to be interoperable with other DoD technologies through the use of standardized interfacing. It should be capable of ingesting operational weather products supplied to the Army by the US Air Force 557th Weather Wing (557WW) in order to support the weather-based soil moisture downscaling, and compliant with 557WW data transmission methods.
Technical Point of Contact: John Eylander, 603-646-4188, john.b.eylander.civ@mail.mil

Requirement Number: ARMY26-COE03
Title: Beyond Forecast Support to Weather Impact Modeling
Military System or Acquisition Customer: Distributed Common Ground System-Army
Description: US Army has interest in linking tactical decision aids, specifically sensor performance applications and signature physics models, to historical and long term predictive weather to support situational understanding of the impacts associated with conditions at a given location and time. Army decision aids tied into existing weather services are limited to the temporal coverage of forecast data, often no longer than a couple of days. The need exists to be able to work with climatic and weather conditions outside of this limited time period in order to support intelligence assessments, using the environmental impacts of historic events to better inform future courses of action at the tactical and operational levels. Data must be compliant with the Army Geospatial Enterprise (AGE) and Standard and Sharable Geospatial Foundation (SSGF) standards. Interfaces must be publishable and accessible to other DoD applications in support of broad integration.
Technical Point of Contact: John Eylander, 603-646-4188, john.b.eylander.civ@mail.mil

Requirement Number: ARMY27-PEOSOLD01
Title: Detection of Threat Snipers Equipped with Thermal Scope Technology

Military System or Acquisition Program Customer: Program Executive Office (PEO) Soldier, Project Manager Soldier Sensors and Lasers (PM SSL), Product Manager Soldier Precision Targeting Devices (PM SPTD), Night Vision and Electronic Sensors Directorate (NVESD)
Description: To detect and counter threat snipers targeting infantry units. The US Army needs the capability to counter the proliferation of thermal devices on the battlefield by providing a handheld sensor capable of detecting and countering threat combatants. The resultant system will detect, assess, and cue the user to high confidence threats, while being configured for the lowest possible Size, Weight, and Power (SWAP). Proposals should focus on enhanced and innovative techniques and systems to detect threats employing longwave Infrared technology.
Technical Point of Contact: Jason Miller, 703-704-1828, jason.j.miller74.civ@mail.mil or John Moore, 703-704-3211, john.r.moore387.civ@mail.mil

Requirement Number: ARMY28-PEOSOLD02
Title: Smart Target System for Small Arms
Military System or Acquisition Program Customer: Program Executive Office (PEO) Soldier, Project Manager Soldier Weapons (PM SW)
Description: The equipment and processes associated with data collection for human in the loop live fire events are not optimal, do not reflect current technological capabilities, and are overly reliant on manual input, which is inefficient both in terms of schedule and labor cost, and more importantly, very susceptible to human error and imprecise and gross measurements. As small arms systems and enablers become increasingly complex, understanding the implications of different designs and interfaces on Soldier-system performance becomes increasingly important. The Smart Target system will be a wireless, portable instrumented series of targets that can be employed on any range with no changes to existing infrastructure, and can be used for any small arms test and evaluation, experimentation, assessment or training. The set up will allow for user control of scenario design and automatically collect engagement time (to the millisecond), hit/miss, accuracy, and evaluate correct engagement decisions (targets can be designated friend or foe). Using the Smart Targets system, all information will be collected electronically and will populate a database as the data is collected. By the end of a test/evaluation/experiment, the system user (e.g., tester or experimenter) will be able to query the system to get a snapshot of the different Soldier-system condition results, and will make data reduction and subsequent analysis significantly easier and timelier. The Smart Target System will result in higher resolution Soldier-system performance data collected in a more precise manor, with better information given to critical decision makers quicker and will do a better job of translating Soldier-system performance into requirements and acquisition decisions.
Technical Point of Contact: Dr. Gabriella Brick Larkin, 973-724-8214, gabriella.b.larkin.civ@mail.mil

Requirement Number: ARMY29-PEOSOLD03
Title: Innovative Quartz Disk Resonator Gyroscope (Q-DRG) for Soldier Borne Targeting, Navigation, and Pointing
Military System or Acquisition Program Customer: Program Executive Office (PEO) Soldier, Project Manager Soldier Sensors and Lasers (PM SSL)
Description: The Army Fires Center of Excellence (FCOE) has a critical capability gap in obtaining accurate and reliable target location data from dismounted Forward Observers (FO).

Determining the azimuth (direction) to the target is the #1 contributor to Target Location Error (TLE). The FCOE objective is to provide unmensurated target location to better than 6 meters with 90% confidence (TLE90) to ranges greater than 5Km. The Quartz Disk Resonator Gyroscope (Q-DRG) will provide better than 1 mil Azimuth error which calculates to 6-meter Target Location Error (TLE90) at 5 Km (Cat 1). Additionally, the Q-DRG will enable soldier navigation in GPS denied/challenged environments which is not currently achievable within Size, Weight, Power, and Cost (SWaP-C) constraints. The Q-DRG is expected to have 10x better performance (0.001º/hr bias instability and 0.0001 º/√hr Angle Random Walk) than a typical Navigation grade gyroscope such as the Hemispherical Resonator Gyroscope (HRG) and Fiber Optics Gyroscope (FOG) being considered for the Joint Effects Targeting System (JETS) and Lightweight Laser Designator Rangefinder (LLDR). The Q-DRG offers reduced SWaP-C over HRG and FOG. Breakthrough in Q-DRG performance was made possible using innovative Gradient Force Control (GFC) technique. Recent experimentation has demonstrated the feasibility of exciting and sensing a QRG resonant structure utilizing GFC. This RIF program is to move forward to the next logical step and demonstrate a functioning QDRG packaged in a thermally stabilized Leadless Chip Carrier (LCC) integrated with Electronic Self Calibration and Control electronics. Critical performance characteristics will be measured and analyzed to model performance in various application and operational environments. The QDRG has the potential to be highly disruptive as it could redefine the navigation grade inertial sensor landscape supplanting traditional larger, heavier, and more costly sensors such as Ring Laser Gyroscopes HRGs, and FOGs.
Technical Point of Contact: Dr. Joseph Pellegrino, 703-704-0065, joseph.g.pellegrino2.civ@mail.mil

Requirement Number: ARMY30-PEOSOLD04
Title: Air Soldier Wireless Power and Soldier Hub Integration System with Advanced 14 & 28 VDC Dual Battery voltage System for PdM Air Warrior
Customer: Program Executive Office (PEO) Soldier, Project Manager Soldier Warrior (PM SWAR), Product Manager Air Warrior (PdM AW)
Requirement Description: Provides needed dual supply 28/14 VDC battery, improved capability Hub that meets and exceeds the Integrated Soldier Power & Data System-Core (ISPDS-C) performance specification, has 60 to 125 Watt-Hour of safe & efficient wireless power transfer to Aircrew, and provides performance and airworthiness testing of new product. Would provide a dual power capability for requirements for Air Soldier equipment at ~14.4 VDC power to seamlessly power Air and Ground Soldier worn equipment and also provide 28 VDC for high power (100W) Light-Weight Environmental Cooling System (LWECS) (iaw MIL-PRF-32383/4A performance specification), Integrate and provide with Wireless power on a platform, make platform and Soldier electronics smaller, and rugged for Soldier use environments and platform compatibility. This would directly support Air Soldier requirements, with execution planned for two years or less from time of contract award.
Technical Point of Contact: Dave Schimmel, 703-704-1907, john.d.schimmel.ctr@mail.mil

Requirement Number: ARMY31-PEOSOLD05
Title: Intelligent Rail
Military System or Acquisition Program Customer: Program Executive Office (PEO) Soldier, Project Manager Soldier Weapons (PM SW)

Description: In March 2012, the North Atlantic Treaty Organization (NATO) selected the US Army sponsored design for the standard interface for powered rails. This NATO Standardization Agreement (STANAG), which is being ratified and then adopted, will be applicable to integration for future weapon systems platforms, and weapon mounted enablers/accessories. Although the NATO STANAG specifically addresses power, the US Army sponsored design provides both central power as well as data communication capabilities (i.e., Intelligent Rail) for command and control, data communications between rail-mounted accessories, and networked communication capabilities, among others. This effort will help provide increased situational awareness and overmatch lethality through a system level integration addressing individual, precision and crew-served weapons and respective accessories, optics and enablers. Complete integration will enhance the common operating picture by allowing dismounted infantry, mounted infantry, sniper/observers and Tactical Air Control Parties (TACP's) to rapidly share battlefield data (target location, blue force location, heading and direction, and images) all while keeping their hands on their weapons and focused on the threat. Full implementation of this standard for small arm industry participants will ensure proper integration for future US Army weapon systems acquisition. This will ensure full system standardization and elevate small business participation for future system and system component acquisitions.
Technical Point of Contact: John Heinsohn, 973-724-3275, john.h.heinsohn.civ@mail.mil

Requirement Number: ARMY32-PEOSOLD06
Title: Advanced Technologies for Lighter Weight, Better Performing, and Soldier Protective Equipment
Military System or Acquisition Customer: Program Executive Office (PEO) Soldier, Project Manager Soldier Protection and Individual Equipment (PM SPIE), Product Manager Soldier Protective Equipment (PM SPE)
Description: US Army has a need for advanced material, processing, and integration technology for lighter weight and improved performance Soldier equipment. Novel fiber based, film, or other advanced materials with improved tenacity, durability and ballistic performance are desired for application in hard armor, soft armor, and helmets. Technology is needed for improved hard armor inserts such as ultra-hard ceramics, advanced alternative materials, or novel integration methods. Advanced manufacturing methods are needed for hard armor and combat helmets to improve ballistic performance and reduce weight. High performance energy absorbing materials are needed for blunt impact protection for head, extremities, etc. Advanced transparent materials with improved scratch resistance and ultrafast transitioning are needed to improve ballistic eyewear.
Technical Point of Contact: Virginia Halls, 703-806-5176, virginia.a.halls.civ@mail.mil

Requirement Number: ARMY33-PEOSOLD07
Title: Advanced Materials for Soldier Environmental Protection
Military System or Acquisition Customer: Program Executive Office (PEO) Soldier, Project Manager Soldier Protection and Individual Equipment (PM SPIE)
Description: Advanced materials are needed that provide improved protection from various threats and environments. Environmentally protective materials/systems are needed which provide improved comfort and dexterity for mission execution across a wide spectrum of environments. Thermally protective materials are desired with improved durability, strength, and moisture vapor transport. Alternative spacial vector protection technologies are needed with

increased deterrence, functional time, and low toxicity. Breakthrough alternative concealment technologies are needed. Advanced and innovative ways to improve weight distribution of load carriage equipment are needed. Technologies and processes which combine multiple capabilities, reduce weight and/or reduce cost are desired.
Technical Point of Contact: Suzanne Horner, 703-806-5181, suzanne.e.horner.civ@mail.mil

Requirement Number: ARMY34-PEOSTRI01
Title: Medical Simulation Training Architecture
Military System or Acquisition Customer: PEO STRI
Description: The US Army has an interest in Technologies / Products / Logistics that support the development of an overarching holistic joint medical simulation training architecture and accompanying reference implementation to support Joint Program Office for Medical Simulations. The architecture would form the factual basis for future training solutions/products and integrated solutions with the other training domains. The architecture should leverage to the maximum extent possible existing open framework architectures utilized for medical simulations and training technologies (i.e., OpenSurgSim (OSS), Advance Modular Mannequin (AMM), and BIOGEARS). The architecture should include the domain analysis (across the defense services), framework, governances, and standards as needed to form a comprehensive solution within the training domain. The architecture is also intended to support the research and product development community to help develop newer algorithms and models, which will then be leveraged for efficient prototyping and development tool.
Technical Point of Contact: Dr Jerry Higman, 407-384-5455, jerry.p.higman.civ@mail.mil

Requirement Number: ARMY35-PEOSTRI02
Title: Autonomous Live Domain After Action Review/Feedback
Military System or Acquisition Customer: PEO STRI
Description: The US Army has an interest in Technologies / Products / Logistics that support the development of an autonomous/smart after action review and intelligent tutoring solution. The solution would utilize adaptive learning algorithms to convert training event data gathered by live training domain systems to create echelon appropriate after action review material and tailored tutoring feedback. The after action material and tutoring feedback must include reference to tactical and/or training doctrine and course instruction material, to provide means for self-learning and improvement based on training activities and events. The solution will also create a framework by which the system can be expanded/scaled to provide feedback solutions from individual events through collective combat training center rotations.
Technical Point of Contact: James Todd, 407-384-3905, james.a.todd28.civ@mail.mil

Requirement Number: ARMY36-PEOCSCSS01
Title: Common Pumping Assembly
Military System or Acquisition Program Customer: PEO CS&CSS, PM Force Projection and Integrated Logistics Support Center
Description: The purpose of the Common Pump is to consolidate the requirements of ten different pumping assemblies into a single pumping assembly. The development of a government owned Level III Technical Data Package (TDP) for a Common Pump would result in a drop-in replacement for future sustainment procurements, and at the same time meets the requirements for all future system level procurements across the Petroleum and Water portfolio.

A single pumping assembly design will ease logistic support for the next 30 years, streamline training requirements, and require one technical manual. Over the past 16 years, pumping assembly requirements for sustainment and system procurements were procured under a performance specification. Each procurement with a performance specification introduced a new design that required new technical manual and training packages. Each pumping assembly has a different gauge/instrument panel and startup/shut down procedures for the soldier to navigate. Over the years we have introduced multiple new national stock numbers (NSNs) for items such as starters, wiring harness, pumps, engines and trailer suspensions. Allowing the current status to continue creates a logistics burden that can be avoided with a Level III TDP under a single pumping assembly design. Based on historical experience, offerors should be able to satisfy this requirement at a cost of not to exceed $600,000 and 12 months to complete testing and deliver a Level III TDP.
Technical Point of Contact: Larry Turnipseed, 586-282-7744. larry.c.turnipseed.civ@mail.mil, and Dan Hefel, 586-282-4408, daniel.j.hefel.civ@mail.mil

Requirement Number: ARMY37-PEOCSCSS02
Title: Solar Collection, Energy Storage Hybridization of Army Medium Generators
Military System or Acquisition Program Customer: PM Expeditionary Energy and Sustainment Systems, PdM FSS
Description: A critical capability gap currently exists to provide the Warfighter the ability to seamlessly add Solar Energy while markedly improving the fuel efficiency of standalone Army Medium Generators. A plug-and-play solution must have a Payback Period of five years or less, be ISO Containerized for easy Logistical projection into operational theatres, and be a one for one augmentation of Army Medium Generators. Giving these capabilities to the warfighter requires a three part solution: (1) ISO Containerized Solar Collection, Energy Storage Hybridization System; (2) Army Medium Generator Retrofit Kit with simple open standards communications and a power measuring and monitoring capability; (3) climatic decision making tool based on geographic location and the captured power load profile. Industry has demonstrated in relevant environments and the Marine Corps has bought part (1) ISO Containerized Solar Collection, Energy Storage Hybridization System. The OECIF funded Tactical Microgrid Standards Consortium (DoD/Industry/Academia effort) and RDECOM‘s Energy Informed Operations have technically feasible options for part (2) Army Medium Generator Retrofit Kit with simple open standards communications and a power measuring and monitoring capability. ERDC-CERL has demonstrated a working Hybrid Power Trailer (a 15 kW TQG/80 kW-h of energy storage) at NIE 16.1. PdM FSS has purchased a Department of Energy (DOE) based tool that has transitioned to private sector for part (3) climatic decision making tool based on geographic location and captured power load profile. Operational Scenario to guarantee Five Year Payback period. A sampling of Army Medium Generator with the Retrofit Kit are deployed into the operational theatre to provide power and accurately measure the load profile. PdM FSS uses DOE based tool to simulate and calculate the payback period to make the Go / No Go decision. Army Medium Generators with the Retrofit Kit are moved onto new loads in the operational theatre to verify their five year business case.
Technical Point of Contact: Thomas Merrill (PdM FSS), 508-233-4143, thomas.a.merrill8.civ@mail.mil

Requirement Number: ARMY38-PEOCSCSS03

Title: Improved Lightweight Soldier Power and Energy Distribution
Military System or Acquisition Program Customer: PM Expeditionary Energy and Sustainment Systems, PdD Batteries
Description: Small units require the ability to operate independently without routine resupply for 72 hours. With the proliferation of electronic systems that enable Soldiers and small units to achieve overmatch with current and future foes, Soldiers and small units require lightweight power sources that provide more power at less weight. The use of a wearable central power source will provide for extended mission times by "top charging" the “end item” energy source and with the appropriate Radio Power Adapters (RPAs) can be utilized by all legacy, current and future end items. RPA capability gives the soldier maximum flexibility in selecting the optimum power source to meet mission needs (i.e. traditional batteries or RPAs). RPAs combined with a central power source for longer missions will assist in overall weight reduction for Soldier worn and carried mission batteries. RPAs will facilitate a system approach to power distribution to Soldier worn electrical powered capabilities. RPAs will continue to provide Soldier a "Stand Alone" capability for each peripheral, giving the Soldier maximum flexibility of Soldier powered capabilities.
Technical Point of Contact: Mr. Ted Qualls (PM E2S2/PdD Batteries), 706-545-1705, teddy.d.qualls.ctr@mail.mil and Jose Santos (PM E2S2/PdD Batteries), 703-704-3865, jose.d.santos8.civ@mail.mil

Requirement Number: ARMY39-PEOCSCSS04
Title: Solar Powered Expeditionary Light Set
Military System or Acquisition Program Customer: PM Expeditionary Energy and Sustainment Systems, PdM FSS
Description: Expeditionary settings currently use one of three floodlight sets to illuminate both internal and external base camp areas. The trailer mounted model HLT-3K-5K-MIL is in inventory but obsolete and is being replaced by the USMC model MLT5060MIT for use at Entry Control Points and large area lighting inside the camp perimeter. The COTS item Floodinator (model FNS400SFQT/PCS) is being used for external perimeter lighting. Both replacement models are supplied with power from liquid fueled generators – the USMC model with an on-board generator, while the COTS model requires a separately supplied military standard diesel engine driven generator. Commercially available solar powered light sets would provide a cost and energy efficient alternative while also eliminating noise and exhaust pollution.
Technical Point of Contact: Gary McMichael, 508-233-5626, gary.p.mcmichael.civ@mail.mil

Requirement Number: ARMY40-PEOCSCSS05
Title: Adjustable Reusable Platform for Expeditionary Military Shelters
Military System of Acquisition Program Customer: PM Expeditionary Energy and Sustainment Systems, PdM FSS
Description: With the majority of army shelters setup on non-reusable wooden platforms in order to prolong the shelters' lives while improving the Warfighters', a reusable system that can adjust to a variety of terrain is ideal. With a few options emerging from leading manufacturers, we do not currently have the assets to properly compare them in order to make a recommendation on which designs are optimal when asked by those in the field. A reusable system would ideally reduce waste, be modular in design, and improve the energy efficiency of the shelter.

Technical Point of Contact: John Sullivan (PM FSS), 508-233-5569, john.m.sullivan188.civ@mail.mil

Requirement Number: ARMY41-PEOCSCSS06
Title: Improved Secondary Distribution Center (Army, Air Force, Navy)
Military system or Acquisition Program Customer: PM Expeditionary Energy and Sustainment Systems, PdM MEP
Description: Joint forces require robust, reliable, and resilient power systems to ensure technical superiority in military operations, while minimizing logistics sustainment requirements. A medium-voltage power system supports the tactical benefits of distributed power generation while enabling the resiliency and efficiency of multiple parallel power sources. The Improved Secondary Distribution Center (iSDC) will receive 4160V power from an Army Deployable Power Generation and Distribution System (DPGDS) or Air Force Basic Expeditionary Airfield Resources (BEAR) power source and distribute 120/208V power through receptacles to military equipment. The iSDC will be selectable to receive input from 13.8 kV contracted/commercial power sources or host-nation/existing distribution systems; equipped with low-voltage circuit which provides automatic transfer capabilities from renewable or backup power sources; and be compatible with joint tactical electric power systems. The iSDC will support enhancements, such as metering and remote monitoring, to provide greater capability to future forces, ballistic missile defense, and homeland security missions.
Technical Point of Contact: Michael Richards (PM E2S2 MEPS); 703-704-1741, michael.g.richards6.ctr@mail.mil

Requirement Number: ARMY42-PEOCSCSS07
Title: Tactical Prime Power Transformer (Army)
Military system or Acquisition Program Customer: PM Expeditionary Energy and Sustainment Systems, PdM MEP
Description: Battalion-sized base camps, Combat Support Hospitals, and Force Provider modules require the capability to utilize a medium-voltage Deployable Power Generation and Distribution System (DPGDS) or Basic Expeditionary Airfield Resources (BEAR) power sources, but lack the equipment interface. The Tactical Prime Power Transformer (TPPT) will be a dual-purpose device; which can receive power from a medium-voltage DPGDS or BEAR source, transform down and distribute the power to military equipment; or the TPPT can receive low-voltage power from tactical power sources (AMMPS, LAMPS, TQG, renewables, etc) and transform up to create a distributed power system (microgrid) capable of supporting the entire hospital or base camp. The TPPT provides maximum flexibility and sustainability for joint power systems to support military operations.
Technical Point of Contact: Michael Richards (PM E2S2 MEPS); 703-704-1741; michael.g.richards6.ctr@mail.mil

Requirement Number: ARMY43-PEOCSCSS08
Title: Enhanced Contingency Base Camp Modeling Tools
Military System or Acquisition Program Customer: PEO CS&CSS, Product Directorate Contingency Base Infrastructure (CBI)
Description: PdD CBI currently employs two M&S tools to model base camps and conduct trade analyses in order to optimize base camp designs and achieve reductions in fuel and water

consumption and waste production. These efficiencies produce significant recurring cost savings in base camp operations while simultaneously increasing mission effectiveness. Enhancements to the primary CBI modeling tools, the System of Systems Analysis Toolset (SoSAT) and Whole Systems Trade Analysis Tool (WSTAT), will increase the utility of the tools and lead to better optimization results. Better optimization results will improve the effectiveness and affordability of defense operations. SoSAT enhancements would include development and integration of soldier burdens associated with base camp operations into the analysis trade space to produce better decisions on optimum system sets. Increased mission effectiveness through decreased soldier burdens on the base camp results in more time outside the wire conducting missions. Including this assessment into the trade space provides for a balance between resource optimization and soldier burden. WSTAT enhancements would include refinement of water/power/fuel modeling and improved treatment of attribute constraints to increase fidelity and provide better trade decisions. Enhancements to both tools would improve output analysis capabilities by automating and/or adding additional result views (for example views that identify systems driving fuel/water consumption, waste generation, etc.) to improve key decision maker understanding of the trade space, leading to better decisions and recommendations. More informed decision makers will lead to increased POM investment decisions that are supported by analytical rigor.
Technical Point of Contact: Mr. Jan Kolwey, 309-782-5950, jan.e.kolwey.civ@mail.mil

Requirement Number: ARMY44-RDECOM01
Title: Improvements to Electrical Conductivity of Carbon Fiber Composites for Electromagnetic EnvironmentsMilitary System or Acquisition Program Customer: PEO Missiles & SpaceDescription: The US Army has interest in technologies that provide electrical conductivity enhancements to carbon fiber composite structures to meet electromagnetic environmental effects (E3) requirements. There have been major advances in the field of coating composite structures for electromagnetic capability that have never been considered for Army missile platforms. Development of a low cost, lightweight solution alternative to the use of traditional metal meshes that provide electromagnetic environmental properties as well as adhesion, environmental resistance, safety, and light weight enabling, would result in a solution with potential for use on many missile platforms. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.
Technical Point of Contact: Carissa Russell, 256-313-3919, carissa.d.russell.civ@mail.mil
Requirement Number: ARMY45-RDECOM02
Title: Small Caliber Barrels
Military System or Acquisition Customer: PEO Soldier
Description: The Government is seeking proposals for the development of small caliber barrel advanced technologies to include additive manufacturing technologies or the development of cold spray technology for the manufacture of small caliber barrels. This includes technologies that eliminate the need to change barrels when firing at sustained firing rates of 100 rounds per minute, and eliminates the risk of cookoff after 10 minutes of sustained firing. Proposals should include technologies that permit firing of 300 rounds at cyclic rate of 700 rounds per minute or more without risk of cookoff. Proposals must include materials, manufacturing processes, coatings, liners, and other technologies that permit a minimum barrel life of 15,000 rounds, with the objective barrel life above 50,000 rounds when firing ball and tracer rounds. All technologies

considered must maintain accuracy of the barrel throughout the firing schedule. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.
Technical Point of Contact: Dr. Barton Halpern, 973-724-6009, barton.h.halpern.civ@mail.mil

Requirement Number: ARMY46-RDECOM03
Title: Exoskeleton Sensing and Control Suite / Suit
Military System or Acquisition Program Customer: United States Special Operations Command (USSOCOM) Joint Acquisition Task Force – Tactical Assault Light Operator Suit (TALOS)
Description: Develop a suite or "application" of sensors suitable for human intent recognition, full operator pose tracking and ground contact force interactions in dynamic environments. Redundancy in design allows for tracking in the event of single sensor failure and limited functionality in the event of modal sensor failure. Limited calibration should be needed for use. Sensor "application" or suite should be integrated into a textile base layer suit similar to Physiological Status Monitor Applications. Notional approaches of interest include EMG, IMU and pressure sensors. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.
Technical Point of Contact: Stephanie McElhinny, ARO, 919-549-4240, stephanie.a.mcelhinny.civ@mail.mil

Requirement Number: ARMY47-RDECOM04
Title: Man Packable JP-8 Fuel Cell Power System
Military System or Acquisition Customer: PEO Soldier / PEO MEP
Description: Current soldiers are overburdened with batteries and mission duration is limited by battery energy density. Previous man packable fuel cell demonstrations have focused on alcohol or propane fuels which would require establishment of a new logistics tail. This effort will demonstrate a fuel cell power system that converts JP-8 and diesel fuels into 50 to 300W of electricity that can be directly utilized or used to charge military batteries in a man packable <15 lbs device. System will be designed to reduce soldier carry weight for extended missions and provide > 2000W-hr per kg of JP- 8/diesel. Beyond reducing soldier burden associated with power sources and enabling longer duration missions, capability will also result in cost and logistical savings due to reduction in use of primary batteries. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.
Technical Point of Contact: Dr. Robert Mantz, 919-549-4309, robert.a.mantz.civ@mail.mil

Requirement Number: ARMY48-RDECOM05
Title: Reliable infrared countermeasures (Army)
Military System or Acquisition Customer: PEO IEWS
Description: Demonstrate reliable, compact infrared countermeasures solutions for aircraft or other platforms to increase force protection and survivability resulting from enemy heat sinking missile attacks. With statistically based reliability studies, prove and potentially improve infrared laser reliability of modules used in countermeasures. Mid-infrared 3-5 micron lasers used based on quantum cascade diode lasers with multi-watt output. Seek thorough reliability study of individual lasers and possibly for coherently combined arrays if needed to reach operating power levels of 10 W or more for reduced lifecycle costs and power improvements. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.

Technical Point of Contact: Michael Gerhold, ARL-ARO, 919-549-4357, michael.d.gerhold.civ@mail.mil

Requirement Number: ARMY49-RDECOM06
Title: Affordable C4ISR Technologies
Military System or Acquisition Customer: PEO IEWS, PEO Soldier, PEO C3T, PEO GCS, PEO Ammunition
Description: Affordable C4ISR technologies with an emphasis on multifunction sensors and sensor systems to include electro-optical/infrared sensors, radar and their corresponding electronics for intelligence, surveillance, reconnaissance and target acquisition applications and emerging; algorithms with multi-modal biometrics; biometric sensors for nano-UASs; techniques and algorithms for social media intelligence and sensor management. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.
Technical Point of Contact: Richard Nabors, CERDEC, 703-704-1768, richard.a.nabors.civ@mail.mil

Requirement Number: ARMY50-RDECOM07
Title: Fibers with Active Nanostructures for Next Generation Protective Clothing
Military System or Acquisition Customer: JPEO for Chemical & Biological Defense; PEO Soldier/Soldier Systems
Description: Develop next generation chemical warfare agent-resistant fabrics and/or barriers for use in individual and collective protection applications such as conformal fabric masks, protective suit ensembles, and other barrier systems. Utilize state-of-the-art technologies such as metal-organic frameworks (MOFs),[1] metal oxides,[2] and/or other nanostructures that can be engineered onto/into fibers,[3] fabrics, air permeable membranes,[4] and other such materials. The proposed effort must focus on optimizing reactivity and permeation resistance of chemical warfare agents with thermal burden and moisture vapor transport. A premium is to be placed on reactive (detoxification) as opposed to ab/adsorptive (concentration) agent removal mechanisms. Successful proposals will emphasize the ability to robustly attach active nanostructures to a variety of fibers, the ability to mature the process to scales sufficient to develop clothing, trade-off analysis of chemical warfare agent (and simulant) protection vs. moisture vapor transport and heat stress, and cost-benefit analysis of the proposed process as compared to current state-of-the art materials such as those incorporating activated carbon structures. Multiple large (greater than 1 ft^2) swatches will be delivered to the U.S. Army Edgewood Chemical Biological Center (ECBC) and Natick Soldier Research Development & Engineering Center (NSRDEC). Mature technology solutions are desired that can satisfy this requirement for $1 million or less.

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Technical Focal Point: Gregory W. Peterson, 410-436-9794, gregory.w.peterson.civ@mail.mil

Requirement Number: ARMY51-RDECOM08
Title: Integrated Respiratory and Eye Protective Scarf (IREPS) System (Army)
Military System or Acquisition Customer: JPEO/JPM Protection/PEO Soldier
Description: Select warfighter groups must blend in with indigenous populations to be as inconspicuous as possible. As such, beard growth is commonplace among deployed military personnel due to the regions of recent conflicts. The negative impact of facial hair on respirator performance is well known. To further exacerbate the challenges of protecting bearded warfighters from particulate matter, as well as chemical and biological (CB) threats, many of the head borne components considered to be mission essential for select warfighters (e.g., protective eyewear and communication headsets) do not integrate well with traditional full-facepiece air-purifying respirators. A proof of concept for an initial integrated respiratory and eye protective scarf (IREPS) for respiratory protection and compatibility with head borne devices has been demonstrated. However, a synergistic protective eyewear component was not achieved. This proposal aims to develop a complete respiratory and eye protective scarf system that incorporates unique design features to offer users with or without facial hair protection against nuisance particulate matter, riot control agents, and limited low-level chemical vapor threats. The approach will include fabrication of system prototypes that demonstrate acceptable respiratory and eye protective performance and head borne equipment compatibility through operational performance assessments. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.
Technical Point of Contact: David Caretti, 410-436-6699, david.m.caretti.civ@mail.mil

Requirement Number: ARMY52-RDECOM09
Title: Mano: A One-Handed Environmental Surface Sampling Device
Military System or Acquisition Customer: SOCOM, DTRA Technical Support Group
Description: We have designed a sampling device to facilitate biological sampling using one-hand. This device acts as the actual sampler as well as the transport packaging, therefore, speeding up sampling times and reducing waste. The one-handed operation of the device will simplify sampling while wearing mission oriented protective posture (MOPP) gear in a hazardous environment. This device has been specifically designed to act as both the sampler as well as the transport packaging. We have previously compared the effectiveness of the Mano to the Biological Sampling Kit (BiSKit) that is currently employed by the Department of the Army for large-area surface sampling. Our initial results indicate that the Mano is capable of collecting a *Bacillus anthracis* simulant with greater efficiency than the currently employed BiSKit device in the laboratory. We aim to further develop this technology with continued feedback from end-users. Prototypes developed will be used in a field test to determine effectiveness as well as user feedback on potential improvements. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.
Technical Point of Contact: Daniel Angelini, 410-436-1322, daniel.j.angelini2.civ@mail.mil

Requirement Number: ARMY53-RDECOM10
Title Rapid Rigging/De-Rigging/Soft Landing of Airdrop Platform Loads
Military System or Acquisition Program Customer: PEO Combat Support & Combat Service Support, Product Manager Force Sustainment Systems, Cargo Aerial Delivery – Milestone A for Rapid Rigging and De-rigging Airdrop System projected for FY18
Requirement Description The Advanced Low Velocity Airdrop System (ALVADS) will provide airdropped supplies and equipment in support of Forced Entry (FE) airborne forces. Among the desired ALVADS attributes are the incorporation of new rapid rigging/de-rigging and reduced velocity landing technologies for heavy airdrop platforms to speed the preparation and recovery phases of airborne operations. The Army desires significant time reductions in heavy drop payload rigging, de-rigging after a drop, and a significant reduction (or elimination of) the reliance on energy-dissipating material (honeycomb), while mitigating ground impact force, such that airdrop loads are mission-capable upon arrival on the dropzone. As such, the Army seeks the development and maturation of technologies that either singly or in conjunction with each other are able to provide the capabilities outlined above. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.
Technical Points of Contact: Walter Krainski, 508-233-4614, walter.j.krainski.civ@mail.mil, or Todd Grenga, 508-233-6355, todd.m.grenga2.civ@mail.mil

Requirement Number: ARMY54-RDECOM11
Title: Active Blast Mitigation Technology
Summary: An Active Blast Mitigation System (ABMS) is a system that automatically detects an underbody/IED threat as it occurs and rapidly reacts by signaling countermeasures to protect vehicle occupants and other sensitive equipment. This new technology attempts to neutralize the impulse introduced from a threat by initiating a counter impulse that will minimize or completely negate the impulse experienced. Currently ABMS technology is Technical Readiness Level 6 (TRL6) as verified by TARDEC. In order to advance the TRL to 8/9 further verifications are required including safety, integration feasibility to the existing fleet, and operational assessments. Several PMs (including JLTV, Stryker, LAV, and LTV) are very interested in tracking the maturation of ABMS as a means to meet blast requirements on new and existing vehicles while maintaining mobility. As threats increase, mobility and force projection must be maintained through lightweight approaches such as ABMS. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.
Technical Points of Contact: Jim Park, 586-282-5089, james.m.park24.civ@mail.mil, Pat Griffin, 586-282-0523, patrick.r.griffin.civ@mail.mil

Requirement Number: ARMY55-RDECOM12
Title: Visual Based Localization
Summary: Urban canyons and GPS denied environments present challenges for both soldiers and autonomous systems. Inertial navigation sensors present drift, bias, and cost issues especially for stationary/slow speed operations. However predefined road networks, satellite imagery, and visual cues can offer alternative techniques for maintaining relative position information using camera based systems on modern autonomous systems. Modern autonomous image systems can identify landmarks, road signs, road lanes, and traffic signals, other vehicles, etc., using a host of techniques (text recognition, image classifiers, vehicle orientation, and speed), it should be possible to maintain relative position information with 5-10 m cep over relevant distances (up to

150 kilometers or better) using correlation with locally stored prior information (maps, pre-defined road networks, satellite imagery, and other visual cues) without reliance on GPS and Wi-Fi signals. This level of fidelity should be achievable within an affordable cost structure based on the current state of technology in industry. Mature technology solutions are desired that can satisfy this requirement for $1 million or less.

Technical Point of Contact: Dr. Robert Sadowski, 586-282-5246, robert.w.sadowski2.civ@mail.mil

13.3 Department of the Navy (DoN) Annex:

Points of Contact:

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Specific Instructions: None

DoN Requirements:
The DoN's mission is to deter aggression and, if deterrence fails, win our Nation's wars. Over the next 10-15 years, the DoN will address economic change by being effective and efficient. It will use new technologies and operating concepts to sharpen its warfighting advantage against evolving threats[1]. The DoN's 2016-2020 budget submission reflects its plans to sustain forward presence in places that count, increase capabilities, focus on critical afloat and ashore readiness to ensure our Navy is adequately funded and ready, and enhance the Navy's asymmetric capabilities in the physical domains as well as in cyberspace and the electromagnetic spectrum[2]. The Naval Systems Commands (SYSCOMs) and Warfare Centers list their requirements for supporting that mission and those plans below.

All Naval Programs

Requirement #: FY16-DoN-RIF-ANP-01
Title: ANP: Reduced Naval Total Ownership Cost (TOC)
Military System or Acquisition Customer: All Naval Programs
Description: The DoN seeks technologies and products to reduce TOC through reductions in procurement and sustainment costs. Technologies are sought that improve reliability and operational readiness; that reduce or mitigate system or component obsolescence; that reduce maintenance, manpower and training costs; or that extend service life. In addition, technologies are required that provide scalable energy solutions for diverse environments and reduce energy consumption through greater efficiency and power management.
Technical POC: Tom Gallagher, 703-696-6815, Thomas.J.Gallagher@navy.mil

Requirement #: FY16-DoN-RIF-ANP-02
Title: ANP: Power and Energy Systems
Military System of Acquisition Program: All Naval Programs
Description: New designs of naval platforms, payloads, support systems, and unmanned vehicles and systems have increased capabilities and automation, but as a result have increased power needs. In other words, ships and off-board vehicles will need to accommodate a multitude of energy sources and supply a diverse set of high energy systems. Areas of interest include:
(1) increased efficiency, power density, and component and system integration on platforms, including pulsed power architectures;
(2) efficient power conversion, switching, distribution, conditioning, and control;
(3) efficient power generation equipment including engines, generators, motors, and actuators;
(4) improvement to thermal management of both power producers and users;
(5) energy storage technologies including electrochemical, thermal, dielectric, and kinetic energy storage for ships and, when applied in unmanned vehicles, that have sufficient

[1] CNO's Sailing Directions
[2] CNO's Navigation Plan 2016 - 2020

energy and power density to support extended (e.g., 30 days on station) operations with substantially improved safety characteristics as compared to current solutions;

(6) opportunistic energy harvesting;
(7) power for distributed sensors;
(8) power for communications, Command and Control (C2), intelligence, surveillance and reconnaissance (ISR), Information Warfare (IW), and computing and networking systems;
(9) alternative and renewable energy sources for naval operations including addressing logistics and compatibility with legacy equipment; and/or,
(10) resilient power networks and systems for platforms.

Technical POC: Tom Gallagher, 703-696-6815, thomas.j.gallagher@navy.mil

Requirement #: FY16-DoN-RIF-ANP-03
Title: Naval Surface Warfare Center (NSWC) Carderock: Development of the Additive Manufacturing (AM) Technology
Military System or Acquisition Program Customer: All Naval Programs
Description: Additive manufacturing has the potential to improve maintenance and sustainment operations through reducing long lead times, eliminating obsolescence related issues and increasing readiness. Furthermore, the technology enables improvements to current systems (e.g., lightweighting, part count reduction, increase system performance) through designs that are not possible by conventional manufacturing techniques. However, for the technology to transition from indirect uses to producing qualified end use parts several technology barriers need to be overcome.

(1) Non-destructive evaluation techniques need to be developed to allow the inexpensive evaluation of components produced through additive manufacturing. Correlations also need to be drawn between the detected defects and the corresponding material properties of the component.
(2) Large area additive manufacturing techniques need to be developed to allow the benefits of AM to a larger number of components. To date popular AM techniques either use powder beds that are limited in size to two square feet or direct energy deposition methods that require extensive post processing for acceptable surface finishes. Techniques that allow much bigger components to be produced while maintaining tight tolerances and surface finishes are desired.
(3) Cybersecurity methodologies are desired that ensure data transferred between naval networks and AM equipment are safe and secure. The exploration of methodologies that allow networked AM machine access while ensuring cybersecurity requirements are met is needed.

Technical POC: Ben Bouffard, Benjamin.bouffard@navy.mil, 301-227-5135

SSP

Requirement #: FY16-DoN-RIF-SSP-01
Title: SSP: Reducing Total Ownership Cost of Flight Test Instrumentation
Military System or Acquisition Program Customer: Strategic Weapons Systems
Description: SSP is seeking innovative, cost-effective technologies to meet the requirements associated with submarine position determination, submarine communications, and flight test data recording during Trident II D5 missile flight test operations. SSP's

technology insertion efforts and long-term Vision goals are focused on the development and deployment of alternate support capabilities and future system concepts and architectures to be employed in the missile launch area. Such capabilities include enhanced communications, optics, acoustics, telemetry recording/relay, and submarine position determination systems, as well concepts that provide opportunities for sensor data fusion. Interest also lies in affordable autonomous instrumentation platforms that can reduce human and deployment safety risks, and systems designed for mobility and minimal logistics footprints.
Technical POC: Kamini Leach, 202-433-5768, Kamini.Leach@ssp.navy.mil

Requirement #: FY16-DoN-RIF-SSP-02
Title: SSP: Missile Interface Consolidation
Military System or Acquisition Program Customer: Strategic Systems Programs, Shipboard Systems
Description: The current implementation of missile communication and monitoring in the Strategic Weapon System Fire Control Subsystem (FCS) utilizes a Missile Interface Box design requiring a split backplane: one side supports Fire Control communication, whereas the other side hosts a data processing module to provide missile health and readiness information to the FCS. The current baseline plan is to utilize the legacy Missile Test & Readiness Equipment (MTRE) Mk11 design, which requires a Missile Data Processor module and associated 1553B cabling, for the Strategic Weapon System Ashore (SWSA) facility, and the Ohio Replacement Program (ORP) installations. There is a need for an alternate design approach which would require both hardware and software to integrate the missile monitoring interface into an existing missilized subsystem and utilize the existing Ethernet interface to provide missile health and status data to the FCS, thus eliminating the need for the 1553B bus and associated infrastructure. The savings in material, installation, logistics, and maintenance on the ORP would be significant.
Technical POC: Tim Aberg, (202) 433-8535, Timothy.Aberg@ssp.navy.mil

NAVSEA and Related Warfare Center Requirements

Requirement #: FY16-DoN-RIF-NAVSEA-01
Title: NAVSEA: Improving Warfighting Affordability, Capability, and Commonality
Military System or Acquisition Program Customer: NAVSEA Program Executive Offices/Program Managers for Ships, Submarines, Aircraft Carriers, Littoral Combat Ships, Integrated Warfare Systems, Expeditionary Forces, and Special Warfare.
Description: Deliver near-term, emerging technologies to improve operational capability and effectiveness in a constrained budget and in the face of evolving threat environments. Solutions need to be innovative, affordable, and adaptable to the evolving threats. Solutions should also be applicable across multiple platforms at the single platform and force level through the use of open architecture, modularity and commonality. Proposals should focus on advancing, improving, and enhancing;
(1) Power Projections / Offensive Capability
(2) Ship Self-Defense / Force Protection;
(3) Modernization / enhancement / commonization of combat systems and associated elements;

(4) Warfare system Cyber defense and resiliency;
(5) Unmanned Autonomous systems (UxV) and non-organic sensor integration;
(6) Human systems integration with and across operational systems to improve decision making and reduce sailor / operator workload;
(7) System, platform and cross platform interoperability;
(8) Systems automated test and analysis capabilities;
(9) Equipment and tools to improve arctic and littoral operational capabilities;
(10) Modernization / enhancement / commonization of command, control, communications, computers, combat systems, intelligence, surveillance, and reconnaissance (C5ISR) elements and systems;
(11) Advanced and / or low cost optical, night vision, and infrared signatures technology; and/or,
(12) Combat systems resiliency in Anti-Access/Area Denial (A2/AD) environments.

Technical POC: Allen McConnell, (202) 781-0631, allen.mcconnell@navy.mil, or Douglas Marker, (540) 653-3117, douglas.marker@navy.mil, or Timothy Barnard, (202) 781-4902, timothy.barnard@navy.mil.

Requirement #: FY16-DoN-RIF-NAVSEA-02
Title: NAVSEA: Reducing Production, Operation, Maintenance and Decommissioning Costs
Military System or Acquisition Program Customer: NAVSEA Program Executive Offices/Program Managers for Ships, Submarines, Aircraft Carriers, Littoral Combat Ships, Integrated Warfare Systems, Expeditionary Forces, Special Warfare, and Naval (Public) Shipyards.
Description: In an era when the expected service life of U.S. Navy ships is 30 – 50 years and beyond, NAVSEA needs creative and innovative approaches to reduce Total Ownership Costs. Ownership costs include the design, acquisition, operation, maintenance, modernization, repair, and disposal costs associated with fielding a ship or submarine. Shipboard Preventive Maintenance is critical to ensure ships remain operational to and beyond their expected service life. Also, at the end of service life, disposal and recycling must be efficient and low-cost. Additionally, NAVSEA needs to provide capability and capacity flexibility for production, operation, maintenance, disposal, and repairs at any time. Proposals should focus on enhancements and innovations that:
(1) systemically address component and system obsolescence issues;
(2) provide improved reliability and/or reduced maintenance requirements;
(3) control corrosion and mitigate the resulting degradation;
(4) improve and streamline process and record keeping compliance;
(5) improve techniques, methods, and tools to design / inspect / validate shipboard systems;
(6) improve material and/or personnel transfer at sea technologies;
(7) insert new technologies, equipment and tools into ship maintenance to improve effectiveness, and reduce energy consumption and cost;
(8) methods, tools, and systems to optimize in-service maintenance requirements and modernization planning early in the platform life cycle;
(9) improve techniques, tools, and methods for workforce and/or sailor training / development to ensure trade and technical excellence;
(10) improve safety of sailors and shipyard personnel.

Technical POC: Allen McConnell, (202) 781-0631, allen.mcconnell@navy.mil, or Douglas Marker, (540) 653-3117, douglas.marker@navy.mil, or Timothy Barnard, (202) 781-4902, timothy.barnard@navy.mil.

Requirement #: FY16-DoN-RIF-NAVSEA-03
Title: NAVSEA: Improving Cybersecurity Products and Processes
Military System or Acquisition Program Customer: NAVSEA Program Executive Offices/Program Managers for Ships, Submarines, Aircraft Carriers, Littoral Combat Ships, Integrated Warfare Systems, Expeditionary Forces, Special Warfare, and Naval (Public) Shipyards.
Description: To safeguard the information, tools, systems and controls used to design, procure, operate, and maintain Navy ships, defenses to protect, detect, characterize, counter, and mitigate unauthorized activity and vulnerabilities need to be incorporated in all systems and platforms. Processes for implementing cybersecurity need to create consistency and to allow for rapid changes and adaptations as new threats and methods are identified. Applicable DoD and DoN requirements and instructions will form the foundation of the controls. The resultant system will continually check, assess, probe, and adapt to threats. Proposals should focus on enhanced and innovative:

(1) techniques, tools and approaches for two factor authentication for control systems;
(2) techniques, tools, and systems to detect, protect, identify and react to internal and external threats;
(3) techniques, tools and systems to counter identified threats for both ashore and afloat environments to prevent, anticipate, or mitigate intrusion, data manipulation or exfiltration;
(4) cybersecurity techniques, tools, procedures and systems (hardware and software solutions) to set boundaries, detect intrusions, and prevent unauthorized system access at key points in systems;
(5) techniques, tools, procedures and systems to inject cybersecurity into software and hardware development, configuration, and specifications for both ship systems and critical shore systems to counter cyber threats.

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Requirement #: FY16-DoN-RIF-NAVSEA-04
Title: Naval Undersea Warfare Center (NUWC) – Division Keyport: Additive Hand-Held Cold Spray Repair Technologies
Military System or Acquisition Program Customer: OHIO Replacement Program, VIRGINIA/OHIO/LOS ANGELES/SEAWOLF Class Submarines
Description: "Additive Hand-Held Cold Spray Repair Technologies" refers to a collection of advanced coating processes which are capable of performing dimensional repair of Naval ship or submarine components and structures. Specifically, this technology category involves the development of new technology equipment and processes used to perform manual "hand held" metal deposition buildup of worn and corroded structures using high velocity, kinetic deposition of metal powders. Hand held applications can significantly improve costs by taking the repair tool to the part "in –situ" (on the ship) rather than

removing the part from the ship and performing the repair remotely. The Navy desires the demonstration of the use of Cold Spray technologies as an alternative to brush electroplating repair methods because these methods may also reduce repair cycle time and increase repair durability, providing additional cost benefits.
Technical POC: Patrick Bergan, Phone: 360-396-2706, Email: patrick.bergan@navy.mil

Requirement #: FY16-DoN-RIF-NAVSEA-05
Title: Naval Undersea Warfare Center (NUWC) - Division Keyport: At-Sea Environmental Scavenging and Recharging Station
Military System or Acquisition Program Customer: Unmanned Undersea Vehicles and at-sea sensors and systems, NAVSEA Program Manager Ships (PMS) 406, NAVSEA PMS 485
Description: J**o**int, coalition, and naval forces require unmanned undersea sensors and platforms that can stay deployed at sea for extended periods of time. There is a need to develop new and innovative methods of remotely recharging Unmanned Undersea Vehicles (UUVs) and/or sensor systems by harvesting energy from the sea. The system shall be capable of generating continuous output of 1 Kilowatt (KW) or be able to generate, store up, and dispense on demand 15 Kilowatt Hours (KWh) of energy per day. The system must also be able to operate at depths of up to 2,000 feet below the sea surface. The system should include a dry payload bay of at least 4 cubic feet that has access to the above specified power supply. The system shall be easily transported and assembled at the deployed location.
Technical POC: Wayne Jordheim, 360-396-2870, wayne.jordheim@navy.mil

Requirement #: FY16-DoN-RIF-NAVSEA-06
Title: Naval Undersea Warfare Center (NUWC) – Division Newport: Advanced Technologies for the Undersea Domain.
Military System or Acquisition Program Customer: NAVSEA Program Executive Offices/Program Managers for Ships, Submarines, Littoral Combat Ships, Integrated Warfare Systems, Expeditionary Forces, and Special Warfare.
Description: Undersea capabilities of future adversaries will be greater in number and more advanced. Proliferation of off board and distributed acoustic and non-acoustic sensors, vehicles and weapons will grow at a faster pace than manned system in the undersea domain. There is a need for cross-domain technology solutions supporting the full undersea warfare mission spectrum including awareness, command and control, capacity, and engagement and the following:

- Technology areas advancing awareness, including: ubiquitous observation, advanced sensing, quantum computing and mass data analytics.
- Technology areas advancing command and control, including: networks and communications, information analytics, and human-machine interaction.
- Technology areas advancing capacity, including: unmanned systems, autonomy, and robotics.
- Technology areas advancing engagement (lethal/non-lethal and kinetic/non-kinetic), including: networks, scalability, and autonomy.

Technical POC: Vittorio Ricci, 401-832-9011, vittorio.ricci@navy.mil

Requirement #: FY16-DoN-RIF-NAVSEA-07

Title: Naval Surface Warfare Center (NSWC) Crane and Dahlgren: Shipboard Passive/Augmented Detection and Evaluation (SPADE)
Military System or Acquisition Program Customer: NAVSEA Program Executive Offices for Integrated Warfare Systems and Ships, Program Managers for Above Water Sensors, Surface Weapons, Expeditionary Missions, and Special Warfare.
Description: Improving operational capability and effectiveness in electro-magnetic emissions control, degraded visual environments, and countering evolving threats requires passive and low probability of intercept solutions that are standardized and affordable across multiple platforms and systems (through the use of open architectures, modularity and/or commonality). Proposals should focus on components, modules, or systems that advance, improve, and enhance the following capabilities:

- Shipboard Electro-Optic (EO) and Infrared (IR) Sensors for Surface Warfare (SUW), Anti-Air Warfare (AAW), Anti-Ship Missiles, Unmanned Air Systems, low-flying aircraft), Electronic Warfare, Force Protection, navigation, mine-like object and collision avoidance, Periscope Detection and Discrimination (PDD), Intelligence-Surveillance-Reconnaissance (ISR), Naval Special Warfare (NSW), Search and Rescue (SAR), Underway Replenishment (UNREP), VBSS (visit, board, search, and seizure), and mission support;
- Wide field of view panoramic and hyper-hemispherical EO/IR imaging and non-imaging sensor technologies (e.g., IR, acoustic) for low false alarm detection and tracking of targets and hostile fire;
- Long-range EO/IR imaging sensors for cued acquisition, tracking, target classification, identification, threat assessment, targeting support, and assessment of engagement effectiveness;
- Modular and efficient laser products for fire control rangefinding, active imaging illumination, pointing, marking, designation, and Doppler vibrometry, and wavelength agile countermeasures;
- Sensing technologies for enhanced performance in challenging conditions such as degraded visual environments, solar clutter, high operating temperatures, etc.;
- Sensing and near-real time processing for autonomous target detection, multi-target tracking, precision target tracking and fire control support, geodetic image registration and targeting, aided target recognition and combat identification;
- Additional image processing tools, applications, and modular open systems architecture suites for super-resolution, turbulence mitigation, image fusion, electronic image stabilization, facial analysis, compression, exploitation, dissemination, editing, recording library management, etc.
- Modular open standard integration and interoperability with sensors, combat systems, video distribution systems, navigation, Command, Control, Communications, Computers, & Intelligence (C4I) systems, and associated elements;
- Human systems integration to improve decision making, effectiveness, and reduce sailor / operator workload;
- Improvements in reliability, maintainability, supportability, health and usage monitoring of top degraders;
- Multi-spectral optical window materials and coatings that are survivable in harsh maritime environmental conditions and manufacturable in large sizes;

- Capabilities and techniques to improve the accuracy, environmental resiliency, and automation of alignments between sensors, lasers, and other combat system elements; and
- Enhanced modeling, test, and analysis capabilities for automatic target trackers, precision lab and field boresight alignment, and quantitative approaches to characterizing image processing performance.

Technical POC: Keith Lannan, 812-854-6333, keith.lannan@navy.mil

Requirement #: FY16-DoN-RIF-NAVSEA-08
Title: Naval Surface Warfare Center (NSWC) – Crane Division: Wind Speed and Direction Detection Devices
Military System or Acquisition Program Customer: Program Manager Ships (PMS)-340 Naval Special Warfare (NSW); NSW Commands; Special Purpose Munitions and Weaponry
Description: Naval Special Warfare has a requirement for measuring and transmitting real time downrange wind speed for sniper applications and for winds aloft for calculation of an accurate high altitude release point.

- **Sniper Application**: Sensor capable of measuring and transmitting real-time wind conditions in both daytime and nighttime environments. Conditions should include wind speed and direction, to include gusts. A small handheld or weapons mounted sensor is needed for a detection range of at least 600 yards, with an optimal range of 1,200 yards. Wind speeds should be detected to at least 20 miles per hour (mph) and up to 35 mph with at least 80% accuracy, but 100% accuracy desired at all ranges. Output data display should be visible at night and preferably integrated with a laser range finder data display. Specifications should be less than fourteen ounces, smaller than 6”x3”x2” size, with greater than twelve hours of battery life.
- **Parachuting Application**: Sensor capable of measuring and transmitting real-time wind conditions in both daytime and nighttime environments. A sensor with fewer restrictions on size and weight is needed for high altitude parachute operations capable of detecting wind speed and direction necessary to calculate a high altitude release point, along the calculated flight path and to the desired point of impact. High altitude military freefall drops can be executed at 35,000 feet above ground. Successful sensor technology would measure winds from altitude to ground level.

Technical POC: Rob Walker, 812-854-3921, robert.l.walker@navy.mil; Primary POC for Sniper Application: John Gay, 757-862-0531, john.gay@vb.socom.mil; Primary POC for Parachuting Application: Steve Russell, 757-862-0535, Stephen.russell@vb.socom.mil; Secondary for both: John B. Anderson, 757-862-0520, john.anderson@vb.socom.mil

Requirement #: FY16-DoN-RIF-NAVSEA-09
Title: NSWC – Crane Division: Tactile Heated Gloves
Military System or Acquisition Program Customer: Program Manager Ships (PMS)-340 Naval Special Warfare (NSW); NSW Commands; Special Operations Forces Warfighter Survivability
Description: Develop a reliable heated glove system appropriate for extreme cold environments where dexterity and nimbleness cannot be compromised. Heat output requirements to body temperature with a power duration of a minimum of one hour with desired duration of up to four hours. Power source should not rest on the hand or wrist and

should be lightweight. Thickness of the gloves should be minimal to allow for unrestricted use of the wrists, hands and fingers during use.
Technical POC: Rob Walker, 812-854-3921, robert.l.walker@navy.mil; Primary POC: Steve Russell, 757-862-0535, Stephen.russell@vb.socom.mil; Secondary POC: John B. Anderson, 757-862-0529, john.anderson@vb.socom.mil

Requirement #: FY16-DoN-RIF-NAVSEA-10
Title: Commander, U.S. Pacific Fleet (COMPACFLT): Miniaturized, Long Range Intelligence, Surveillance, and Reconnaissance (ISR) Collection Solution
Military System or Acquisition Customer: Program Executive Office, Submarines (PEO SUB)
Description: Small form factor Unmanned Vehicles (UxV) are being employed with increasing frequency across all uniformed military services. The most common use for these systems is the collection of ISR data coming from electro-optical and/or infra-red sensors. The ability to increase stand-off distances during the collection of these data are desired in order to minimize friendly forces exposure and the risk of counter detection and attack. To this end, proposed solutions should deliver small, electro-optic and/or infra-red data collection that can support imaging of 30 centimeter (cm) ground resolution targets at distances in excess of 72,000 feet while deployed on a platform with payload capacity not to exceed 380 grams, and an overall package to fit inside a right circular cylindrical envelope of 7 cm diameter, 10 cm in length. Proposed solutions may contain elements of novel optical solutions, mechanical stabilization, and image processing techniques in order to mitigate the underlying platform motion. Operational testing will be required to demonstrate the performance of the solution in tactically relevant environments.
Technical POC: Geoffrey Moss, 808-473-5650, geoffrey.moss@navy.mil

NAVSUP

Requirement #: FY16-DoN-RIF-NAVSUP-01
Title: NAVSUP: Leverage Maneuver Capability Technology to Improve Navy Expeditionary Combat Forces' Readiness
Military System or Acquisition Program Customer: Naval Supply Systems Command and Expeditionary Warfighter
Description: Maneuver logistics is quickly emerging as the future of our Naval and Joint Sea-basing Strategy. Expeditionary Warfighter assets from Continental United States (CONUS) and Outside the Continental United States (OCONUS) shore locations require more agile, mobile logistics systems that enable a more flexible and scalable response to changing operational environments and capabilities of potential adversaries. NAVSUP, as a part of its Distributed Agile Logistics (DiAL) concept, will invest in logistics technology enabling the following tactics: 1) At staging bases acquisition planners need to re-purpose new and emerging platforms such as Expeditionary Sea Base/Advanced Forward Staging Base (ESB/AFSB), Expeditionary Fast Transport/Joint High Speed Vessel (EFT/JHSV), and Large, Medium-speed, Roll-on/Roll-off Ships (LMSR) to adaptively position and transport Expeditionary equipment shore to sea, sea to sea and shore to shore; 2) Warfighters and logisticians want to use Global Command and Control System-Maritime (GCCS-M) and Radio Frequency Identification (RFID) technology to track these assets real-time, 24/7; and,

3) NAVSUP Enterprise Logistic Response Teams/Cells (LRT/C) which are operating from these platforms require mobile applications such as secure Voice over Internet Protocol (VOIP) or the Naval Operational Business Logistics Enterprise (NOBLE) program so they can respond to evolving scenarios and communicate with logisticians and stakeholders.
Technical POC: Mark Deebel, (717) 605-7039, mark.deebel@navy.mil

Requirement #: FY16-DoN-RIF-NAVSUP-02
Title: NAVSUP: Leverage Technology to Improved Aerial Cargo Delivery to Fleet Assets
Military System or Acquisition Program Customer: Navy Supply System PMs and the Warfighter.
Description: There is a need within the DoN for innovative solutions for efficient and effective autonomous aerial delivery of parts to the deployed fleet customer, thereby enhancing operational fleet readiness, reducing energy consumption, and reducing total ownership costs. Identify opportunities for expedited order fulfillment strategies making use of emerging technologies that support expedited delivery of materiel and supplies within overseas and CONUS fleet and Navy concentration areas supporting enhanced naval performance. Autonomous discovery of delivery sites with object avoidance and the use of vertical replenishment (VERTREP) sling load cargo carriage is encouraged, but not required.
Technical POC: Mark Deebel, (717) 605-7039, mark.deebel@navy.mil

MCSC and Related Warfare Center Requirements

Requirement #: FY16-DoN-RIF-MCSC-01
Title: MCSC: Unattended Ground Sensors for Atmospheric Sensing
Military System or Acquisition Program Customer: Marine Corps Systems Command, Program Manager (PM) Marine Intelligence, Tactical Remote Sensor System (TRSS)
Description: Development of a compact, man-packable and/or air- droppable Unattended Ground Sensor (UGS) capable of collecting meteorological data from remote locations and transmitting that information to Command and Control (C2) servers via an Iridium or commercial satellite communications (SATCOM) gateway. At a minimum, environmental sensing parameters should include: Temperature, Dew Point, Relative Humidity, Wind Speed, direction (to include gust), barometric pressure, precipitation type and amount, lightning distance and frequency, cloud height (ceilometer), and visibility. Additional parameters to be considered are; Wind Chill, Heat Index, Altimeter Setting, Pressure Altitude, Density Altitude, and Global Positioning System (GPS). Power requirements can include solar and/or rechargeable batteries. Ad hoc networking of the emplaced sensors via a Common Sensor Radio in order to form a broad atmospheric picture and allow data to be delivered in a radio frequency constrained environment. Sensor will utilize the United States On-orbit Segment (OSUS) UGS standards to allow for integration into existing sensor program of record.
Technical POC: Martin Jackson, 703-432-4129, martin.jackson@usmc.mil

Requirement #: FY16-DoN-RIF-MCSC-02
Title: MCSC: Enhanced Power Packs for Javelin and Saber

Military System or Acquisition Program Customer: Marine Corps Systems Command, Program Manager Infantry Weapons Systems (PM IWS), Product Manager (PdM) Anti-Armor
Description: Alternative batteries source or battery interface systems for Javelin and Saber anti-armor missile systems that can provide safer and more efficient power for these systems.
Technical POC: John O'Donnell, phone 301-908-1194, john.h.odonnell@usmc.mil

Requirement #: FY16-DoN-RIF-MCSC-03
Title: MCSC: Vertical Assault Capable 155mm Expeditionary Fire Support System (EFSS)
Military System or Acquisition Customer: Marine Corps Systems Command, Program Manager (PM) Armor and Fire Support Systems, EFSS
Description: Develop and demonstrate an artillery piece which is capable of firing 155mm conventional artillery ammunition and is MV-22 internally transportable. System must be capable of supporting EFSS mission requirements. Key requirements are weight <5,000lbs, firing rate sustained of 2 rounds/minute when operated by a crew of 6 Marines or less, max range of 17 Kilometers (KMs) with non-rocket assisted High Explosive (HE) round (M795 or equivalent), and being towable by Light Strike Vehicle or other MV-22 internally transportable vehicle at least 10 Miles Per Hour (MPH) off-road and at least 35 MPH on paved road. Live Fire is not part of this effort and is not required during the two year Rapid Innovation Fund period of performance – demonstration of system capabilities including aircraft and ground transportability as well as feasibility of concept including firing analysis by the Government team.
Technical POC: Bryan Freeman, 703-432-4259, bryan.freeman@usmc.mil

Requirement #: FY16-DoN-RIF-MCSC-04
Title: MCSC: Program Executive Officer (PEO) Land Systems (LS)/Program Manager (PM) Advanced Amphibious Assault (AAA): Fuel Efficiency and Water Performance Improvements
Military System or Acquisition Program Customer: Amphibious Combat Vehicle Phase 1 Increment 1 (ACV 1.1) & Amphibious Combat Vehicle Phase 1 Increment 2 (ACV 1.2)
Description: ACV 1.1 is an armored personnel carrier that is balanced between performance, protection, and payload for employment within the Ground Combat Element (GCE) and throughout the range of military operations, to include a swim capability. Amphibious vehicles operate on the leading edge of an assault and in austere environments where logistics support including access to fuel is limited. In addition to the weight challenges of land vehicles, amphibious vehicles must also perform in water where weight impacts stability, reserve buoyancy, and water speed. PM AAA is looking for technologies that: 1) reduce fuel consumption; 2) improve the water performance of amphibious vehicles by reducing vehicle drag and improving propulsion efficiency, 3) and/or provide more reserve buoyancy for future growth. Ultimately, these technologies shall enable longer mission durations and/or increased operating ranges for ACV 1.1.
Technical POC: Scott Story, (703) 784-3343, William.story@usmc.mil and Dave Ungar, (703) 784-2040, david.m.ungar@usmc.mil.

Requirement #: FY16-DoN-RIF-MCSC-05

Title: MCSC: Portable Mild Traumatic Brain Injury (mTBI)/Concussion Diagnosis and Monitoring System
Military System or Acquisition Program Customer: Marine Corps Systems Command, Program Manager (PM) Combat Support Systems (CSS), Combat Support Equipment (CSE)
Description: Rapid mild Traumatic Brain Injury (mTBI)/Concussion Indication: This effort would use biomarkers to rapidly detect the presence of proteins associated with mTBI, concussion, and Chronic Traumatic Encephalopathy (CTE). These include Tau proteins, glial fibrillary acidic protein (GFAP), Ubiquitin Hydrolase (UHCL)-1, micro-ribonucleic acid (RNA), and myelin basic protein (MBP), and may include S-100 calcium-binding protein B, neuron-specific enolase, and BB isozyme of creatine kinase (CK-BB). A Marine/Sailor experiencing a single event (head injury or blast exposure) may not present any symptoms, including increased Intra-Cranial Pressure (ICP), and thus be returned to duty too early. However, if the Marine/Sailor has sustained multiple such events, he or she may actually have developed mTBI, concussion or CTE. Biomarkers would provide quantifiable data to a commander to assist in a decision to return a Marine/Sailor to duty. This device would be used in conjunction with the FY14 Non-Invasive ICP Monitoring System to make a more accurate assessment leading to improved treatment. The Non-Invasive ICP Monitoring System determines if brain swelling is readily apparent and medical attention is needed to immediately reduce brain swelling, while this "bio-marker" device will determine any subsequent brain damage, and indicate more specific follow-on treatment, by detecting proteins and enzymes given off that may or may not be present with brain swelling. These two tools would form a "TBI-toolbox" for medical personnel to perform comprehensive tests and make more accurate diagnoses that may aid in reducing the number of long-term disabilities associated with TBI. The overarching goals are for a Food and Drug Administration (FDA)-approved, automated system for the detection and identification of proteins associated with TBI/concussion/CTE, and data storage capacity. The proposed biomarker detection and identification capability should be compatible with existing medical care systems, capable of being used in all operational environments, and usable in aquatic, and ground vehicles employed for patient movement. The device should be powered by secondary cells, and capable of running from both battery and shore power. Shore power is both 110 and 220VAC. The primary power should be batteries. Optimal battery run time could be based on a number of reads/scans, 24-36 scans per single charge, or 8 hours use on a single charge. Overall weight should not exceed 7 kg/15.4 lbs. and should be less than 2 cubic feet.
Technical POC: David Keeler, 703-432-3238, David.Keeler@usmc.mil

Requirement #: FY16-DoN-RIF-MCSC-06
Title: MCSC: Motion Imagery Processing, Exploitation and Dissemination (MIPED)
Military System or Acquisition Program Customer: Marine Corps Systems Command, Distributed Common Ground System Marine Corps Geospatial Intelligence (DCGS-MC GEOINT)
Description: Program Manager Marine Intelligence (PMMI) is seeking capabilities which will enhance the Processing, Exploitation and Dissemination (PED) capability for Motion Imagery (MI). This Rapid Innovation Fund (RIF) effort would provide multiple MI feeds to the United States Marine Corps' Marine Expeditionary Force (MEF) to enhance the PED of

MI analysis by managing content across multiple, independent data stores. This RIF effort would introduce a standards-based motion imagery capability to the MEF Intel Center to ingest, process, store, and stream Full Motion Video (FMV) in support of real-time and forensic PED use cases. Through the use of Virtual Environments, the MEF Intel Center's ability to process MI becomes scalable based on operational needs. In addition, the integration of such a capability provides a solution to meet MI interoperability requirements with DCGS Enterprise, Joint, Non-Governmental Agencies (NGA), North Atlantic Treaty Organization (NATO) and Coalition communities.
This solicitation seeks a comprehensive end-to-end FMV exploitation tool set that meets or exceeds the current solutions for MI PED. The solution would need to comply with the Department of Defense (DoD) Motion Imagery Standards Profile (MISP) and the equivalent NATO Standardization Agreement (STANAG) 4609. The candidate solution must be flexible enough to support laptop implementations for limited numbers of FMV feeds, to full Server/Client enterprise architectures.
Technical POC: Captain Hanley, 703-432-4239, matthew.j.hanley@usmc.mil

Requirement #: FY16-DoN-RIF-MCSC-07
Title: MCSC: Low Volume / High Performing Blast Mitigation Materials and Structures
Military System or Acquisition Program Customer: Marine Corps Systems Command, Program Manager (PM), Ground Vehicle Tactical and Logistics Vehicles
Description: Many current technologies employed on ground vehicle platforms for the protection of crew against mine blast and Improvised Explosive Devices (IEDs) are not effective enough and require significant space claim to effectively manage and reduce accelerations and forces applied to occupant's lower legs and torso. This space claim requirement has a significant detrimental impact on the internal crew volume of ground vehicles that reduces crew stowage and limits vehicle integration designs under crew locations and sub-floors. For example, many high performing crew seats require 3-8" inches of space under the seat to allow for vertical movement of the seat while attenuation mechanisms are absorbing energy. The purpose of this effort is to develop high performing concepts and materials to function and disperse energy with minimal space claim.
Technical POC: Jaspal Brar, (703) 432-2867, jaspal.brar@usmc.mil

Requirement #: FY16-DoN-RIF-MCSC-08
Title: Naval Surface Warfare Center (NSWC) – Crane Division: Single Aperture Laser Range Finder (SLRF)
Military System or Acquisition Program Customer: Naval Special Warfare (NSW), NSW Commands, Marine Corps Forces Special Operations Command (MARSOC)
Description: Traditional laser range finders (LRF) contain two apertures in order to send and receive the laser. This design, while simple, introduces a lot of issues that users, to this point, have just dealt with. Limitations such as; minimum distance restrictions, laser alignment, increased weight, increased size, and increased cost are all due to having the two aperture design. Given the advancement in miniaturization and performance of electronics, optics, and lasers combined with increased commercial markets, the desire now is to develop a SLRF. The basic design concept would be cylindrical to include inside the battery, a single user button, inclinometers/accelerometers, and a display in the back or connector. This

solution needs to be able to be configured for weapon mounted and latched to a standard binocular.
Technical POC: Rob Walker, 812-854-3921, robert.l.walker@navy.mil

Requirement #: FY16-DoN-RIF-MCSC-09
Title: Naval Surface Warfare Center (NSWC), Indian Head Explosive Ordnance Disposal Technology Division (IHEODTD): Electronically enabled initiation, fuzing, and delay technologies for weapon energetic systems
Military System or Acquisition Customer: Cartridge Actuated Devices/Propellant Actuated Devices (Program Executive Office for Unmanned Aviation and Strike Weapons), Mortar System applications (Marine Corps Systems Command), Torpedoes (Program Executive Office, Submarine)
Description: Incorporate technologies such as low energy initiation and microelectronics into weapon systems that will enable Reduced Size Weight and Power (SWAP) requirements through the combined functionality of current system electronics, sensors, and energetic transfers and delays, redesigning/repackaging the electronics, sharing processor capacity, and advanced technology components to provide enhanced capability.
Technical POC: Dr. Kerry Clark, 301-744-4273, kerry.a.clark@navy.mil

Requirement #: FY16-DoN-RIF-MCSC-10
Title: Naval Surface Warfare Center, Indian Head Explosive Ordnance Disposal Technology Division (IHEODTD): Obsolete critical energetic materials for propellants, explosives and pyrotechnics
Military System or Acquisition Customer: MK 99 Gun Propellant and Standard Missile (Program Executive Office (PEO), Integrated Warfare Systems), Cartridge Actuated Devices/Propellant Actuated Devices (PEO for Unmanned Aviation and Strike Weapons), Fire from Enclosure Systems (Marine Corps Systems Command)
Description: The continued availability of currently qualified energetic materials (i.e., explosives, propellants, pyrotechnics, and their ingredients) is a paramount issue for the Department of Defense (DoD). Factors including diminishing domestic suppliers, environmental regulations, current availability and reduced demands for energetic materials are increasing risk for our weapons systems. New sources are needed to demonstrate the manufacturing quality, reliability, and repeatability for current binders, plasticizers, catalysts, and oxidizers to continue Naval and DoD propulsion and explosive acquisition weapon systems.
Technical POC: Dr. Kerry Clark, 301-744-4273, kerry.a.clark@navy.mil

SPAWAR and Related Requirements from SPAWAR Laboratories

Requirement #: FY16-DoN-RIF-SPAWAR-01
Title: SPAWAR: Ultra High Frequency (UHF) Satellite Communication (SATCOM) End-to-End Capabilities
Military System or Acquisition Program Customer: Program Executive Office (PEO) for Space Systems (SS)

Description: Provide technologies that extend Joint Information Environment (JIE) capabilities to deployed UHF SATCOM users. Technologies that enable integration of Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) and weapon systems are preferred.
Technical POC: Austin Mroczek, PEO SS Assistant PEO (APEO) for Science and Technology (S&T), 619-221-7749, austin.mroczek@navy.mil

Requirement #: FY16-DoN-RIF-SPAWAR-02
Title: SPAWAR: Ocean Sensing Payloads for Small/Nano/CubeSats
Military System or Acquisition Program Customer: Program Executive Office (PEO) Space Systems
Description: Provide Naval forces information about the ocean and littoral regions, and any vessels above, on or below the surface. Payloads could include environmental monitoring or Intelligence, Surveillance and Reconnaissance (ISR) sensors. Payloads should be ready to launch for a demonstration mission at the conclusion of the RIF effort.
Technical POC: Austin Mroczek, PEO SS APEO for S&T, 619-221-7749, austin.mroczek@navy.mil

Requirement #: FY16-DoN-RIF-SPAWAR-03
Title: SPAWAR: Information Transport & Infrastructure (ITI)
Military System or Acquisition Program Customer: Navy Multiband Terminal (NMT), Commercial Broadband Satellite Program (CBSP), Automated Digital Network System (ADNS), Consolidated Afloat Networks and Enterprise Services (CANES), Communications Data Link System (CDLS), Advanced High Data Rate (AdvHDR), Link 16, Tactical Switching (TSw), Deployable Joint Command and Control (DJC2), Command and Control Official Information eXchange (C2OIX), Nuclear Command, Control, and Communication (NC3) Emergency Action Message (EAM), and Naval Modular Automated Communications System (NAVMACS)
Description: Develop capabilities to move, manage, and maintain an increasingly large and diverse array of mission-critical data at the rapid pace needed to support effective tactical, operational, and strategic decision-making at sea and ashore. Develop core and ancillary technologies to provide current and emerging wideband satellite communication systems with reliable, robust, and joint interoperable communications capabilities in challenged to severe Anti-Access/Area Denial (A2AD) environments. Technologies of interest include improved cyber solutions for NMT; increase signal processing gain via wider band operation; doubling of data rates without changing the aperture of the antenna; reduction of antenna radar cross section profile; control of antenna sidelobe emissions; reduction of Electro-Magnetic Interference (EMI) effects; reduced ship topside antenna weight, volume and count; dynamic and agile routing capabilities; enterprise-level grid awareness and management; tactical network control; communications diversity; and application services that support critical Command and Control (C2) infrastructure. Potential topics include protected cyber solution augmentation of NMT terminals; full Ka band capable (up to 3.5 GHz) radio frequency/intermediate frequency (RF/IF) front end processors; cooled low noise amplifiers; more efficient RF transmit amplifiers; pseudo monopulse satellite tracking; metamaterial antennas; advanced radomes, RF/IF over fiber optics; multi-band antennas (Q, Ka, and X bands); reduction of antenna/system weight; assured connectivity and access in all

operating environments; persistent network awareness and control; and bandwidth-efficient communication capabilities.
Technical POC: Rafe Pei, PEO Command, Control, Communications, Computers and Intelligence (C4I) APEO for S&T, 619-524-4536, raphael.pei@navy.mil; Dan DelGrosso, PEO Enterprise Information Systems (EIS) Technical Director (TD), 703-604-4480, dan.delgrosso@navy.mil

Requirement #: FY16-DoN-RIF-SPAWAR-04
Title: SPAWAR: Information Security and Information Assurance (ISA)
Military System or Acquisition Program Customer: CANES, Computer Network Defense (CND), Crypto Modernization (Program Executive Office (PEO) Command, Control, Communications, Computers and Intelligence (C4I)); PEO EIS
Description: Develop capabilities and techniques to reduce vulnerability of operational networks and Information Technologies (IT), including risks due to the proliferation of dual-use, commercial solutions and supply chains. Technologies of interest include finding innovative and cost-effective ways to mitigate those vulnerabilities through such measures as Identity and Access Management (IDAM); Attribute-Based Access Controls (ABAC); Trusted Data Format (TDF) tagging; the use of real-time, automated information guards to manage the provision of access to tagged data across multiple security domains; and the employment of modernized cryptographic devices and algorithms to encrypt data at rest and data in motion. Potential topics could be in the areas of assured access and transparent identification and authentication across the network; nimble and proactive network defense posture against advanced persistent threats; detection, prevention and reporting of data exfiltration to counter the insider threat; resiliency under cyber-attack; improved information audit and forensics; and cloud computing security and assurance.
Technical POC: Rafe Pei, PEO C4I APEO for S&T, 619-524-4536, raphael.pei@navy.mil; Dan DelGrosso, PEO EIS TD, 703-604-4480, dan.delgrosso@navy.mil

Requirement #: FY16-DoN-RIF-SPAWAR-05
Title: SPAWAR: Data Integration and Decision Support (DDS)
Military System or Acquisition Program Customer: Naval Tactical Command Support System (NTCSS), Maritime Tactical Command and Control (MTC2), Distributed Common Ground System-Navy (DCGS-N), Naval Integrated Tactical Environmental Subsystem (NITES) - Next, Maritime Operations Center (MOC) (Program Executive Office (PEO) Command, Control, Communications, Computers and Intelligence (C4I)); PEO EIS
Description: Develop technologies to support effective decision-making and the ability to rapidly and confidently move from data to options to informed decisions. Develop improved capabilities to collect data from multiple sources, fuse it, and make it available to all relevant users in the right form, to enable better and faster decisions in any environment including Electromagnetic Maneuver Warfare (EMW) in the presence of Anti-Access Area-Denial (A2AD) threats. Technologies of interest include universal data discovery and access, automated data fusion and integration, improved display and visualization, advanced analytics, user-centric designs, trend analysis, prediction tools, and targeting tools. Potential topics could be in the areas of enhanced data discovery and access, advanced analytics and tools, advanced data display and visualization, mission and operations architecture for improved decisions, and management of sensor overload.

Technical POC: Rafe Pei, PEO C4I APEO for S&T, 619-524-4536, raphael.pei@navy.mil; Dan DelGrosso, PEO EIS TD, 703-604-4480, dan.delgrosso@navy.mil

Requirement #: FY16-DoN-RIF-SPAWAR-06
Title: SPAWAR: Electromagnetic Spectrum Operations (ESO)
Military System or Acquisition Program Customer: Cryptologic Carry-On Program (CCOP), Ship's Signal Exploitation Equipment (SSEE), NITES Next, MTC2
Description: Develop an exceptional awareness of the Electromagnetic Spectrum (EMS) to enable the means to aggressively maneuver through, visualize, protect and control the spectrum at any time or place. Technologies of interest include pervasive sensing, measuring, mapping, predictive modeling and visualization, and overall spectrum agility. Potential topics could be in the areas of acute spectrum sensing and awareness, increased survivability and maneuverability, and EMS synchronization.
Technical POC: Rafe Pei, PEO C4I APEO for S&T, 619-524-4536, raphael.pei@navy.mil

Requirement #: FY16-DoN-RIF-SPAWAR-07
Title: SPAWAR: Non-Kinetic Fires (NKF)
Military System or Acquisition Program Customer: Cryptologic Carry-On Program (CCOP), Ship's Signals Exploitation Equipment (SSEE)
Description: Develop offensive measures that leverage the Electromagnetic Spectrum (EMS) and the "wired" network to deliver weapons, either in information content or sheer energy. Develop both covert and destructive weapons for offensive cyberspace operations (OCO) and jamming. Technologies of interest include electronic attack, RF-enabled cyber incursion, and the characterization of the military effects of each. Potential topics could be in the areas of non-kinetic targeting and engagement, NKF operational aids/modeling/planning, non-kinetic counter Command, Control, Communications, Computers and Intelligence, Surveillance and Reconnaissance (C4ISR), and non-kinetic electronic attack.
Technical POC: Rafe Pei, PEO C4I APEO for S&T, 619-524-4536, raphael.pei@navy.mil

Requirement #: FY16-DoN-RIF-SPAWAR-08
Title: SPAWAR: Assured Positioning, Navigation and Timing (APNT)
Military System or Acquisition Program Customer: Global Positioning Satellite (GPS) based Positioning, Navigation and Timing Service (GPNTS)
Description: Develop Assured Positioning, Navigation and Timing (APNT) capabilities to provide reliable joint interoperable and precise position and time references to surface, sub-surface, air and space-borne assets that enables safety of navigation communications, command and control, combat and weapon systems in challenged to severe environments. Technologies of interest include hardening and modernizing existing GPS-dependent PNT capabilities; development of GPS-independent PNT solutions; cyber solutions to address access and integrity issues; and miniaturized and scalable PNT solutions to reduce Size, Weight and Power (SWaP). Potential topics could be in the areas of protected GPS-dependent PNT capabilities, GPS-independent PNT solutions, PNT cyber solutions, miniaturized and scalable PNT solutions, chip scale atomic clocks, diverse sensor applications, and navigation decision aids.
Technical POC: Rafe Pei, PEO C4I APEO for S&T, 619-524-4536, raphael.pei@navy.mil

Requirement #: FY16-DoN-RIF-SPAWAR-09
Title: SPAWAR: Environmental Battlespace Awareness (EBA)
Military System or Acquisition Program Customer: NITES Next, Maritime Tactical Command and Control (MTC2), Distributed Common Ground System - Navy (DCGS-N)
Description: Develop Environmental Battlespace Awareness (EBA) capabilities to provide knowledge of the current and predictive physical environment and its impact on naval operations from the bottom of the oceans to space. Technologies of interest include efficient and effective collection of environmental data, improved numerical weather and ocean modeling, new and improved tactical decision aides that describe environmental impacts, and decision management tools that fuse operational information, intelligence and system performance information in a predicted environment to support optimal decision-making for asset allocation, weapons and sensor performance, route selection, and execution timelines to maximize warfighter advantage. Potential topics could be in the areas of in-situ environmental sensing capabilities, advanced numerical environmental prediction capabilities, sensor performance prediction capabilities, and decision management capabilities.
Technical POC: Rafe Pei, PEO C4I APEO for S&T, 619-524-4536, raphael.pei@navy.mil

Requirement #: FY16-DoN-RIF-SPAWAR-10
Title: SPAWAR Systems Center Pacific (SSC PAC): Environmental Sensing and Assessments
Military System or Acquisition Program Customer: OSD Environmental Security Technology Certification Program (ESTCP)
Description: Develop capabilities that continually improve Navy environmental quality, security, and force protection without sacrificing military capability. Develop capabilities that provide environmental detection, sensors and systems technology that anticipate and develop response strategies for emerging Navy environmental quality and security issues as well as improve the Navy's environmental shoreside profile. Develop capabilities that support applied environmental assessment, monitoring, and restoration. Develop capabilities that support environmental information technology, modeling, and simulation.
Technical POC: Bart Chadwick, Subject Matter Expert, 619-553-5333, bart.chadwick@navy.mil

NAVAIR and Related Warfare Center Requirements

Requirement #: FY16-DoN-RIF-NAVAIR-01
Title: NAVAIR: Integrated Electromagnetic Maneuver Warfare (EMW) Planner
Military System or Acquisition Program Customer: Program Management Air (PMA)-281 Strike Planning and Execution Systems and aviation platforms/weapons supporting and supported by airborne electromagnetic warfare tools.
Description: Multiple EMW (to include Airborne Electronic Attack (AEA)) tools exist that provide unique solutions for individual capabilities and/or platforms, which are not currently well integrated into overall mission planning and execution tool suites. Additionally, many of these tools exist at different classification levels. The goal of this topic is to facilitate the integration and visualization of these tools into a common planning / execution monitoring

environment for both the supporting as well as the supported platforms. This will significantly improve the effectiveness of multi-platform combat in an enhanced Anti-Access/Area Denial (A2AD) environment.
Technical POC: Bryan Ramsay, (301) 757-6179, bryan.ramsay@navy.mil

Requirement #: FY16-DoN-RIF-NAVAIR-02
Title: NAVAIR PEO(JSF): F-35 Improved Life Cycle Affordability
Military System or Acquisition Program Customer: F-35 Joint Strike Fighter Program Office
Description: F-35 desires maturation and transition of improvements that drive down life cycle cost. The first aspect of life cycle cost is production affordability. Therefore, improvements that drive down Unit Recurring Flyaway (URF) cost, production span time, or improve production quality for F-35 production are desired.
The second aspect of life cycle cost is sustainment. Improvements are desired that reduce sustainment cost by improving reliability or availability of components, reducing cost of spares, improving maintenance man hour requirements, reducing logistics footprint, avoidance of diminishing manufacturing sources, and other methods of life cycle cost reduction.
Technical POC: Amanda Gentry, 937-387-8898, amanda.gentry@jsf.mil

Requirement #: FY16-DoN-RIF-NAVAIR-03
Title: NAVAIR PEO(JSF): F-35 Follow on Development Maturation and Acceleration
Military System or Acquisition Program Customer: F-35 Joint Strike Fighter Program Office
Description: The first increment of F-35 follow on Development includes major systems hardware and software upgrades as well as weapons modification. Desired projects are those which show clear technical risk reduction supporting already approved F-35 upgrade candidates, or reduce the cost/time/complexity of testing new software, hardware, or weapons release, leading to accelerated enhanced capability to the warfighter.
Technical POC: Amanda Gentry, 937-387-8898, amanda.gentry@jsf.mil

Requirement #: FY16-DoN-RIF-NAVAIR-04
Title: NAVAIR PEO(A): ASW Systems for Naval Aircraft
Military System or Acquisition Program Customer: Program Managers for Naval Aviation Anti-Submarine Warfare (ASW) Programs
Description: There is a need for technologies to support the entire ASW detect to engage from fixed and rotary wing aircraft. Specifically, in sensor technology, innovative non-acoustic technologies are needed to rapidly and accurately detect, localize, track and identify submerged targets in various environmental conditions. Algorithm technology is needed to support automated cross-field track of a multi-static active sonobuoy pattern. Software-definable and flexible sensors useful across multiple domains (air, surface, subsurface) are sought. In laser systems, there is a need for blue laser and high duty cycle / high power energy storage systems. For sonobuoys, there is a need for a low cost, anti-tamper and encryption technologies for sonobuoys/sonobuoy launchers. Technologies that facilitate reductions in sonobuoy transducer and antennas size, weight and power are also sought. Lastly, for sonobuoys, technologies that reduce or eliminate drift due to ocean currents are

desired. For ASW tactical decision aids, technologies are sought for integrated moving map displays including underwater bathymetry for ASW environmental situational awareness. Technologies that support multi-platform and multi-sensor ASW mission planning (concurrent passive and active acoustics, radar, electronic support measures, etc.) are also desired. For ASW training/post mission analysis, there is a need for technologies for ASW event reconstruction and automated event documentation for post-mission analysis.
Technical POC: Mr. Shawn Slade, Asst. PEO(A) S&T(ASW), 301-342-0432, shawn.slade@navy.mil

Requirement #: FY16-DoN-RIF-NAVAIR-05
Title: NAVAIR PEO(A): Vertical Lift Platform Enablers
Military System or Acquisition Program Customer: PMs for Naval Aviation rotary winged aircraft
Description: Technologies are needed for Naval Vertical Lift to improve: lift and rotor performance; aeromechanical stability; handling qualities/flight control management systems; engine and drive train performance; increase speed, range and payload capability; improve material development and structural protection; and improve durability; decrease aircraft empty weight. Technologies are needed that mitigate the negative effects of the dynamic interface between aircraft, aircraft carriers and air-capable ships; automate and increase efficiencies in launch, recovery and deck operations; improve handling qualities; and improve structural materials and coatings to withstand high loadings, corrosion, and high temperatures in the shipboard environment.
Technologies are also desired to improve digital interoperability, communications, and connectivity of rotorcraft. Specifically there is a need for technologies addressing: collaboration with unmanned systems, open modular architectures/software/systems, cyber information assurance/anti-tamper (IA/AT), common data link performance enhancements, mitigations for radio frequency interference (RFI)/jamming, and wireless networking internal and external to the aircraft.
Lastly, technologies that improve the ability to operationally sustain rotary wing aircraft are sought that will reduce costs and improve availability. Specifically: Condition Based Maintenance/Health and Usage Monitoring Systems advancements (CBM/HUMS), damage detection systems, Non-destructive inspection (NDI) techniques (ex: infrared and acoustic), spline wear- prevention or repair, composite repair techniques on critical parts, additive manufacturing for flight certified parts, improved maintenance/repair technologies for Total Ownership Cost (TOC) reduction, composite failure prediction, and blade erosion prevention.
Technical POC: Mr. Mike Fallon, 301-342-7890, michael.fallon@navy.mil

Requirement #: FY16-DoN-RIF-NAVAIR-06
Title: NAVAIR PEO(U&W): Range Extension Capability for Small Tactical Unmanned Aircraft Systems (UAS)
Military System or Acquisition Program Customer: Program Management Air (PMA)-263 Small Tactical Unmanned Aircraft Systems Program Office
Description: Current Group 3 Small Tactical UAS are limited to Line of Sight Operations restricting operational ranges to approximately 50 nautical miles (nmi). In support of ground and shipboard military operations extended operational ranges for Group 3 UAS is needed.

Small Size, Weight and Power (SWaP) solutions for enabling extended range operations (>150 nmi) for Command & Control (C2) and Payload operations is needed. Multiple Aircraft relay, Satellite Communications (SATCOM) or hybrid solutions are desired. Antennas, modem, communications architectures and security consistent with Group 3 UAS platform should be considered for innovation.
Technical POC: Maj Gary Shill, 301-342-2089, gary.shill@navy.mil

Requirement #: FY16-DoN-RIF-NAVAIR-07
Title: NAVAIR PEO(U&W): Actively Stabilized Aerial Refueling Drogue
Military System or Acquisition Program Customer: Program Management Air (PMA)-201 Precision Strike Weapons Program Office, Aircraft Armament Equipment/Fuel Containment
Description: PMA-201 is looking to transition the technology that can stabilize the aerial refueling drogue about its natural trail point. This capability will increase the efficiency and safety of manned refueling operations and fill a key technology gap to enable automated aerial refueling. This technology should be compatible with the existing aerial refueling store, including current couplings and drogues.
Technical POC: Steve McLaughlin, 732-323-4058, steve.mclaughlin@navy.mil

Requirement #: FY16-DoN-RIF-NAVAIR-08
Title: NAVAIR PEO(T): Integrated Aircraft Survivability Equipment (IASE)
Military System or Acquisition Program Customer: Program Management Air (PMA)-272 Advanced Tactical Aircraft Protection Systems Program Office
Description: Current Aircraft Survivability Equipment (ASE) systems have been designed, in most cases, to be single spectrum and threat specific. Many systems have been developed using original equipment manufacturer (OEM) proprietary interfaces that have been developed and tested in earlier system development programs. These proprietary interfaces have limited the Government's ability to easily upgrade the systems with technology advancements and have discouraged other OEM's from entering the market place. The Navy seeks to remove the ties to single OEMs and encourage competition within the market place. The Navy has perused a Modular Open Systems Architecture (MOSA) with the goal of developing truly open systems architecture, allowing others to provide capabilities where otherwise only the original OEM would be able. It is envisioned that a system enabler will be utilized to integrating legacy and advanced ASE systems with little or no modification to the current ASE's software or hardware interfaces. This will allow ASE with proprietary interface's to be translated to an '*open interface*', providing a means for other systems to interoperate and seamlessly integrate. This openness will allow the investigation into the advantages of integrating ASE through software algorithms. When done successfully, the Integrated ASE algorithms will allow legacy single spectrum ASE systems to address multi-spectral threats.
Technical POC: Glenn Marshall, 301-342-6735, glenn.marshall@navy.mil

Requirement #: FY16-DoN-RIF-NAVAIR-09
Title: NAVAIR PEO(T): Threat Avoidance, Detection, and Countermeasure Systems
Military System or Acquisition Program Customer: Program Management Air (PMA)-272 Advanced Tactical Aircraft Protection Systems Program Office

Description: Potential solutions are sought to survivability gaps faced by aviation units as they deploy worldwide to conduct full-spectrum operations. Aircraft must be able to face and survive against lethal threats in a wide variety of environments and conditions. Aircraft require new systems that ensure incoming threat munitions, rockets, and missiles can be defeated through jamming, dazzling, expendable airborne countermeasures, or other means in all spectrums. Capabilities are sought to defeat and/or suppress the effects of enemy air defense systems (e.g., infrared (IR), radio frequency (RF), millimeter wave (mmW), ultraviolet (UV), ballistic munitions from heavy machine guns and small arms, and directed energy (DE)) with active, semi-active, and passive countermeasures. Countermeasure systems must prevent guided munitions or their effects from damaging aircraft and have the ability to produce an optimal survivability solution against the most dangerous threats. Detecting, locating, and defeating the source or effects of unguided ballistic munitions (e.g., small arms fire, rocket propelled grenades (RPG) and unguided rockets) is especially critical to the future of aircraft survivability. Aircraft systems must gain and maintain situational awareness of all threats with a detectable signature (e.g., IR, UV, mmW, RF, laser, acoustic, etc.), obstacles, and other hazards.
Technical POC: Glenn Marshall, 301-342-6735, glenn.marshall@navy.mil

Requirement #: FY16-DoN-RIF-NAVAIR-10
Title: NAVAIR AIR-1.0: In-ear noise exposure monitoring
Military System or Acquisition Program Customer: Program Management Air (PMA)-202 Aircrew Systems Program Office
Description: Ships and areas in and around aircraft are extreme noise environments. There is currently no capability to measure daily noise exposure, putting warfighters at risk for noise-induced hearing damage. The system would consist of earplug-integrated or earplug-mounted sensors, external person-mounted microphone, and a data collection/analysis system. A system that incorporates in-ear noise measurements has advantages over legacy systems because it is an accurate measurement of a person's true noise exposure. The proposed capability needs to work in ship Electromagnetic Interference (EMI) environment and needs to transmit data with existing ship networks or function independent of a network. This technology would have both research applications (e.g., objective measurement of real-world person-specific hearing protection performance, evaluation of job-specific noise fields to determine hearing protection requirements) and operational environment applications (e.g., real-time individual noise dose monitoring to prevent noise overexposure). If successful this technology will be integrated into the existing PMA-202 Flight Deck Cranial program.
Technical POC: Mindy Johnson, 301-866-2462, martha.johnson@navy.mil

Requirement #: FY16-DoN-RIF-NAVAIR-11
Title: Naval Air Warfare Center, Weapons Division (NAWCWD): Global Positioning System (GPS)-Independent Navigation (GIN) Using Signals of Opportunity (SoOP)
Military System or Acquisition Program Customer: Small Tactical Air Platforms
Description: Demonstrate GIN using SoOP. Technology must be scaled down from large air platform configurations to meet size, weight and power (SWAP) constraints of smaller Unmanned Aircraft System (UAS). Currently proven ability to create area maps must be improved to provide a navigation solution when GPS is lost or severely degraded. Prefer all-weather, day/night, passive technology. Prefer technology that provides a navigation solution

over the ocean, with effective distance proportional to platform size and distance from shore and islands. Novel solutions will incorporate SoOP frequently encountered with shipping and fishing traffic.
Technical POC: Joe Hewlett, 760-939-0401, joseph.hewlett@navy.mil

Requirement #: FY16-DoN-RIF-NAVAIR-12
Title: Naval Air Warfare Center, Weapons Division (NAWCWD): Net Enabled Weapon (NEW) Wideband/Multi-band Antenna
Military System or Acquisition Program Customer: PMA 201 – NEW.
Description: The future battlefield will require an extensive use of communication. The development and enhancement of NEWs require maintaining a reliable means of communication while also providing the necessary protection features such as low-observability (LO). Datalinks are designed using Software Defined Radio Architecture to allow for growth of future waveforms without the need of hardware replacement. Therefore, there is a need to further support this concept by providing higher-efficiency antennas that will cover wider frequency spectrums in support of current and future waveforms such as Link 16, Tactical Targeting Network Technology (TTNT), Satellite Communications (SATCOM), National Tactical Means (NTM), etc.
Technical POC: Shirli Kleinman, (760) 939-2390, shirli.kleinman@navy.mil

BUMED

Requirement #: FY16-DoN-RIF-BUMED-01
Title: BUMED: Blood borne pathogen and blood typing in support of Naval Expeditionary Health Services
Military System or Acquisition Program Customer: Marine Corps Systems Command, Family of Field Medical Equipment
Description: Combat casualty care in Expeditionary Operations is challenged by the requirement to transfuse blood products. Access to individual blood components (i.e., packed red blood cells, fresh frozen plasma, or platelets) for combat casualty resuscitation at the Role 2 level is often unavailable. Due to the unavailability of individual blood products, expeditionary medical units utilize the walking blood bank. However, access to safe whole blood products is problematic due to the lack of an automated method to identify either blood borne pathogens or the blood type from the donor. The overarching goals are for an FDA-approved, automated, in-line sampling of donated Fresh Whole Blood (FWB) for blood borne pathogen identification, blood type identification, and data storage capacity. The proposed blood borne pathogen and blood typing capability should be compatible with existing medical care systems, capable of being used in all operational environments, and usable in aquatic, and ground vehicles employed for patient movement. The device should be powered by secondary cells, and capable of running from both battery and shore power. Shore power is both 110 and 220VAC. The primary power should be batteries. Optimal battery run time could be based on a number of reads/scans, 48-60 scans per single charge, or 8 hours use on a single charge. Overall weight should not exceed 7 kg/15.4 lbs. and should be less than 2 cubic feet.

Pathogen identification should include at least: Antibody Screen, rapid plasma reagin (RPR) (Syphilis), Hepatitis B Surface Antigen (HBsAg), HB core antibody, Hepatitis C Virus (HCV) antibody, Human immunodeficiency virus (HIV) I/II antibody, Human T-lymphotropic virus (HTLV) antibody, Ultrio (Polymerase chain reaction (PCR) for HIV I/II, HBV and HBV), Chagas, nucleic acid testing (NAT) for West Nile Virus (WNV), Malaria, Leishmaniasis, Creutzfeldt-Jakob Disease (CJD) ("mad cow"), and Zika virus.
Although not mandatory for initial device development, additional consideration for pathogen testing capability expansion would include: Nosocomial pathogen (methicillin-resistant Staphylococcus aureus, vancomycin-resistant enterococci), Enterobacter aerogenes, Streptococcus pneumoniae, Bacterial meningitis, Neisseria gonorrhoeae, Treponema pallidum, Herpes simplex virus, Chlamydia trachomatis, and Trichomonas vaginalis.
Technical POC: D. Keeler, 703-432-3238, david.keeler@usmc.mil

13.4 Department of the Air Force Annex:

Points of Contact:
Technical questions on the Air Force Annex should be addressed to: *Mr. Leonard Walton, AFLCMC/XZI, Air Force RIF Program Manager, leonard.walton@us.af.mil.*

Contracting questions pertaining to the Air Force Annex should be addressed to: *Mr. Timothy Gicale, AFLCMC/WWG, Air Force RIF Contracting Specialist, timothy.gicale@us.af.mil.*

Technical Inquiries: During the open BAA period, offerors may submit technical questions regarding specific Air Force topic areas directly to the **Technical POC** (TPOC) listed under each topic. Offerors have an opportunity to ask *technical questions* only about specific requirements. Questions should be limited to specific information related to improving the understanding of a particular requirement. Offerors may not ask for advice or guidance on solution approach and may not submit any material to the technical POC. All questions must be received NLT 3:00 p.m. EDT, April 15, 2016.

Specific Instructions:
The following additional provisions or clauses are applicable for the Air Force.

DoD BAA, paragraph 9.5.1: White Paper Structure, Section Three – Quad Chart
The Air Force requires that all Quad Charts be prepared outside of the Air Force Rapid Innovation Fund Submission Website in Landscape orientation and then uploaded to the Air Force Rapid Innovation Fund Submission Website as a PDF attachment.

Ombudsman
AFFARS clause 5352.201-9101, Ombudsman (Aug 2005), will be contained in any contracts or agreements resulting from this BAA.

Updates of Publicly Available Information Regarding Responsibility Matters
Any contract or assistance award exceeding $500,000.00 for which an offeror checked "has" in paragraph (b) of the provision 52.209-7 shall contain the clause/article, "Updates of Publicly Available Information Regarding Responsibility Matters (Jan 2011)".

Nuclear Weapons Related Material (NWRM)
Proposed efforts may require management, delivery, or use of Nuclear Weapons Related Material (NWRM). Therefore, AFFARS clause 5352.223-9003, Enhanced Security of Products, is hereby incorporated by reference. If the effort proposed requires NWRM, the offeror will include the appropriate security information as provided by the vendor(s).

Air Force FY2016 RIF BAA Requirement Sponsors:

1. **Air Force Life Cycle Management Center**
2. **Air Force Nuclear Weapons Center Commander**
3. **Air Force Sustainment Center**

4. **Air Force Test Center**
5. **PEO Battle Management**
6. **PEO Business Enterprise Systems**
7. **PEO C3I &N**
8. **PEO Fighter/Bomber**
9. **PEO ISR & SOF**
10. **PEO Joint Strike Fighter**
11. **PEO Space**
12. **PEO Strategic Systems**
13. **PEO Weapons**
14. **Propulsion Directorate**

Air Force RIF BAA Requirements:

1. **Sponsor: Air Force Life Cycle Management Center**

1.a **Title:** Prediction/Detection and Repair of Electrical Faults
Military System or Acquisition Customer: All Weapons Systems
Description: The USAF is seeking existing technologies that can detect shorts/faults, and/or perform in situ repair of damaged insulation to prevent system failures. Conductor deterioration and faults could be caused by corrosion and/or insulation abrasion and cracking. Root causes of field failure of wires embedded in cables and harnesses cannot be identified until the wire installation is stripped or the harness is disassembled. Shorts/faults present maintenance challenges as these types of faults can occur years after installation and are not readily identified by current test equipment prior to failure. The technology approach proposed should identify how it spans USAF enterprise platforms and should be able to be demonstrated and validated in operational scenarios.
Technical POC: Mr. Chris Vickers, christopher.vickers@us.af.mil, 937-255-7707

1.b **Title:** Corrosion and Wear Resistant Low Friction Coatings
Military System or Acquisition Customer: All Weapon System Platforms
Description: Corrosion and wear resistant low friction environmentally friendly coating technologies are needed to replace hard anodizing on aluminum and to replace cadmium and hard chrome plating on steels. The USAF is looking to demonstrate, validate, and transition promising technologies that will result in improved performance and increased service life of coated parts and assemblies across enterprise weapon system platforms. In addition to eliminating hazardous coating and plating operations and procedures, the proposed technologies should be scalable, repairable, cost effective, and environmentally friendly.
Technical POC: Mr. Mike Froning, michael.froning@us.af.mil, 937-255-8679

1.c **Title:** Removal of Paint from Aircraft Wheels
Military System or Acquisition Customer: All Weapon System Platforms
Description: The USAF is seeking non-hazardous, non-chemical technologies to automate coating removal from aluminum aircraft wheels during depot

maintenance overhaul. Use of hazardous paint strippers has become a serious environmental issue for the USAF depot. The proposed technology must be capable of removing the current epoxy primer/polyurethane coating system without damaging the anodized coating on the wheel surfaces. The proposed technology must also have the capability to strip complex shaped geometries of various sizes. The system must remove 100% of the paint and primer to allow for follow-on fluorescent penetrant inspection. The system must be scalable, affordable and capable of meeting current production requirements for de-painting 40-50 two-part wheels (80-100 wheel halves) in one 10-hour shift.
Technical POC: Mr. Randy Straw, randall.straw.1@us.af.mil, 937-255-7730

1.d **Title:** Innovative Additive Manufacturing Technology Demonstration
Military System or Acquisition Customer: All Weapon System Platforms
Description: The USAF is seeking demonstration of an innovative additive manufacturing technology approach to reverse engineer and replace cast metal housings, casings, complex shaped components, and tooling. Approach could consist of printing the part or fabricating tooling/molds to cast the part. Vendor's approach will be judged upon the combined capability to produce maximum part size and accurate dimensional tolerances with minimal surface roughness, requiring minimal post machining and minimum production lead-time. Vendor should clearly state process capabilities.
Technical POC: Mr. Mike Froning, michael.froning@us.af.mil, 937-255-8679

1.e **Title:** Aircraft Component Tracking via AIT Integrated with CBM+
Military System or Acquisition Customer: All Weapon System Platforms
Description: Condition Based Maintenance Plus (CBM+) is a maintenance strategy that performs maintenance actions on critical aircraft components based on evidence of need and predicting failure in a component before it happens. Individual aircraft component tracking is an enabler of CBM that allows the components to be tracked across the life of the component and linked to the environmental conditions and usage seen by the aircraft. Deliver an approach that will integrate and demonstrate part tracking on five components for two pilot program weapon systems (B-1, C-5) using Automated Identification Technology (AIT) through the lifecycle from initial installation throughout the service life. All component technologies should be commercial off the shelf (COTS). The effort should include the development of training materials and implementation toolkits and plans that allow easy implementation of the solution on various aircraft platforms across the Air Force enterprise.
Technical POC: Mr. John Hedke, john.hedke@us.af.mil, 937-656-6873

2. <u>Sponsor: Air Force Nuclear Weapons Center Commander</u>

2.a **Title:** Counter Small Unmanned Aerial Systems (C-sUAS)
Military System or Acquisition Customer: Air Force Global Strike Command (AFGSC)
Description: Seeking innovative technologies to mitigate the threat of Small Unmanned Aerial Systems (sUAS) to stationary and mobile Priority Level 1

Nuclear assets. Small Unmanned Aerial Systems include Class 1 and 2; weight up to 55 lbs., speed up to 250 kts., and altitude up to 3,500 AGL. Feasible technologies should be able to mitigate the threat within a defined range of the asset. Design concepts should include fixed, mobile, and portable options. Detection, tracking, and threat characterization capabilities are highly desired.
Technical POC: Capt Carlos Barrios, carlos.barrios@us.af.mil, 318-456-7828

2.b **Title:** Maturation of Next Generation Thermal Protection Systems
Military System or Acquisition Customer: MMIII SPO
Description: Develop the capability to test novel Thermal Protection Systems in their relevant environment using the X-37B space plane. Several new classes of ultrahigh temperature ceramics, both monolithic and coating have been developed that exhibit properties that could provide a performance advantage to hypersonic flight systems, including ballistic reentry vehicles. Testing these materials under flight conditions is cost prohibitive and development of a testing platform for self-healing and ultrahigh temperature ceramics using the X-37B is needed. Development of a test fixture that will extend from the vehicle during its normal reentry maneuvers and expose a set of samples to high enthalpy flow is required. Upon landing, the samples need to be recovered for forensic tests.
Technical POC: Mr. Raymond Bemish, raymond.bemish@us.af.mil, 505-853-2776

3. <u>Sponsor: Air Force Sustainment Center</u>

3.a **Title:** Advanced OSHA Compliant Blast Cleaning Rooms (No Blast/HM Residue Migration Outside Blast Cleaning Room)
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")
Description: The objective is to develop blast cleaning enclosures (BCE) that eliminate exposure to hazardous materials (HM) due to substantial migration in and around the enclosure to increase the occupational health and safety of Air Force personnel. To achieve this cleaner safer BCE, typical operations and enclosures will be examined to identify mechanisms of HM generation and migration pathways that create or result in a hazardous or potentially hazardous exposure. This examination will make evident commonalities between various types of blast cleaning operations and allow the application of corrective measures that will in turn control HM generation and migration to below OSHA permissible exposure limits (PEL), for both operators and personnel in close proximity to the enclosures. The corrective methods will increase worker safety, increase production where OSHA time-weighted-average exposures rules limit operator exposure time, satisfy tightening OSHA requirements, decrease the need for personal protective equipment (PPE), reduce the likelihood of injury in the case of PPE failure, and ensure that personnel in adjacent "safe zones" are guaranteed to be safe from exposure.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.b **Title:** Blast Booth Noise Reduction - An OSHA Compliance Issue
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")

Description: Reduce employee exposure to hazardous noise during Blast Cleaning Room (BCR) and Blast Cabinets (BC) abrasive media blasting operations to or below OSHA 8-Hour Time Weighted Average without increasing ergonomic stress on the operator in a relevant operating environment consistent with AF Technical Order TO 1-1-8.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.c **Title:** Hand Held Real Time Particulate Loading Sensor
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")

Description: The system will be capable of real time measurement of both local and standoff particulate emissions with compliance to EPA standards, integrated into a small package, that is capable of making local and standoff PM and opacity measurements up to 300 meters away.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.d **Title:** No Fault Found
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")

Description: Certain aircraft circuit card assembly's exhibit high "No Fault Found" (NFF) rates when tested yet fail when installed. Investigations of this problem have found numerous bad actor circuit card assemblies that fall in this category. These conditions negatively impact the workflow and efficiency of the maintenance depots. Estimates have indicated as high as 50% NFF on legacy aircraft electronic modules.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.e **Title:** Analysis of Resources with Visualization and Integrated Simulation
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")

Description: Current Ramp throughput operation requires situational awareness about delays with multiple variables: aircraft status sheet reflecting updated snapshot, but no visualization of entire Ramp overview for Base Commander and Master Planner. Simulations for stations and tactical actions exist, but not for overall Ramp capacity planning and analysis. Desired capabilities include: provides integrated, one-stop user interface for legacy and COTS systems for single access, ability to visualize entire facility with ability to view individual aircraft condition in any station, and provides detailed Ramp capacity planning module integrating existing station planning simulation.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.f **Title:** Data-Driven & Goal-Driven Condition-Based Predictive Maintenance
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")

Description: Large scale maintenance and overhaul of most Aviation Support Equipment (SE) is based on the time interval of three years. This interval is fixed, with no regard for equipment condition, condition of coating or durability of corrosion preventive compound (CPC) system. This fixed interval has been a barrier to the implementation of new materials and the resolution of long standing corrosion issue and problems with SE. The development of platform maintenance schedules is a key focus area of any program. A data-driven scheduling method that accounts for equipment condition is necessary to break the time-based method. A revised and flexible rework schedule may permit SE to remain in service for longer periods prior to rework. A method to develop corrosion data and model corrosion degradation is presently under development, and has great promise for application to SE. It will identify high corrosion risk areas. These high risk areas will be investigated for current degradation, and platforms with little to no degradation even in high risk areas will be candidates for extended maintenance schedules.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.g **Title:** Process Control Tools
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")

Description: Achieve both cognizance and control of the technical processes that are planned, conducted, and executed throughout the depots. Inclusive technologies are: utilizing on-demand technical information and process metrics via advanced Business Process Management (BPM) tools in a lean/six sigma environment, and analysis and statistical process control (SPC) of back shop processes, e.g. plating, NDI, and machining operations.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.h **Title:** Safe, Green Workplace
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")

Description: Eliminate unsafe working conditions and costs resulting from continued use of hazardous materials during depot maintenance operations, and reduce the amount and cost of process energy consumed during the continued use of energy-intensive equipment during depot maintenance operations. This includes: cost-efficient coating/plating application and removal technologies that are environmentally friendly; portable containment technologies to abate noise and mitigate hazardous materials exposure during on-aircraft maintenance; technologies to improve energy efficiency, enhance energy resiliency, and reduce dependence on fossil fuels; commercial electrical grids and traditional compressed air and steam systems through alternative energy storage; power

systems; renewable energy production and more energy efficient equipment use; and energy loss monitoring and management system.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.i **Title:** Efficient Depot
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")
Description: Improve the operations within the MRO environment to safely return a consistently high quality asset (weapon system, engine, and commodity) to the war-fighter at the best possible time and cost. Enhance depot manufacturing and/or repair productivity through reduced machine and/or process downtime. Key aspects of the efficient depot include 1) factory/depot Command, Control & Communications (C3) - ability to report, view and control all factory operations and resources across Air Logistics Complexes (ALCs), 2) flexible, reconfigurable, and responsive depot infrastructure and support equipment, 3) comprehensive one-pass on-condition assessment of the weapon system, 4) operations precisely tailored to the on-condition maintenance requirement and scripted to optimize the repair and return to the customer, 5) instantaneous real-time collaboration with Subject Matter Expert (SME) community, 6) advanced automation - flexible and reconfigurable automation systems working in close proximity with, and augmenting the human workforce, 7) effective exploitation of emerging processes - rapid adoption, certification, and transition of game changing processes, and 8) enhanced on-time delivery.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.j **Title:** Ergonomic Assist, Automation, and Robotics Implementation
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")
Description: Develop ergonomic assist technologies focused on reduction in labor hours, reduction in workforce injuries, and/or reduction in hazardous/unsafe working conditions. Develop robotic paint capabilities in the commodity repair and aircraft paint arenas. Also inclusive are: Mask-less/reduced-masking process improvements such as aerodynamic sealing of aircraft outer mold lines, or other processes that rely upon masking for proper process quality; outer mold line aircraft robotic NDI inspection capability utilizing sensor fusion technology capable of detailed crack detection and corrosion damage measurement; and paint quality evaluation.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.k **Title:** Reduced Cadmium & Chromium Use During Depot Overhaul of Engines & Aircraft
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")
Description: Occupational Safety and Health Administration (OSHA) abatement costs at the AF overhaul depots currently exceed $70M/year. Substitute materials

and processes are sought to minimize the use of Cd and Cr and associated exposure to health hazards. Substitute materials would be equal or better in terms of corrosion resistance and wear properties.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.l **Title:** Non Destructive Inspection Data Collection and Storage
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")
Description: Seeking the development of active Non Destructive Inspection recording of a broad array of inspection techniques to automate the collection, transmittal, digital storage, and data management of the inspection results to the cognizant engineering authority at the commodity serial number and aircraft tail number level.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

3.m **Title:** Industrial Manufacturing & Repair, Supply Chain, and Sustainment Engineering Digital Thread
Military System or Acquisition Customer: Aviation platforms, Air Logistics Complexes ("Depots")
Description: Seeking the demonstration of a scalable digital thread architecture to enable efficient access to all forms of enterprise data in support of Industrial Manufacturing & Repair, Supply Chain, and Sustainment Engineering activities. Capability should assist in ushering in the digital thread domain at the commodity serial number and aircraft tail number level.
Technical POC: Mr. Tracy Mullen, tracy.mullen@us.af.mil, 801-775-5323

4. <u>Sponsor: Air Force Test Center</u>
<u>Sub Sponsor: AEDC</u>

4.a **Title:** Missile Warning System (MWS) Towed Optical Plume Simulator (TOPS)
Military System or Acquisition Customer: PEO Aircraft Survivability Equipment (MultiService)
Description: Development and Operational testing of missile warning systems on USAF and other Service aircraft requires a variety of techniques, including airborne signature simulators. To support testing requirements for F-35 and Next-Generation aircraft, innovative solutions are sought to supply a subsonic airborne towed pod that contains an ultraviolet (solar blind) emitter and two Mid-wave infrared (MWIR) emitters. Suitable emitters must be non-combustion-based and may include lasers, light emitting diodes (LEDs), and lamps. The photons from the emitters must be directed to a gimbaled mount that includes a pointing/tracking system so that the photons can be directed at a target aircraft. The emitters must have sufficient optical power (up to 10,000 w/sr) to supply missile-representative irradiance at the receiving optics of the missile warning system on the aircraft under test.
Technical POC: Dr. Taylor Swanson, taylor.swanson.1@us.af.mil, 931-454-4240

4.b **Title:** Hostile Fire Indication (HFI) Remote Optical-Sensing of Missile Attitude (ROMA)
Military System or Acquisition Customer: PEO Aircraft Survivability Equipment (MultiService)
Description: A non-contact system to determine missile pitch, roll, and yaw for hostile fire surface-to-air missiles is required. ROMA will provide data to validate the modeling and simulation capabilities which generate missile signature models used for the developmental and operational testing of missile warning systems on USAF and other Service aircraft. Requirements include: resolving pitch and yaw to 1-deg (0.5-deg goal), and absolute roll angle to 5-deg (1-deg goal). Trajectory data update rate: 50 Hz (100 Hz goal). Measurements are required over the complete missile trajectory (2 km max altitude, 10 km downrange, 500 meters cross range), possibly requiring multiple emplacements. Innovative solutions are sought to minimize costs by maximizing the coverage of a single emplacement.
Technical POC: Dr. Taylor Swanson, taylor.swanson.1@us.af.mil, 931-454-4240

Sub Sponsor: 412 TW

4.c **Title:** Energy-Efficient On-Site Waste Remediation
Military System or Acquisition Customer: Joint Deployable Waste to Energy (JDW2E)
Description: Remediation - The Air Force is interested in technologies to process solid waste and recyclables in a more economical and sustainable manner. In the past the enormous amount of solid waste generated by deployed forces was disposed of by burning in open burn pits or burn boxes. This practice exposes troops to potentially harmful particulate matter and air toxics. Novel methods of waste disposal are needed to process waste on-site. Further, this process needs to be self-sustaining from an energy standpoint where the energy needed to operate the system is extracted from the waste material. This solicitation calls for solutions to dispose of waste efficiently, most preferably with the simultaneous conversion of the waste to useful fuels or chemicals. The scalability and robustness of proposed systems are important considerations whether at forward area bases or at stateside military bases the main point is the adequate on-site processing of the waste.
Technical POC: Mr. James Zott, james.zott.1@us.af.mil, 402-232-3032

4.d **Title:** Go to War Signature Assessment
Military System or Acquisition Customer: 5th/6th Generation Stealth Aircraft
Description: Develop a quick, platform specific; in-flight way to ensure the aircraft's radar cross section is ready to go into combat. System should have sufficient fidelity to detect large (TBD) increases in RF signature when compared to specification. This could safeguard combat units from sending an aircraft into battle that has a significantly increased radar cross section due to a faulty repair.
Technical POC: Lt Col Randel Gordon, randel.gordon@us.af.mil, 661-277-2834

4.e **Title:** Fielding GPS Injection Jamming Technology
Military System or Acquisition Customer: Aviation Platforms
Description: Embedded GPS injection jamming is a critical technology that allows aircrews to train and test in GPS contested/denied environments more readily without the restriction imposed on live GPS jamming. Aircrews can train whenever/wherever against real-world threats without frequency clearance restrictions to improve mission readiness. The Air Force Research Laboratory has already flight tested a prototype in an operationally relevant environment (TRL 7), but needs help transitioning the technology to operational aircraft and improving the Manufacturing Readiness Level. Government Furnished Equipment, Intellectual Property, and sample documents will be provided.
Technical POC: Mr. William Deike, william.deike.2@us.af.mil, 937-938-4417

Sub Sponsor: 96TW

4.f **Title:** Enhanced Inertial Test and Evaluation
Military System or Acquisition Customer: Ground Based Strategic Deterrent, Cold Atom Interferometry Navigation System
Description: Reverse Velocity Test Vehicle Capability. Develop and characterize a dynamic testbed that can operate on the Holloman High Speed Test Track (HHSTT) to enable evaluation of strategic-grade inertial components and systems. The test bed must smoothly and accurately follow a defined acceleration & velocity profile in the forward direction, decelerate to a precisely defined stop point, and then reverse direction to return to the original start position. This cycle is repeated continuously to accumulate at least one continuous hour of data.
Technical POC: Dr. Jim Brewer, james.brewer.1@us.af.mil, 576-679-1538

4.g **Title:** Remote Embedded Runway Sensor for Aircraft Tire Integrity Monitoring
Military System or Acquisition Customer: F-35 specifically, but can support all fighter and bomber aircraft
Description: Seeking innovative concepts for embedded runway sensors to remotely determine tire life (number of landings), and potential safety of flight issues. This can be accomplished by developing remote sensing packages that could be dropped into existing military runways utilizing newly advanced materials for shear and normal force measurements at an interface surface. These systems can be first implemented and tested on the 96 TG/OL-AC Landing Gear Test Facility Tire Force Machine (TFM). Utilizing the TFM will assist in the development and understanding of the sensor readings, by generating a final deployable sensor for the field. This sensor can be used for aircraft tire health monitoring, life assessments, hot-pit refueling tire assessments, and other potential safety-of-flight tire condition monitoring. This technology supports current F-35 tire life issues, as well as other fighter and bomber aircraft, by providing real-time tire integrity sensing. Additionally, data collected from sensor has potential to increase tire life, saving on maintenance, procurement, environmental and general lifecycle costs of the weapon system.

Technical POC: Dr. Michael Bohun, michael.bohun@us.af.mil, 937-255-9193, (Alt.) Mr. Andrew Zakrajsek, andrew.zakrajsek@us.af.mil, 937-255-1609

4.h **Title:** Processes for Store/Aircraft Conducted EMI Evaluation
Military System or Acquisition Customer: AFMC, 96th Test Wing, US Air Force SEEK EAGLE Office (AFSEO)
Description: Seeking innovative comprehensive solutions that provide an end-to-end process to predict and quantify the likelihood of Conducted Electromagnetic Interference (EMI) to USAF aircraft equipment and avionics from stores in carriage in or on the aircraft. It is desired that a generic 'store simulator' be developed be substituted for actual stores in carriage. AFSEO vision is that a simulator can inject controlled levels of noise into aircraft cabling. The comprehensive process should then track, quantify and evaluate possible EMI at critical points. Solutions should leverage Commercial off the Shelf (COTS) simulation technology (for example CST Studio Suite, or FEKO) to the greatest extent possible, combined with implementations of closed form approximations providing a process by which engineers can maximize conducted EMI to USAF aircraft risk reduction with minimal test. Solutions should be general in nature; not limited or focused on one particular aircraft.
Technical POC: Dr. Michael Johnson, michael.johnson.10@us.af.mil, 850-882-0970

4.i **Title:** Test Data Delivery
Military System or Acquisition Customer: PEO Weapons, other MRTFB Test Customers
Description: Develop technologies to reduce transport time of test data from collection facilities to customers. New generation weapons and weapons platforms are generating tens to hundreds of gigabits of data per mission. It is critical to deliver that data, either processed or in raw form, to the customer immediately after a mission in order to make decisions concerning the next mission which is often the following day. The bottleneck in the transport process is the time associated with data encryption for data at rest. Transporting data on removable media such as a USB hard drive entails an encryption process that can take a full day for a 1TB drive. Reducing the time associated with encryption will allow rapid data delivery to customers and promote effective mission scheduling (e.g. had to cancel mission because of untimely data delivery).
Technical POC: Mr. Ken Crosby, kenneth.crosby@us.af.mil, 850-882-3154

4.j **Title:** Cell Phone Time, Space, Position Information (TSPI) Accuracy
Military System or Acquisition Customer: PEO Weapons, MRTFB Test Customers
Description: Improve cell phone TSPI accuracy for improved test and training execution and results. Increasingly, GPS location provided by cell phones is being used in tests and training exercises. These low-cost devices are providing an affordable alternative to traditional tracking devices. Uses include tracking

ground personnel, vehicles, and marine craft. Current accuracy levels provide sufficient TSPI for situational awareness and good targeting information but with improved location accuracy both test and training communities will have a better tool and opportunities for expanded use where better accuracy is required.
Technical POC: Mr. Ken Crosby, kenneth.crosby@us.af.mil, 850-882-3154

4.k **Title:** High Speed Aerial Missile Plume Simulator
Military System or Acquisition Customer: Aviation platforms, Aircraft Survivability, Army Program Manager – Aircraft Survivability
Description: Develop a solid state laser based missile plume simulator (MPS) that is small enough to install on a pod carried by a high speed aircraft (F-15). The MPS would be used to test missile warning receivers and countermeasures at operationally realistic altitudes and airspeeds. The MPS could also be used as a ground based simulator.
Technical POC: Mr. Michael Mazo, michael.mazo@us.af.mil, 850-882-2869

4.l **Title:** Centrally Operated Remote Tracking System (CORTS)
Military System or Acquisition Customer: PEO Weapons
Description: Existing instrumented ranges have inadequate coverage to provide realistic testing profiles to support long range/large footprint weapons testing. The Air Force is currently supporting the implementation of a Gulf Range Enhancement (GRE) project beginning in FY19 with Final Operational Capability (FOC) planned for FY29. GRE will provide agile test instrumentation and target presentation capability to support launches from the Florida Keys with impacts just off Eglin's coast or onto its land ranges. One requirement of this effort is to provide continuous radar coverage from point of launch to point of impact in order to evaluate weapon performance and to ensure safe operations. Development of new digital, mobile remotely operated tracking radars with fiber connectivity back to the Command and Control Facility (CCF) is critical along with the establishment of remote pads located at the Naval Air Station Key West and one in the St. Petersburg areas. The GRE program is not slated to begin the down range portion until FY25 behind the curve to meet many weapon system initial testing requirements. This development would accelerate the GRE program significantly providing a one-of-a-kind, National Test Asset designed for large footprint weapons and 5th Generation Fighter mission engagement scenarios.
Technical POC: Mr. James Webb, james.webb.2@us.af.mil, 850-882-1723

4.m **Title:** Remote Joint Terminal Attack Controller (JTAC) Targeting Capability
Military System or Acquisition Customer: PEO Weapons
Description: The 96TW can extend the effective range of Net-Enabled Weapons (JSOW-C1, SDB II) to improve precision targeting in GPS-contested environment. This can be accomplished by expanding the scope of existing Net-Enabled Weapon test tools which will increase test capability as well. Specifically, the Net-Enabled Weapon Real-Time Targeting Tool will integrate

Full Motion Video (FMV) with metadata as an input source to the existing tool. The tool can already generate NEW target updates via Link 16 J11.1 message. With this new FMV capability, test operations are improved by identifying target update errors in near-real-time prior to weapon launch.
Technical POC: Mr. Jason Lucas, jason.lucas@us.af.mil, 850-882-8028

4.n **Title:** Test Tool for Avionics and Weapons System Integration and Maintenance
Military System or Acquisition Customer: PEO Weapons, SOCOM PEO Fixed Wing, PEO Fighters/Bombers
Description: System wide instrumentation for aircraft maintenance that monitors multiple heterogeneous data streams (MIL-STD-1553, Ethernet, IEEE-1394) and includes network cable problem diagnosis capability. The expansion of its capability to multiple bus interface test capability with stimulation. This system will stream line maintenance by providing a single sustainable test fixture to address rapid fault isolation with Time Domain Reflectometer (TDR) and dynamic system operational assessment and prognostic tools. A prototype of the system is available, however the Air Force is interested in upgrading the software/hardware to accommodate USAF aircrafts and future smart weapons monitoring and maintenance. A model of this system is highly desirable to install onboard aircrafts for continuous monitoring and fault isolation.
Technical POC: Mr. Ramsey Sallman, ramsey.sallman@us.af.mil, 850-883-0537

4.o **Title:** Phoenix Missile Plume Simulator
Military System or Acquisition Customer: Large Aircraft Infrared Countermeasures Program
Description: Test and field the Phoenix two-color Infrared missile plume simulator. This missile plume simulator system is critical to the test and evaluation of missile warning systems and aircraft directed energy countermeasures systems. Current systems (fielded by the Center for Countermeasures) are at capacity with current workload.
Technical POC: Mr. Craig Deyerle, craig.deyerle.1@us.af.mil, 850-882-5493

4.p **Title:** Blue Force Denial and Deception Technology Employment
Military System or Acquisition Customer: Support applicable to entirety of fielded DoD forces
Description: Technologies, such as camouflage nets, paints, coatings, and decoys have the ability to effectively disrupt adversarial sensor detection and identification of weapon systems, facilities, and operations. We propose an inter-agency Operations-Intelligence working group to assess blue force denial and deception technology needs of the combatant commands. The Intelligence components of the working group should leverage existing denial and deception technologies to customize a full time solution for each geographic location.
Technical POC: Capt Michael Bellis, michael.belliss@us.af.mil, 950-882-7772, (Alt.) Mr. David Schoch, david.schoch.1.ctr@us.af.mil, 850-875-4871

5. **<u>Sponsor: PEO Battle Management</u>**

5.a Title: Massive Weather Data Rapid Transit

Description: Seeking innovative techniques to move large volumes of data, sometimes over unreliable and/or disadvantaged data links, in a continuous and reliable manner, and as quickly as possible. The Air Force Weather Enterprise requires and relies upon massive amounts of weather data, acquired and ingested from organic, DoD, national and allied terrestrial and space weather sensors and numerical weather modeling centers. Global and regional weather information is used in concert with numerical weather models to perform in-depth analysis and forecasting, resulting in the generation and dissemination of weather products supporting AF and Army operations around the world. Weather data is "highly perishable", as updated, more-relevant information are constantly being collected and received, ingested, and stored, then injected into weather models for which the resultant output is sent as products and/or data. This results in massive quantities of data (on the order of 50 TB per day) that is continually being ingested and disseminated, currently to and from a single physical AF location, via networks and satellite downlinks. The useful life span of much of this data and resulting products is on the order of minutes to hours; with a rapid degrade over that span to support weather situational awareness and forecasting operations. The sheer amount and size of data has made it unfeasible to date to develop a sufficiently capable alternate "Continuity of Operations" (COOP) location or to utilize distributed robust cloud computing environments - there simply is not a good way to rapidly, reliably and continually move copies of these large data sets to off-site locations. Innovative techniques are sought to move large volumes of data, sometimes over unreliable disadvantaged data links, in a continuous and reliable manner, and as quickly as possible. These techniques would significantly improve the availability of Air Force Weather operations, by supporting transport of key data to a COOP site, either an organic asset or a government cloud. Standing up this capability is essential for reducing risk to the Weather Enterprise while ensuring the operational performance of the AF weather mission for military operations. This capability is also vital for taking advantage of emerging cloud computing technologies within the DoD that offer both robust and highly affordable compute capability, as well as the potential for enhanced user performance via distributed worldwide cloud-based compute operations.

Technical POC: Ms. Teresa O'Donnell, teresa.odonnell.3@us.af.mil, 781-225-3481

The following PEO Battle Management topic descriptions are for Official Use Only (FOUO). These restricted descriptions will only be provided to interested U.S. Contractors pending submission and approval of a certified DD Form 2345 MILITARY CRITICAL TECHNICAL DATA AGREEMENT.

5.b Title: Rapid Low-Cost Test Automation for C2/ISR Applications

5.c Title: ISR Automated Data Fusion

5.d Title: Insider Threat Detection

If you would like to access the restricted FOUO topic descriptions, you must have a certified/approved DD Form 2345 and submit a formal request to the Air Force:

i) Go to Air Force Rapid Innovation Fund Submission Website: https://www.AFRapidInnovationFund.com
ii) Create an account in the system
iii) Use the request tool in the "View Solicitation and Related Documents" section to submit the request
iv) Upload a pdf copy of your certified/approved DD Form 2345
v) Verification of the certified/approved DD Form 2345 will take place (usually within three business days)
vi) Upon verification of the certified/approved DD Form 2345, you will receive an email notification and can log back into the Air Force Rapid Innovation Fund Submission Website to view the restricted FOUO topic descriptions

Please note: All restricted FOUO topic description requests must be made using the Air Force Rapid Innovation Fund Submission Website by 5:00pm ET on 26 April 2016. If you have any problems accessing the Air Force Rapid Innovation Fund Submission Website, please contact our system administrators at AFRIF@brtrc.com. If you have any questions regarding the topic request process, please contact Leonard Walton, AFLCMC/XZ, AF RIF PM, at leonard.walton@us.af.mil.

For information on the DD Form 2345 certification process, please contact the Defense Logistics Services Center at 74 Washington Avenue N., Battle Creek, Michigan 40917-3084 (1-800-352-3572) or reference http://www.dlis.dla.mil/JCP/#. Please allow up to 3 weeks for the certification processing time.

6. <u>Sponsor: PEO Business Enterprise Systems</u>

6.a **Title:** Managing Content Assembly

Military System or Acquisition Customer: SAF/AQXS

Description: Deploy software tool to develop unstructured "content" capability to facilitate rapid information discovery and agile content assembly across an enterprise information environment. "Content" is defined as semi-and/or un-structured data used across the Air Force, DoD, and other agencies, typically contained and organized in traditional document format (e.g., acquisition documents, contract documents, organizational data, engineering documents, etc.). The tool shall enable speedy information access for decision makers and content developers through content discovery, agile content assembly, and parallel processing. The tool must support content configuration control, on-demand information discovery, and content data analysis using a Service Oriented Architecture (SOA). This will assist the Air Force in transitioning from a legacy document-centric paradigm to an agile information environment focused on parallel content development and customized content assembly. The tool will prevent duplication of effort and misallocated labor hours associated with planning, tracking, reporting, and finding decisional information across the enterprise. This software development concept supports Air Force and DoD

future vision of accessing, manipulating, and assembling content across the information lifecycle versus managing traditional documents.
Technical POC: Mr. Lucas Bittick, lucas.bittick.1@us.af.mil, 937-257-9798

7. **Sponsor: PEO C3I & Network**

7.a **Title:** Advanced Data Analytics
Military System or Acquisition Customer: AF Network
Description: The solution shall utilize statistical, historical, and real-time analytic methods to detect correlated events and apply diagnostics to determine their causes and effects. By aggregating data from historical analysis, trending, real-time events, performance, and incidents on identified key cyber terrain, the Air Force can utilize predictive analysis techniques to support early adaptive responses across the cyber terrain. Solutions should include (1) preparation of the cyber terrain, (2) data management strategy, (3) data analytical methods, (4) data governance, and (5) data security. (DoD Focus Area 1).
Technical POC: Mr. Darin Leahy, darin.leahy@us.af.mil, 781-225-3477

7.b **Title:** Network Baselining
Military System or Acquisition Customer: AF Network
Description: In order to detect anomalous behavior in a network or system, one must first characterize what "normal" behavior is. The process of characterizing normal behavior is called baselining. The Air Force needs a tool that will connect to a cyber system or network, collect traffic and statistics, and determine a baseline of normal behavior on that system. The solution must then be able to monitor system usage, compare that to its calculated baseline, and detect when usage deviates from the norm. Normal behavior often consists of patterns which extend over periods of days, weeks, months, or even years. Since these patterns can develop over such long periods of time, the solution must be able to evolve its concept of normal behavior as it collects more data. The solution should not require significant changes to the system it monitors or alter that system's usage. It is not expected to take any actions to fix discovered anomalies; only inform an operator of the situation. It may also be advantageous for the solution to be able to take feedback from an operator concerning what is normal behavior and adjust its baseline accordingly. (DoD Focus Area 1).
Technical POC: Dr. Walter Greene, walter.greene.2@us.af.mil, 781-225-3442

7.c **Title:** Laser for Airborne Communications (LAC)
Military System or Acquisition Customer: Aviation Platforms – Aerial Networks/Comms
Description: Recent demonstrations of free-space optical (FSO) communications (Laser Communications) have shown markedly-increased accuracy, faster seeking and sustainment of distant FSO terminals to provide 10+ GBps Internet Protocol (IP) channels among distant aerial and fixed/mobile surface nodes. We are seeking near-term development, demonstration, and delivery of very-high throughput FSO technology for aerial layer networking and airborne tactical cloud communications among multiple airborne and mobile/fixed surface node

subscribers or gateways. LAC requires lab, field, and multiple-aircraft flight demonstration and qualification testing; provide 10+ Gbs throughput of bi-directional Internet Protocol (IP) network-capable traffic (e.g., VoIP, FMV, streaming content, large imagery/other-type file transfers, web services, text chat) among multiple air and surface (fixed and mobile) nodes. Provide means for effective point-to-point and point-to-multipoint connectivity with rapid/instantaneous acquisition, maintenance, and re-capture when laser beam is blocked by meteorlogical or terrain conditions. Demonstration (threshold) altitudes for air-to-air: threshold goal of 12,500 – 24,000 feet Mean Sea Level (MSL), with ranges 25-150 nautical miles (nm), 1Gbps connectivity air-to-surface and air-to-air at 100 nm. Objective air-to-air operations at 25,000 feet MSL and above (anticipate 35,000-45,000), with ranges of 200-250 nm or greater, 2-10+ Gbps air-to-air at 200 nm. Demonstration ranges for air-to-surface: 25-35 nm or greater; and objective goal for operations at 40-70 nm.
Technical POC: Dr. Bahareh Haji-Saeed, bahareh.haji-saeed.1@us.af.mil, 781-225-4143

The following PEO C3 & Network topic description is for Official Use Only (FOUO). This restricted description will only be provided to interested U.S. Contractors pending submission and approval of a certified DD Form 2345 MILITARY CRITICAL TECHNICAL DATA AGREEMENT.

7.d Title: High-Throughput High Frequency (HTHF) Assured Survivable Comms and Applications for Battle Management C2 (BMC2)

If you would like to access the restricted FOUO topic descriptions, you must have a certified/approved DD Form 2345 and submit a formal request to the Air Force:

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iv) Upload a pdf copy of your certified/approved DD Form 2345
v) Verification of the certified/approved DD Form 2345 will take place (usually within three business days)
vi) Upon verification of the certified/approved DD Form 2345, you will receive an email notification and can log back into the Air Force Rapid Innovation Fund Submission Website to view the restricted FOUO topic descriptions

Please note: All restricted FOUO topic description requests must be made using the Air Force Rapid Innovation Fund Submission Website by 5:00pm ET on 26 April 2016. If you have any problems accessing the Air Force Rapid Innovation Fund Submission Website, please contact our system administrators at AFRIF@brtrc.com. If you have any questions regarding the topic request process, please contact Leonard Walton, AFLCMC/XZ, AF RIF PM, at leonard.walton@us.af.mil.

For information on the DD Form 2345 certification process, please contact the Defense Logistics Services Center at 74 Washington Avenue N., Battle Creek, Michigan 40917-3084 (1-800-352-3572) or reference http://www.dlis.dla.mil/JCP/#. Please allow up to 3 weeks for the certification processing time.

8. <u>Sponsor: PEO Fighter/Bomber</u>

8.a **Title:** Structural Maintenance Data Analytics
Military System or Acquisition Customer: Aviation Platforms – All Platforms
Description: Seeking data management technologies to improve data interaction between maintenance communities and program offices. Venders should propose and develop a digital interface to efficiently collect maintenance data to include inspection results, leveraging current maintenance information systems, and communicate with existing data management systems in program offices. The tool would enable real time availability of maintenance data to increase the efficiency of the maintenance and program office communities.
Technical POC: Mr. Robert Pilarczyk, robert.pilarczyk@us.af.mil, 801-586-3155

8.b **Title:** Portable Mobile Device
Military System or Acquisition Customer: Aviation Platforms – All Platforms
Description: The United States Air Force requires a singular integrated mobile computer that can operate all the programs/applications utilized by the Logistics community. To this end, the vendor shall demonstrate a mobile/portable computer that is intrinsically safe, rugged, lightweight and portable, with wireless and/or cellular connectivity, has a "hot swappable" battery with an 8 hour minimum operating life under all operating conditions. The system must be able to allow USAF computer administrators to control updates and set user permissions. The device must be able to authenticate into the AFNET/DODIN. The device must be able to interface with and operate Standard Base Supply System (SBSS), Resources Management Information Systems (REMIS), Integrated Maintenance Data System (IMDS), GO81, Electronic Technical Information (ETIM), Integrated Management Information System (IMIS), Global Combat Support System (GCSS), Enterprise Supply System (ESS), Combat Ammunition System (CAS), and Cargo Movement Operations System (CMOS) programs. Additionally, the device must be able to display and access content in the following formats: JAVA, HTML5, Adobe, Flash player, Windows media and Office Suite. The device must be capable of authenticating into the AFNET/DODIN using a CAC card and user identification and password. The device must be able to interface with hand-held scanners. The device will be equipped with and able to interface with Radio Frequency ID (RFID) technology. The device must operate on 110-240 Volts and withstand extreme hot and cold operating environments.
Technical POC: Mr. Todd Engelman, todd.engelman@jsf.mil, 937-713-7418

8.c **Title:** Durable Materials for Low Observable Aircraft
Military System or Acquisition Customer: Aviation Platforms – B-2, F-22

Description: Seeking durable material solutions for composite Low Observable aircraft. The composite structure is frequently damaged by de-paint processes that are done for maintenance and depot operations. Damages may require repair of the composite or significantly complicate the re-application of paints and coatings. Coatings or materials resistant to sanding, dry media blast such as Wheat Starch (Type V) or Corn Starch/Polymer hybrid (Type VII) are desired.
Technical POC: Mr. Kevin Davis, kevin.davis.78@us.af.mil, 937-255-5429

8.d **Title:** Integrated Circuit Die Extraction and Reassembly
Military System or Acquisition Customer: Aviation Platforms – All Platforms
Description: Seeking technology to solve microcircuit (integrated circuit/chip - IC) obsolescence problem perpetuating across DOD services where the technology also improves IC reliability (heat rejection/heat tolerance/case strength, etc.) and provides a quick-reaction low-cost IC sourcing method. Such repackaged ICs will be suitable for high stress military applications for multiple uses including in-depot IC provisioning, and replenishment of obsolescent IC stocks that are affecting OEM manufacturing capability. Specifically interested in current or adaptable technology to perform IC die extraction and reassembly. Vendor will conduct full characterization testing of both the precursor and hermetic repackaged parts to demonstrate full MIL-STD-883 compliance with no degradation/drift occurring during the die extraction and repackaging processes. Testing will be over the full military temperature range when comparing precursor and repackaged part characterization test results, life test results etc. The contractor should describe their processes for finding die, testing for counterfeit/Trojan/used/bad parts, and mitigating cyber threats - malware proof, real time monitoring of hardware, firmware, BIOS, and core OS components. The contractor should also address reliability, schedule, and cost impacts compared to other mitigation strategies (e.g. circuit board redesigns, etc.). If successful this technology will benefit all current and future DOD weapon systems.
Technical POC: Mr. Jeffrey Sillart, jeffrey.sillart@us.af.mil, 937-713-6765

8.e **Title:** Miniaturization of High-Speed 1553 Network Interface Card for Rapid GPS M-Code Deployment on Airborne Weapon Systems
Military System or Acquisition Customer: Aviation Platforms – All Platforms
Description: All airborne weapon systems and munitions have been directed to transition to the new military GPS signal and information, called M-Code, to address significant non-kinetic threats to precision navigation and timing. All aircraft platforms must initialize weapons with the new M-Code signal information in a timely fashion prior to launch. The existing weapons interface databus based on MIL-STD-1553 does not have the throughput to initialize multiple weapons in a timely fashion. NATO STANAG 7221 addresses this issue by increasing the capacity of the 1553 bus by a hundredfold using advanced signal processing techniques. Network interface cards exist to integrate on the platform processor side of the bus for STANAG 7227 but too, there is a significant need for a miniaturized version of this interface to be integrated in air

to ground munitions. This requirement seeks the development and successful integration laboratory of such a network interface card for air to ground weapons (SDB-II, JDAM, JASSM) over the MIL-STD- 1760 weapons interface. Without this technology, the deployment of M-code will require significant cost and schedule investment in each airborne weapon system to integrate a new weapons interface bus and associated hardware and software.
Technical POC: Mr. William Urschel, william.urschel@us.af.mil, 937-713-7633

8.f **Title:** Cyber Security Knowledge Repository
Military System or Acquisition Customer: Aviation Platforms – All Platforms
Description: Seeking a tool to collect, analyze, manage and disseminate cyber threats, vulnerabilities, and mitigation strategies to approved personnel. The tool will automate the manual collection of information from a variety of feeds and provide analytic toolsets and algorithms to validate, organize, correlate, and manage the information. The data repository shall allow for the storage and categorization of lessons learned, capture best practices, intelligence activities reports, and cyber incident reports. Information will be released to individuals through a workflow approval process. Note: The objective of this effort is to identify patterns of adversarial behaviors and to distribute cyber defensive tactics and technologies across platforms within the AF Life Cycle Management Center (AFLCMC) Fighters and Bombers Directorate.
Technical POC: Capt Donald J.S. Alexandre II, donald.alexandre@us.af.mil, 937-713-7544

8.g **Title:** Cyber/RF Test and Countermeasures Tool Development
Military System or Acquisition Customer: Aviation Platforms – All Platforms
Description: Seeking a tool to identify and evaluate the defensive posture of critical onboard avionics communications and to perform vulnerability analysis of embedded systems. The objective of this effort is to identify and defeat the detected vulnerability within the given aircraft systems.
Technical POC: Capt Donald J.S. Alexandre II, donald.alexandre@us.af.mil, 937-713-7544

8.h **Title:** Cyber Resiliency Plan/Open Systems Architectures
Military System or Acquisition Customer: Aviation Platforms – All Platforms
Description: Seeking a tool to aid in the assessment of new and existing system acquisition program's cyber resiliency leading to improved mission assurance. The tool's decision aiding capabilities should support the inclusion of cyber resilience into systems and subsystems plans and designs throughout the acquisition life-cycle. The tool should support standard information standards, such as DoDAF and employ rigorous analysis techniques such as formal verification. Tool results will aid in the development of a Cyber Resiliency Plan (CRP). This is especially important with the DoD and USAF move towards open systems and COTS integration into future systems. Cyber resiliency assessments should address issues in system/subsystem redundancy, diversity and distributed functionality as methods for reducing risk and enable system/subsystem recovery

assuring performance of mission objectives. The tool and resulting CRP will provide both qualitative and quantitative information to assess the plan for the system's/subsystem's resiliency to cyber activity.
Technical POC: Capt Donald J.S. Alexandre II, donald.alexandre@us.af.mil, 937-713-7544

8.i **Title:** Wrapping Legacy Systems for Mitigating Vulnerabilities
Military System or Acquisition Customer: Aviation Platforms – All Platforms
Description: Our legacy systems may have vulnerabilities that need to be addressed in order to ensure secure operation of our weapon systems. Seeking solutions that will permit mitigation of these vulnerabilities through monitoring for anomalies exhibited by these systems during operation. Proposed solutions should permit a user to define what is monitored by the wrapper placed around the legacy system and then generate an appropriate wrapper to serve as real-time watchdog to not only monitor user defined requirements but mitigate any anomalies, if detected. Results of this effort will result in a demonstration of wrapper capability for a weapon system of interest. Benefits will accrue as a result of mitigation of vulnerabilities, known and unknown, as well extension of useful life, deferring the need to replace legacy system in the near term due to vulnerabilities.
Technical POC: Capt Donald J.S. Alexandre II, donald.alexandre@us.af.mil, 937-713-7544

8.j **Title:** Modular Approach to Adding Cooling Capability
Military System or Acquisition Customer: Aviation Platforms – All Platforms
Description: Seeking technologies to allow a modular approach to adding cooling capacity to electronic bays to match the thermal needs caused by incremental electronic component adds. Modular approaches are required to meet space and funding constraints. Increments of between 500 watts heat load to 15 kilowatts heat load should be considered in the modularity. Assume there will be no more than 2 improvements in any individual year. It is estimated that a 60% improvement in cooling capacity is needed over the next ten years. The current cooling capacity is 96 BTU/hr. If possible, modular improvements should contribute to the 10 year plan.
Technical POC: Mr. Aaron DeWitte, aaron.dewitte@us.af.mil, 937-713-7552

8.k **Title:** Low Observable, Point Inspection Tools
Military System or Acquisition Customer: Aviation Platforms – B-2, F-22
Description: Seeking novel Radio Frequency (RF) and optical characterization tools to improve the accuracy, precision, and/or speed of data collections including the measurement of RF defects in the electromagnetic near field and verification of material properties and/or scattering. Background: existing RF measurement technologies provide useful data but correlation to far field measurements is challenging. Additionally, automation of visual defect identification, quantification and data transfer has the potential to significantly reduce maintenance man hours and improve maintenance management.

Utilization of existing hardware and software infrastructures is highly desirable to maintain continuity and reduce cost. NOTE: Security protocols must be followed for Low Observable data collection. Contacting the TPOC is highly encouraged if offerors do not have experience with secure data systems.
Technical POC: Mr. Kevin Davis, kevin.davis.78@us.af.mil, 937-255-5429

8.l **Title:** Automation of Precision Low Observable Maintenance
Military System or Acquisition Customer: Aviation Platforms – B-2, F-22
Description: Background: The maintenance of Low Observable aircraft at the field level is tedious and time consuming. This is due to the precision necessary to restore structural and Low Observable characteristics back to the most advanced aircraft in the USAF fleet. We are seeking technologies for the automation of on-aircraft operations such as sanding, grinding, welding and machining. In addition, supporting capabilities such as precision scanning, measuring, and inspection systems are of interest. The goal is to utilize digitized data from scanning systems to expedite repairs performed on and off aircraft with higher precision and greater speed. NOTE: Security protocols must be followed for computer systems in secure areas. Contacting the TPOC is highly encouraged if offerors do not have experience with secure data systems.
Technical POC: Mr. Kevin Davis, kevin.davis.78@us.af.mil, 937-255-5429

9. <u>Sponsor: PEO ISR & SOF</u>

9.a **Title:** Multi-INT Assisted Target Recognition (ATR)
Military System or Acquisition Customer: Multi-INT Assisted Target Recognition (ATR)
Description: Seeking development and demonstration of an airborne autonomous sensor system capable of surveying an area of interest and providing annotated imagery or textual reports with location and identity of enemy targets and friendlies. The effort will co-align and rectify differing geo-coordinates as necessary on operational COTS/GOTS GEOINT sensors (Hyperspectral (HSI), Laser Radar (Lidar), and Electro-optical/Infrared (EO/IR) and combine with Radio Frequency Direction Finding (DF). The sensor/processing system will cross-cue sensors and correlated all data to realize a high Confidence level of Combat Identification (CID). This system will be flown to autonomously detect, track, identify, and geo-locate ground-based friendlies and enemy threats. The goal is to demonstrate a fully autonomous sensor system allowing >90% Combat ID for >20 vehicles (cars, trucks, tanks, TELS) with one medium altitude pass of the system
Technical POC: Maj Andrew Soine, andrew.soine@us.af.mil, 937-255-7535

9.b **Title:** Secure, Wireless Personal Area Network
Military System or Acquisition Customer: Battlefield Airman Program Office
Description: Seeking a secure battlefield wireless personal network for battlefield airman applications that minimizes size, power consumption, and detectable electronic signature. Capability must be compatible with existing serial port data rates and standard commercial wired interfaces. The proposed

solution must consider network and information security compliance with Air Force and National Institute of Standards and Technology (NIST) policies for wireless networks (Reference DoDI and NIST security controls.)
Technical POC: Mr. Johnny Jones, johnny.jones.3@us.af.mil, 937-656-8189

9.c **Title:** Improved Night Vision Capability for Battlefield Airmen (BA)
Military System or Acquisition Customer: Battlefield Airman Program Office
Description: Seeking an enhanced night vision capability for use on the battlefield. Current night vision goggles (NVGs) have poor performance under low light conditions and limited peripheral and vertical viewing capability. Opposing forces currently use NVGs with similar capabilities, so military advantage is diminished. The proposed solution must address a wide field of view and extended, useful portions of the electromagnetic spectrum for enhanced operations in darkness and reduced visibility conditions (ie, smoke, fog, rain). Incorporation of useful symbology from BA-worn computing and head-mounted orientation devices enhances tactical situational awareness. BA also requires equipment designed with reduced size, weight and power (SWaP) compared to current capabilities.
Technical POC: Mr. Todd Osborne, todd.osborne.3@us.af.mil, 937-656-8180

9.d **Title:** Advanced Cockpit Prototyping for RPA
Military System or Acquisition Customer: Medium Altitude UAS Division, Special Projects
Description: SOF-unique RPA programs lack the capability to rapidly prototype or integrate advanced cockpit designs and input devices (e.g. tablets, gaming controllers, etc.) to keep pace with related technologies in the commercial marketplace. Seeking innovative concepts to rapidly prototype advanced cockpit designs for currently fielded RPA, enabling significant reduction in aircrew workflow, thereby increasing their effectiveness. Proposed solutions should interface with or append to existing systems to the maximum extent possible, thereby ensuring concurrency with frequent operational software releases, while at the same time eliminating the need for multiple configurations of the baseline system. Remaining platform agnostic will allow this prototyping capability to be extensible to both new systems as well as future block upgrades of existing systems.
Technical POC: Mr. Oren Edwards, oren.edwards@us.af.mil, 937-255-2574

<u>Sub Sponsor: AF Special Operations Air Warfare Center (AFSOAWC)</u>

9.e **Title:** Multipurpose, Dynamically Allocated, Software Defined Conformal Radio Frequency Antenna Array
Military System or Acquisition Customer: Air Force Special Operations Command (AFSOC) airframes (AC-130, MC-130, U-28, CV-22); SOF AT&L PEO-FW
Description: Seeking an array of conformal antennas and a control system that can accommodate RF devices that transmit and receive between 3-30 MHz range (Band 1), 3MHz-3GHz range (Band 2), and 2-35 gigahertz (GHz) that is

controlled by a processor which can be connected to a variety of communication, e.g., RF aircraft survivability equipment, carry-on / carry-off radios and sensors, and other RF transmitters/receivers. Based on demand for RF apertures (band, power, direction), the processor will dynamically allocate conformal array capability and capacity in order to provide optimized transmission and receive antenna capability (to include beam forming, nulling, noise reduction, multiplexing and interferometry). This capability results in better antenna performance for current radio communications, RF geo-location systems, Radar Warning Receivers, as well as provides flexibility for future RF modifications and lower cost for future integration (antenna already in place), with reduced fuel costs due to reduced aerodynamic drag. The proposed solution shall provide a public application programming interface (API) that supports sensor management (configure, calibrate, etc.), tasking, and built-in test. System shall be able to resolve location for signals lasting no less than 2.5 seconds in duration from any direction. If system antennas are exposed, must be able to handle up to: 350 knot airspeeds at altitudes up to 28,000 feet, rain and other hazards associated with flying an aircraft, landing on unimproved runways. Conformal antenna arrays provide mission flexibility, increased fuel efficiency (by reduced drag), and lower mission signature by eliminating antenna element projections from the aircraft exterior.
Technical POC: Mr. Timothy E. Watts, timothy.watts.4@us.af.mil, 850-884-4611

9.f **Title:** Full Motion Video (FMV) Object Tracking
Military System or Acquisition Customer: Medium Altitude UAS Division, Special Projects, SOF GEOINT PED, MALET MQ-9
Description: Provide a capability to nominate and track multiple operator-selected objects in real time within an FMV or WAAS field-of-view (FOV) from manned and remotely piloted aircraft. The capability should be compatible with current EO/IR sensor data (i.e. SD, HD, 4K, etc.) and maintain the track through the following conditions: Static and moving targets, short periods of obscuration or out of the FOV, FOV transitions (e.g. from “Narrow” to “Ultra Narrow”), congested and high activity environments. Any overlay capabilities should be integrated with existing FMV viewers and be easily turned on/off. Capability should provide the ability to manually annotate the tracked objects and provide the ability to access and output track information through an API.
Technical POC: Mr. Lucas Medlock, lucas.medlock.2@us.af.mil, 850-884-2158

10. <u>Sponsor: PEO Joint Strike Fighter</u>

10.a **Title:** F-35 Improved Life Cycle Affordability
Military System or Acquisition Customer: PEO JSF
Description: F -35 desires maturation and transition of improvements that drive down life cycle cost. The first aspect of life cycle cost is production affordability. Therefore, improvements that drive down Unit Recurring Flyaway (URF) cost, production span time, or improve production quality for F-35 production are desired. The second aspect of life cycle cost is sustainment. Improvements are

desired that reduce sustainment cost by improving reliability or availability of components, reducing cost of spares, improving maintenance man hour requirements, reducing logistics footprint, avoidance of diminishing manufacturing sources, and other methods of life cycle cost reduction.
Technical POC: Ms. Amanda Gentry, amanda.gentry@jsf.mil

10.b **Title:** F-35 Follow on Development Maturation and Acceleration
Military System or Acquisition Customer: PEO JSF
Description: The first increment of F-35 Follow on Development includes major systems hardware and software upgrades as well as weapons modification. Desired projects are those which show clear technical risk reduction supporting already approved F-35 upgrade candidates, or reduce the cost/time/complexity of testing new software, hardware, or weapons release, leading to accelerated enhanced capability to the warfighter.
Technical POC: Ms. Amanda Gentry, amanda.gentry@jsf.mil

11. <u>Sponsor: PEO Space</u>
Sustaining technologically fresh national security space capabilities that are able to rapidly respond to emergent and known threats and also provide solutions that are agile, maneuverable and flexible, designed to operate with a resilient enterprise approach. Seeking technologies to maintain and enhance the strategic and tactical security advantages afforded to the U.S. by space, and energize the space industrial base supporting U.S. national security.
Technical POC for all PEO Space requirements: Capt. Kyle Knight, kyle.knight.2@us.af.mil, 310-653-9183

11.a **Title:** Enterprise Ground Service Applications and Resilient Space Enterprise
Description: Devise enterprise wide services/applications that will allow real-time exfiltration of tactical user selectable satellite TT&C data for autonomous decision making; Experiments, prototypes and demonstrations that enable a more agile, resilient space enterprise

11.b **Title:** Improved Data Fusion Algorithms for Space Based Missile Warning, Missile Defense, and Battle Space Awareness
Description: Improved and automated data fusion algorithms and techniques for detection, tracking, characterization, and discrimination for space-based remote sensing using SBIRs wideband data for missile warning, missile defense, and battlespace awareness; Multi-Intelligence Data Fusion (OPIR, Terrestrial Weather, Space Environment, Radars, etc.) for improvement of feature extraction, target discrimination, tracking and detection generating decision-quality actionable products for strategic and theater applications

11.c **Title:** Improved Automated Analytic Techniques for Characterization and Discrimination for Space-Based Missile Warning, Missile Defense, and Battle Space Awareness

11.d **Title:** Develop and Prototype a Sensor for Space-Based Missile Warning, Missile Defense, and Battle Space Awareness
Description: Develop and prototype a low size, weight, power, and cost sensor for characterizing the local energetic charged particle environment of the host spacecraft for the purpose of aiding space vehicle anomaly assessment; Deploy radio beacon receiver plugins to receive three tones from COSMIC-2 satellites and develop data exploitation algorithms for mitigating satellite communication anomalies and to identify communication windows of opportunity; Develop non-traditional techniques and alternate phenomenologies to retrieve ocean wind speed and direction from space-borne sensors

11.e **Title:** Data Exploitation Techniques (DET) and Algorithm Development
Description: DET and algorithm development for identification of weather features within Overhead Persistent Infrared satellite data coupled with a neural network expert system and potentially other data sources to identify boundaries, altitude, state variables, and depth

11.f **Title:** Increased Persistence of Space-Based Intelligence, Surveillance and Reconnaissance (ISR)
Description: Develop innovative concepts, methods and techniques to increase persistence of spaced-based intelligence, surveillance and reconnaissance to expand the utility of sensing systems beyond traditional applications

11.g **Title:** Enhanced Space Situational Awareness (SSA) including: Data Processing, Cross-Cueing, Debris Detection, Custody Maintenance & Conjunction Prediction

11.h **Title:** Technologies to Increase Resiliency of Space Infrastructure
Description: Laser hardening (focal plane arrays, optics, ROICs, solar arrays) and Cyber hardening (cyber resilience and cyber security

11.i **Title:** Technologies to Increase Cross-Domain Capabilities to Enhance Resilience
Description: Crosslinks (especially laser, high data rates)

11.j **Title:** Increased Autonomy for Command and Control (C2) Systems to Increase Resiliency and Reduce Manning
Description: Tools to direct the actions/tactics and protect space assets

11.k **Title**: Technologies Enabling Highly Efficient On-Orbit Maneuvers & Longer On-Orbit Lif**e**
Description: None provided.

11.l **Title:** User-Friendly Interfaces Providing Space Capabilities for Theater Commands

11.m **Title:** Enable Multiple Simultaneous Contacts to Reduce Logistics Tail of Satellite and Ground Operations

11.n **Title:** Components and Interfaces for Satellite Buses and for Satellite Buses and Payloads
Description: Standardized and Miniaturized Components; Reduce costs and improve performance of satellite buses, payload and components; Touch Labor Reduction; Lighter Weight components; Component size manufacturing process; and Advanced materials/processes ready for component manufacturing demonstration

11.o **Title:** Improved Tools for Design and Testing of Components and Systems

11.p **Title:** Advanced Photonics, Quantum and Carbon Electronics and Improved Key Building Blocks for Future Responsive Space Systems

11.q **Title:** Affordable Expendable Launch Vehicle and Propulsion
Description: Expendable vehicle and propulsion technologies are being sought that embody "best value" by balancing system performance vs. cost. For serious contention, any best value strategy will need to be able to perform at existing levels of space launch system reliability. Cost metrics will need to factor both development and recurring cost. Vehicle/propulsion system characteristics published in the submission will necessitate a companion preliminary commercialization strategy, which the government will use to gauge the system's realistic competitive commercial market capture potential. Best value vehicle/propulsion factors to consider include: Architecture/ demonstration strategy, considering small, medium, intermediate, and large payloads; Limit upper stage use to Low Earth Orbit (LEO) injection, relying instead on emerging payloads using high power solar electric spacecraft propulsion for higher energy orbit transfer/insertion; Ground infrastructure; Stage/engine modularity, commonality, and/or interoperability; Technology scalability; and Commercialization strategy, assuming a time-phased development/operations enterprise where initial government investment is followed by industry investment

11.r **Title:** Affordable Manufacturing for Expendable Space Launch
Description: This topic will consider two technology insertion paths. The first path will consider affordable manufacturing technology that would benefit exiting space launch system providers. The second path will consider affordable manufacturing technology for future launch system risk reduction. This path can be proposed individually or in concert with another company pursuing affordable launch system development. If another company is involved, a letter of cooperation must be presented in the submission package. The following affordable manufacturing technologies are of interest (both paths): Touch labor reduction; Lighter-weight components; Composite tank cryogenic propellant

compatibility; Component size manufacturing process scalability; and Advanced materials/processes ready for component manufacturing demonstration

11.s **Title:** Space Situational Awareness (SSA) - Characterization of Kinetic and Non-Kinetic Threats
Description: Developing improved tools and methods for fusing multi-variant intelligence and SSA data to support kinetic and non-kinetic threat characterization. This capability should increase U.S. understanding and confidence-levels associated with the intent of non-cooperative space operators. Develop automated algorithms for recognizing and assessing threat characteristics in the context of real-time alerts to U.S. operators if a non-cooperative space asset could threaten U.S. forces, along with an understanding of the relevant facts and Courses of Action which the Joint Space Operations Center (JSpOC) should consider.

11.t **Title:** Space Situational Awareness (SSA) - Data Integration and Exploitation
Description: Developing information technology to manage/integrate threat attributes, real-time intelligence, updates to threat folder across classification levels (moving downward low data on higher networks and/or cleansing high data on high networks so it can be synthesized at lower classification levels). Develop S&T methods for enhanced collaboration between JSpOC/USV, JICSpOC, NASIC, NSA and AF Targeting Center to achieve rapid threat folder.

11.u **Title:** Space Situational Awareness (SSA) - Threat Warning and Assessment
Description: Develop patterns of life across big data sets at multiple classification levels to establish relevant and timely indications and warnings of hostile or threatening actions by non-cooperative space forces. S&T needs to focus on establishing a strong model for attributes required to be stored and trended. S&T should also focus on suite of algorithms that can continuously mine, learn, and un-learn patterns from multiple levels to establish "normal peacetime" and "crisis time patterns" in real time.

12. <u>Sponsor: PEO Strategic Systems</u>

12.a **Title:** ICBM Battery
Military System or Acquisition Customer: Various Weapons Platforms
Description: Seeking high quality, easily manufacture-able battery or other energy storage device capable of being stored for extended periods of time (20 – 30 years) without maintenance. Applications range from relatively small form factors capable of short discharges near 100C and 1 kilowatt, to larger form factors capable of constant discharges near 10C and a few kilowatts, with even higher discharge spikes, all the while meeting stringent environmental requirements and having the same or less volume/mass than current squib-activated batteries. A technology that could meet these requirements could have uses in other Air Force munitions and aircraft that have emergency or reserve power requirements. Flexible or modular designs capable of meeting a variety of applications, with differing voltage, power and capacity needs, would be highly

desirable for current and future ICBM applications. (i.e. Re-entry Vehicle, Flight Control Unit, Missile Guidance Set batteries).
Technical POC: Mr. Nathan Whipple, nathan.whipple@us.af.mil, 801-777-4243

12.b **Title:** Networked Radio Frequency Positioning, Navigation, and Timing
Military System or Acquisition Customer: Air Force Strategic Systems
Description: Develop and leverage communication links to provide accurate position and time data to users in GPS-contested environments. Exploit software based approaches to use existing hardware resulting in GPS-level position accuracy and the ability to locate non-cooperative transmitters during GPS degradation or denial. This topic is of joint interest to AFPEO/SS, ACC, and AFSPC.
Technical POC: Mr. Stephen Forbes, stephen.forbes@us.af.mil, 505-846-7890

12.c **Title:** High Performance Rotational Acceleration Sensors
Military System or Acquisition Customer: Air Force Strategic Systems
Description: Develop very low Size, Weight and Power (SWaP) profile gyroscopes to provide strategic-grade accuracy, extended mean time between failures (MTBF), radiation-hardened design capabilities, and affordable predicted production costs. Leverage state-of-the-art solid state technologies to provide commonality across strategic systems where practical. This topic is of joint interest to AFPEO/SS, ACC, and AFSPC.
Technical POC: Mr. Adam Reinelt, adam.reinelt.1@us.af.mil, 505-853-4433

12.d **Title:** High Performance Linear Acceleration Sensors
Military System or Acquisition Customer: Air Force Strategic Systems
Description: Develop very low Size, Weight and Power (SWaP) profile accelerometers to provide strategic-grade accuracy, extended mean time between failures (MTBF), radiation-hardened design capabilities, and affordable predicted production costs. Leverage state-of-the-art solid state technologies to provide commonality across strategic systems where practical. This topic is of joint interest to AFPEO/SS, ACC, and AFSPC.
Technical POC: Mr. Adam Reinelt, adam.reinelt.1@us.af.mil, 505-853-4433

12.e **Title:** High Performance Inertial Measurement Units
Military System or Acquisition Customer: Air Force Strategic Systems
Description: Develop very low Size, Weight and Power (SWaP) profile inertial measurement units to provide strategic-grade accuracy, extended mean time between failures (MTBF), radiation-hardened design capabilities, and affordable predicted production costs. Leverage state-of-the-art solid state technologies to provide commonality across strategic systems where practical. This topic is of joint interest to AFPEO/SS, ACC, and AFSPC.
Technical POC: Mr. Adam Reinelt, adam.reinelt.1@us.af.mil, 505-853-4433

12.f **Title:** High Performance Optical Star-Tracker Systems

Military System or Acquisition Customer: Air Force Strategic Systems, DoD, Spacecraft Bus Systems
Description: Develop optical star-tracker systems for multi-platform navigation applications, including position fixing for manned and unmanned weapon systems operating in degraded/denied GPS coverage areas, or when purely internal unaided navigation solutions are required. Leverage emerging solid-state optics technologies to reduce size, weight, and power (SWaP) and increase accuracy to enable integration into weapon systems requiring a smaller form factor or higher accuracy that currently available.
Technical POC: Mr. Stephen Forbes, stephen.forbes@us.af.mil, 505-846-7890

13. <u>Sponsor: PEO Weapons</u>

13.a **Title:** Denied Area Technologies
Description: Seeking innovative technologies to improve operational system performance in any of the following areas but not limited to: Enhance position, navigation, and timing (PNT) accuracies (high performance Anti-Jam GPS, Non/GPS/alternate navigation approaches such as celestial navigation). Improve precision targeting/delivery in GPS-contested environments (such as IMU and timing sources). Prevent exploitation of systems lost in denied areas (anti-tamper). Extend the effective range of weapons (including propulsion efficiency, aerodynamic improvements, weight reduction, etc.).
Technical POC: Mr. Russell Klug, russell.klug@us.af.mil, 850-883-2137, (Alt.) Mr. Greg Barnette, gregory.barnette@us.af.mil, 850-883-5908

13.b **Title:** Improved Target Prosecution Technologies
Description: Seeking technologies in any of the following areas but not limited to: Enhance target recognition (sensor sensitivity, sensor fusion, target identification/ATR). Broaden the target set (reduced collateral damage, enhanced lethality, enhanced access and penetration for non-kinetic solutions). Improve fusing capabilities/producibility (survivability, height-of-burst (HOB) performance, fusing location/target vulnerability detection, universal digital interface). Real-time data link execution and planning, and other associated innovations. Enhance weaponeering tools to improve fidelity and/or reduce workload. Enable replacement of cluster bombs while maintaining an area attack capability.
Technical POC: Mr. Russell Klug, russell.klug@us.af.mil, 850-883-2137, (Alt.) Mr. Greg Barnette, gregory.barnette@us.af.mil, 850-883-5908

13.c **Title:** Improved Weapon Performance and Effectiveness
Description: Seeking technologies in any of the following areas but not limited to: Cockpit selectable weapon characteristics in real time before and positive control after weapon release/employment. Cockpit adjustable warhead effects to optimize lethality and control collateral damage (fragmentation and blast energetics). Enhance energetics/explosives including structural energetics and increase energy density. Enhance weapons effects including increased fragmentation and control, novel payloads/kill mechanisms and penetration

improvement technologies. Multiple weapons effects through integration of weapon datalink or net-enabled capability to do coordinated time-of-arrival or in-flight selection of common azimuth/elevation and/or precision fusing selection for multiple weapons delivery.
Technical POC: Mr. Russell Klug, russell.klug@us.af.mil, 850-883-2137, (Alt.) Mr. Greg Barnette, gregory.barnette@us.af.mil, 850-883-5908

13.d **Title:** Improved Weapon Affordability/Cost Reduction
Description: Seeking novel technologies and solutions to drive down the cost per unit on legacy weapon modifications and future weapons procurement, throughout the system's lifecycle. Additionally, seeking to employ innovative, low-cost technologies under the Air Force's "Bending The Cost Curve" initiative for future weapons platforms under the Denied Area Technology, Improved Target Prosecution Technology, and Improved Weapon Performance and Effectiveness thrust areas. Areas of interest include but are not limited to: low-cost materials, low-cost navigation and guidance solutions, and addressing universal armament interface (UAI) compliance concerns in early design phase, and low-cost technologies to ensure systems security (cyber-resilience).
Technical POC: Mr. Russell Klug, russell.klug@us.af.mil, 850-883-2137, (Alt.) Mr. Greg Barnette, gregory.barnette@us.af.mil, 850-883-5908

14. <u>Sponsor: Propulsion Directorate</u>

14.a **Title:** Aircraft Engine Sustainment Technologies
Description: Advanced technologies and applications are sought which will reduce the cost and time associated with Air Force aircraft turbine engine sustainment. Technologies are sought in the following areas: non-destructive inspection, additive repair, component usage extension, airfoil sustainment, improved plating or thermal spray processes, high temperature special technology coating sustainment, augmenter design methodology, integrally bladed disk sustainment, engine health management, and fuel burn reduction.
Technical POC: Mr. John Horst, john.horst.1@us.af.mil, 937-255-7988

14.b **Title:** Maintenance Optimization Software
Description: Software is sought that will optimize the work scope of tasks performed by engine maintainers to lower overall maintenance cost and improve time on wing by taking into account the reliability of the engine components, the life cycle costs of maintaining the engine, and other factors that affect the overall cost of engine maintenance and time on wing.
Technical POC: Mr. Mike Metzger, michael.metzger.5@us.af.mil, 405-734-4014

13.5 Office of the Secretary of Defense (OSD)/ Defense Agencies Annex:

Points of Contact:

General or administrative questions should be addressed to questions@dodrif.com

Questions regarding specific OSD/Defense Agency requirement areas should be addressed to the Technical Point of Contact (POC) listed under each of the below requirements.

Specific Instructions: None

OSD / Defense Agency FY2016 RIF Requirements:

United States Africa Command (USAFRICOM) / U.S. Army Africa (USARAF)

Requirement #: AFRICOM-16-BAA-RIF-0001
Title: Drone-enabled Site Surveys
Military System or Acquisition Customer: US Army Corps of Engineers, Engineer Research and Development Center *(*ERDC*)*
Description: Site surveys must be conducted for all contingency and non-contingency bases to determine the capability of the site to be used for forces, develop construction plans, and identify environmental concerns that can lead to health hazards. USARAF lacks drone technology to conduct these site surveys to develop engineering products in the field where immediate access to up-to-date geospatial data is not available or limited, or to enhance/update geospatial data to contribute to its database. Proposed solutions must be commercially transportable, maintainable and usable by small site survey teams in Africa. Data from drone-enabled surveys must be easily shareable with and usable by common environmental baseline survey tools.
Technical POC: MAJ Rosier Strimel, +39 444-66-1562, rosier.e.strimel.mil@mail.mil

Requirement #: AFRICOM-16-BAA-RIF-0002
Title: Medical Informatics and Telemedicine in Africa
Military System or Acquisition Customer: Joint Program Executive Office - Health Systems
Description: Access to trauma and emergency medicine in Africa is extremely limited. The absence of local infrastructure, even in developed areas, place personnel at risk when operating on the continent. Commanders assume risk and must plan for treatment and stabilization of casualties for up to 96 hours while they await evacuation to definitive care. This leads to the potential for increased and potentially preventable mortality rates for personnel operating in Africa. There is an inability to leverage a global network of medical professionals that can provide expert advice to personnel in remote locations, and reduce the need for a larger medical footprint. There is also an inability to document patient information and tracking, regardless of location and platform, without a lot of equipment. Envisioned solutions involve technologies to enable U.S. or European-based trauma/surgical teams (surgeon, nurse, anesthetist, etc.) to monitor, advise, oversee and/or perform real-time resuscitative surgery, trauma care, and en-route car and/or a small, transportable, and self-contained intensive care unit/bed/litter connected

(via satellite or other means) to Role IV care to continue medical support during patient evacuation.
Technical POC: MAJ Rosier Strimel, +39 444-66-1562, rosier.e.strimel.mil@mail.mil

Requirement #: AFRICOM-16-BAA-RIF-0003
Title: Security Cooperation Program Assessment Tool
Military System or Acquisition Customer: DISA (currently contracted internal to Command)
Description: USAFRICOM desires a Google Earth-accessible common operational picture (COP) tool that can provide assessments of theater campaign plan lines of efforts, objectives and operational assessments. Capability would ideally be web-based; allow for trend and historical snapshot analysis going back 2 years; account for English, French, Arabic, and Hausa social media (Facebook, Twitter, Instagram, etc) feeds into the assessments via non-attributable methods; allow for data to be exported to Microsoft Excel or csv so that it can be imported into Tableau or Arc-GIS.
Technical POC: C. Van Anderson, +49-711-729-7921, christen.v.anderson4.civ@mail.mil

Chief Information Officer / Defense Information Systems Agency (CIO / DISA)

Requirement #: CIO_DISA-16-BAA-RIF-0001
Title: Transport Layer Security (TLS) Inspection
Military System or Acquisition Customer: Defense Information Systems Agency Cyber Security Office
Description: Demonstrate a scalable approach for the inspection of encrypted traffic and potential blocking of Transport Layer Security (TLS) encrypted web traffic without requiring man-in-the middle brokering of multiple Transmission Control Protocol (TCP) sessions or persistent storage of shared digital certificates. For throughput purposes, the demonstrated capability should enable a single TCP session between initiating client and terminating server with the ability to insert arbitrary inline devices, each with visibility into the unencrypted payload. These devices will then be capable of inspecting the unencrypted communication for purposes such as but not limited to Data Loss Prevention (DLP) or Intrusion Detection Prevention Systems (IDPS). Mutual authentication should be supported as well as session key management enabling perfect forward secrecy. Approaches should not necessarily be bound by current protocol conventions and may include multiparty key exchange protocols.
Technical POC: John Mills, 703-695-0906, john.r.mills28.civ@mail.mil or Erin Maultsby, 301-225-9451, erin.j.maultsby.civ@mail.mil

Requirement #: CIO_DISA-16-BAA-RIF-0002
Title: Managed Cyber Intelligence as a Service
Military System or Acquisition Customer: Defense Information Systems Agency Cyber Security Office
Description: Cyber intelligence is mission essential in providing situational awareness of the battlespace in the cyber domain. Cyber Intelligence is defined as evidence-based knowledge, including context, mechanisms, indicators, implications and actionable advice about existing or emerging menace or hazard to assets that can be used to inform decisions makers regarding the response to mitigate that menace or hazard. To support this requirement, the DoD requires

mature technologies to manage private sector Cyber intelligence as a service as a supplement to formal DoD intelligence reporting.
Technical POC: John Mills, 703-695-0906, john.r.mills28.civ@mail.mil or Erin Maultsby, 301-225-9451, erin.j.maultsby.civ@mail.mil

Requirement #: CIO_DISA-16-BAA-RIF-0003
Title: Credential Misuse Detection
Military System or Acquisition Customer: Defense Information Systems Agency Cyber Security Office
Description: The Credential Misuse Detection capability would provide a solution that automates the detection of lateral movement, unusual use of legitimate credentials, multiple simultaneous logins, etc. The technical solution must demonstrate effectiveness, reliability, scalability, an intuitive user interface, and also integrate with Cyber Situation Awareness Analytics Capabilities on the Big Data Platform.
Technical POC: John Mills, 703-695-0906, john.r.mills28.civ@mail.mil or Erin Maultsby, 301-225-9451, erin.j.maultsby.civ@mail.mil

Combat Terrorism Technical Support Office (CTTSO)

Requirement #: CTTSO-16-BAA-RIF-0001
Title: Separation Technology for Unique DNA and Protein Markers from Multiple Subjects
Military System or Acquisition Customer: Defense Forensic Science Center
Description: Develop validated forensic procedures using Next Generation DNA sequencing which can separate and analyze biological evidence containing DNA from up to ten different persons. The developed procedures should expand upon current short tandem repeat (STR) deconvolution methodologies and focus on deconvolution of statistically relevant single nucleotide polymorphism (SNP) loci, Y chromosomal short tandem repeats, mitochondrial DNA, and selected protein markers. Algorithms should be developed in conjunction with these protocols that analyze the results and provide individual identifying profiles of the donors in the mixed sample of evidence. Deliverable shall be able to operate independently without reliance on proprietary bioinformatics.
Technical POC: Samuel Henderson, Samuel.Henderson.ctr@cttso.gov

Requirement #: CTTSO-16-BAA-RIF-0002
Title: Portable Petroleum Identification Device (Fuel Authentication)
Military System or Acquisition Customer: USSOCOM
Description: Develop a field portable analytical device capable of identifying the source of petroleum products for fuel authentication purposes. The system shall weigh no greater than 30 pounds; have a low power draw to run off of vehicle supply; contain library of fuel signatures from wells in the ISIL region of operations; have a graphical user interface providing yes/no authentication of source with a further capability to send full spectral information to a reach-back source; time for system warm up shall be no longer than 10 minutes; and single sample analysis of crude oil samples shall take no longer than 10 minutes.
Technical POC: Dr. Christina Baxter, Christina.Baxter@cttso.gov

Requirement #: CTTSO-16-BAA-RIF-0003
Title: Speech Technologies in Tracking, Targeting, and Locating in Noisy Environment
Military System or Acquisition Customer: USSOCOM
Description: CTTSO is seeking innovative speech technologies for tracking targeting and locating in noisy environments. The technology needs to filter relevant information for in-theater decision makers. In addition, the capabilities need to be integrated into light platforms in support of operators on the move handling a variety of noisy audio channels. The technologies need to provide near real-time situational awareness of incoming signals, filtering speakers, messages, languages, and location.
Technical POC: Dr. Kathleen Egan, Kathleen.Egan@cttso.gov

Defense Logistics Agency (DLA)

Requirement #: DLA-16-BAA-RIF-0001
Title: Supply Chain Protection: Detecting the Insertion of Sub-Standard Materials, Components, or Sub-Components
Military Systems or Acquisition Program Customer: DLA Weapon System Program Managers, DoD Services Logistics Managers & Logistics Activities
Description: Develop and demonstrate technology that is applicable across the majority of Class IX parts that DLA buys and can detect the insertion of sub-standard raw materials, components, or sub-components into the supply chain. The technology should be affordable and be able to detect insertions higher tier vendors would miss. Establish methods to identify compromised parts and prevent them from being used in DoD weapon systems. A single low cost anti-counterfeiting technology that can authenticate items in multiple Federal Supply Classes (FSCs) is strongly preferred. At a minimum, the technology must be effective in preventing counterfeits by authenticating items in all of the following FSCs:

a) FSC 5961 Semiconductor Devices
b) FSC 5962 Microcircuits
c) FSC 5935 Electrical Connectors
d) FSC 4730 Fittings Hose, Pipe and Tube
e) FSC 3110 Bearings, Anti-friction, Unmounted
f) FSC 3120 Bearings, Plain, Unmounted
g) FSC 2530 Vehicle Brake, Steer Axle, Wheel and Track Components
h) FSC 2940 Engine Air and Oil Filters, Non-Aircraft
i) FSC 2910 Engine Fuel System Components Non-Aircraft
j) FSC 1680 Miscellaneous Aircraft Accessories and Components
k) FSC 5330 Gaskets
l) FSC 5331 O-Rings

This proposal must detail how the technical solution will be integrated into the supply chains of DLA suppliers, the impact on the supply chains of implementing the technical solution, and the probability that DLA supply chains will adopt the technical solution. Note: This supports an OSD/Logistics Management and Readiness priority to prevent counterfeit materiel in supply chains.
Technical POC: Art Beauchamp, 703-767-1928, arthur.beauchamp@dla.mil

Requirement #: DLA-16-BAA-RIF-0002
Title: Detecting Markings on Technical Data to Identify Controlled Data
Military Systems or Acquisition Program Customer: DLA Logistics Operations and Services' Engineering Support Activities & Product Data Management Program
Description: DLA receives and stores a large amount product technical data assembled into Technical Data Packages (TDPs) used to acquire items for Services to sustain their weapons systems. The data is marked to indicate distribution restrictions (distribution statements, export control, proprietary, etc.). The TDPs are stored as electronic files. The accumulated files contain duplications and variations. Also, the files have evolved from simple raster images to files supporting advanced design and manufacturing (e.g., 3-dimensional solid model data). Regardless of the file type, distribution restrictions must be discernable and enforced. Additionally, a TDP must be recognized for its most restrictive distribution statement derived from its pieces. DLA must ensure that technical data is protected from inadvertent distribution while sharing it to the maximum extent possible to facilitate efficient use of resources. We seek technology that can search technical data, recognize markings, and relate characteristics to identify properly marked data, mismarked data, and duplicate data. Note: This support a DoD-wide initiative to improve the safety and security of supply chain operations.
Technical POC: Stephen Rodock, 703-767-5059, stephen.rodock@dla.mil

Requirement #: DLA-16-BAA-RIF-0003
Title: Secure Supply Chain Parts Tracking
Military Systems or Acquisition Program Customer: DLA Logistics Operations and Military Services & Product Data Management Program
Description: According to the Government Accountability Office (GAO), DoD is not effectively tracking all of its parts with unique identification. DLA seeks the transition and implementation of a viable item tracking and item data management system that provides supply chain security, item visibility, as well as item data management. The solution must be able to track individual items throughout the supply chain and across a wide range of Federal Supply Classes. The solution must support the requirements of DFARS Clause 252.211-7003 *"Item Identification and Valuation."* Note: This supports a DoD-wide initiative to improve the safety and security of supply chain operations.
Technical POC: Art Beauchamp, 703-767-1928, arthur.beauchamp@dla.mil

Defense Threat Reduction Agency (DTRA)

Requirement #: DTRA-16-BAA-RIF-0001
Title: Low-Cost Replacement for High-Efficiency Neutron Detectors Based on Very High-Pressurized He-3 Tubes in Military Systems
Military System or Acquisition Program Customer: Military Systems: Nuclear search & characterization assets, Portable radiation monitors (Backpacks, Handhelds), Fission detectors, Small size-weight-power detectors, wide-area deployment detectors. Customers: DTRA Technical Support Group (TSG), the 20th SUPCOM, USSOCOM, Defense Intelligence Agency,

Joint Project Manager - Radiological & Nuclear Defense for JPEO-CBD, Homeland Security applications, Neutron Science/Detection Community
Description: Following the on-going execution of the RIF FY13 topic, "Neutron Detectors for Direct Replacement of He-3 Tubes in Military Systems", it has been concluded that direct replacement using 1"- or 2"- diameter boron-coated straw tubes is unlikely to meet the sensitivity of some of the military search and localization assets historically based on very high pressure He-3 tubes, e.g., 10-atmospheres to 20-atmospheres. While these military assets are mission critical, replacement with gaseous He-3 tube today is cost prohibitive. It is imperative to utilize other low-cost, enabling He-3 replacement technologies DTRA developed in the past that specifically targeted toward high sensitivity neutron detection applications. These technologies can either be confined in tube configuration still meeting the high sensitivity desired or in some cases a brand new design with similar form factor for even better sensitivity. They can be packaged within the geometry of the existing military systems they are intended to replace. The detector shall demonstrate detection efficiency at least equivalent to that of high-pressure He-3 tubes in the military systems. Significant performance benefits over He-3 tubes will also be demonstrated, including no pressurization, lower power consumption, larger/faster signals, and lower cost electronics.
Technical POC: Dr. Hank Zhu, 703-767-7655, Hongguo.zhu.civ@mail.mil

Requirement #: DTRA-16-BAA-RIF-0002
Title: Blast Through Blast Doors (BTBD) Weaponeering Software
Military System or Acquisition Program Customer: Military Weapons of Mass Destruction (WMD) defeat weaponeers using the JMEM Weaponeering System (JWS), the Integrated Munitions Effects Assessment (IMEA) Modeling and Simulation planning tool, or the Targeting Application Workstation (TAW).
Description: Deliver and integrate a unified model for damage to blast doors and the lethal environment beyond any failing blast door from any loading regime to enhance CWMD planning tools. This effort will leverage the experimental and computational data gained from recent efforts for weapons very close to blast doors (where breaching dominates), historical data and models for weapons far from blast doors (where bending dominates), and data and analysis from other recent efforts at transitional distances (where the two phenomena combine). Augment these data sets with additional scaled testing as needed to develop, calibrate and validate the comprehensive blast through blast door model and integrate the model into the IMEA planning tool.
Technical POC: Mr. Henry Marcinowski, 703-767-2358, henry.f.marcinowski.civ@mail.mil

Requirement #: DTRA-16-BAA-RIF-0003
Title: Autonomous Search Capabilities for Radiological/Nuclear Materials (DTRA)
Military System or Acquisition Program Customer: SOCOM, JPM RND, DTRA Technical Support Group
Description: Develop technologies and capabilities to perform autonomous building searches for radiological and nuclear materials, including advanced search algorithms and hardware integration of sensors. Search should employ off-the-shelf compact radiation detectors (e.g. CZT, NaI/CsI with SiPM, solid-state neutron detectors) with unmanned ground or air vehicles and operate with autonomous path planning and navigation. Possible solution could include multiple cooperative vehicles with a heterogeneous set of sensors. Considerations for an

effective search include: speed of search, accurate identification of radiological/nuclear material presence, optimized noise signature, and ability to adapt to unknown building layouts.
Technical POC: Dave Petersen, 703-767-3164, david.c.petersen16.civ@mail.mil

Joint Science and Technology Office for Chemical and Biological Defense (JSTO-CBD)

Requirement #: CBD-16-BAA-RIF-0001
Title: Coating to Enhance CB Agent Resistance
Military System or Acquisition Customer: Joint Program Manager – Protection; Joint Service Contamination Mitigation Coatings Program
Description: The warfighter requires a way to enhance chemical warfare agent (CWA) resistance of Chemical Agent Resistant Coatings (CARC) in order to improve success of decontamination that will allow return of contaminated equipment to normal use. This topic seeks innovative solutions to this end while maintaining camouflage characteristics of CARC. Respondents to this request shall mature either a temporary (applied by an operator upon deployment) or a permanent (applied during CARC application) overcoat to CARC. A temporary overcoat technology shall have a service life at least 2 months. A permanent coating shall have an objective service life equivalent to that of the CARC. The overcoat must maintain optical characteristics of underlying CARC (as measured via reflectance between 400 nanometers (nm) and 1.8 micrometers (μm) and gloss properties as listed in MIL-DTL-64159 (MIL-DTL = Detail Specification). While in use, the overcoat must reduce chemical warfare agent (CWA) retention to at most 0.4 micrograms per centimeter squared ($\mu g/cm^2$) for distilled sulfur mustard agent (HD), 0.25 $\mu g/cm^2$ for Soman nerve agent (GD), and 0.24 $\mu g/cm^2$ for nerve agent VX following 6 hour exposure to 0.1 milligram per centimeter squared (mg/cm^2, which is equivalent to 1gram per meter squared, $1g/m^2$) challenge. CWA retention is assessed by calculating extracted residual CWA concentration following a water rinse, soapy water immersion, and final water rinse. Innovative technologies which serve as alternatives to the approaches outlined are also welcome. In describing these alternatives, the offeror must characterize the impact of the alternative technology on the concept of operations and hence the means of quantitatively assessing the effectiveness of each alternative described. Agent testing must be planned and budgeted in the proposal. CWA testing must be arranged by the offeror at a DoD CWA laboratory, or a DoD certified commercial CWA laboratory.
References:

1. Lalain, T; Mantooth, B; Shue, M; Pusey, S; Wylie, D; Chemical Contaminant and Decontaminant Test Methodology Source Document, ECBC, ECBC-TR-980, July 2012
2. Detail Specification: Camouflage Coating, Water Dispersible Aliphatic Polyurethane, Chemical Agent Resistant, US Army Research Laboratory, MIL-DTL-64159B, 24 January 2011
3. Detail Specification: Coating, Aliphatic Polyurethane, Single Component, Chemical Agent Resistant, US Army Research Laboratory, MIL-DTL-53039E, 16 May 2013
4. Detail Specification: Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection, US Army Research Laboratory, MIL-DTL-53072E, 9 May 2013
5. CARC specification: http://quicksearch.dla.mil/ Enter '64159' in the 'Document ID' field and also enter 'CARC' in the 'Find Term 1' field; select 'Rev B' document

Technical POC: Dr. Tracee Whitfield, 410-417-3285, tracee.l.whitfield.civ@mail.mil

Missile Defense Agency (MDA)

Requirement #: MDA-16-BAA-RIF-0001
Title: Big Data Analytics and Decision Making
Military System or Acquisition Customer: Missile Defense Agency (MDA) Command and Control, Battle Management, and Communications (C2BMC)
Description: Interest is focused on methods for extracting, filtering, and analyzing information collected from massive streams of data derived from multiple and disparate sources. The data sources include multiple classification levels from open source to highly classified. Focus is to utilize the analysis results for predicting real-time projections of possible outcomes. This effort should utilize unconventional data sources and collectively leveraging advances from pattern of life (POL) analytics, enhanced situational awareness, and big data processing in a complex system of systems to provide enhanced, actionable information.
Technical POC: Ricard Paladino, 256-450-4337, richard.paladino@mda.mil

Requirement #: MDA-16-BAA-RIF-0002
Title: Ground-based Hardware-in-the-Loop (HWIL) Testbed for Space-based Communication Networks
Military System or Acquisition Customer: Missile Defense Agency (MDA) Kill Vehicles and Nanosat Testbed Initiative
Description: Interest is focused on development of HWIL lab based testbed capable of exercising and assessing network based communications system solutions for multiple space based platforms. Prototype and flight communications systems for space based platforms require ground integration and network testing prior to operation in a relevant environment. Approach should be low cost with the capability of simulating: vehicle dynamics, Doppler shift, fading channel environments, operational distance for uplink, downlink, and platform to platform communications.
Technical POC: David McMahon, 256-450-2852, david.mcmahon@mda.mil

Office of the Assistant Secretary of Defense (Research & Engineering) (ASD(R&E))

Emerging Capability & Prototyping (Joint Capability Technology Demonstration (JCTD))

Requirement #: ASDR&E-16-BAA-RIF-JCTD-0001
Title: Operational Exploration of Multi-Unmanned Aircraft Systems
Military System or Acquisition Customer: EC&P / RRTO
Description: Investigation of operational concepts for employment of multiple Unmanned Aircraft Systems performing kinetic or non-kinetic effects. Schema will explore hub and spoke architecture for autonomous operations. Goal is swarming operations of assets exhibiting characteristics of cognition, netted network, and distributed operations. An existing tactical Unmanned Aircraft System could serve as a surrogate in order to explore operational architectures for simultaneous operations of multiple Unmanned Aircraft Systems.
Technical POC: Chyau Shen, 301-342-0093, chyau.shen@navy.mil

Requirement #: ASDR&E-16-BAA-RIF-JCTD-0002

Title: Enable Future Partners
Military System or Acquisition Customer: Combatant Command (COCOM)
Description: Military equipment loaned, sold or provided to Partner nations can wind up in the hands of enemy forces. The warfighter needs the ability to covertly track and if necessary make that equipment inoperable if it falls into the wrong hands. U.S. Central Command (CENTOM) is seeking innovative solutions to this problem and is seeking proposals that will provide anti-tamper and undetectable tracking mechanisms into systems so that they may be sold or loaned to Partners forces, and ensure that captured equipment can be remotely disabled. Solution must have the ability to locate, track and fix in time and space Green and Surrogate Forces without using dedicated ISR assets.
Technical POC: Cheryl Holbrook, 703-697-3984, cheryl.a.holbrook2.civ@mail.mil

Requirement #: ASDR&E-16-BAA-RIF-JCTD-0003
Title: Rapidly Adaptable, Mobile, and Scalable Energy Resilience Solutions (RAMS-ERS)
Military System or Acquisition Customer: DoD-wide, Critical Mission Operations
Description: DoD is seeking innovative technologies for a potential prototype demonstration of rapidly adaptable, mobile, and scalable energy resilience solutions (RAMS-ERS) to support critical mission operations on its military installations. Energy resilience is the ability to prepare for and recover from energy disruptions that impact mission assurance on military installations. RAMS-ERS solutions should be rapidly configurable to at least 1 megawatt and operational in no more than 2 hours. RAMS-ERS will be capable of providing highly reliable, continuous energy to critical mission operations for at least 336 hours. Proposers should demonstrate a clear understanding of raw availability and other technical metrics such as inherent (A_i) and operational (A_o) availability, reliability, and quality. Proposers should also include system integration needs (e.g., inverters, transfer switching, etc.) and logistic assumptions (e.g., location, distance and time traveled for delivery, fuel needs, etc.) to be considered.
Technical POC: Dr. Ariel S. Castillo, 571.372.6858, ariel.s.castillo.civ@mail.mil

Emerging Capability and Prototyping (Rapid Reaction Technology Office (RRTO))

Requirement #: ASDR&E-16-BAA-RIF-RRTO-0001
Title: Remote Sensing of Long-Term Underwater Aircraft Wreckage
Military System or Acquisition Customer: Defense POW/MIA Accounting Agency (DPAA)
Description: There are 83,000 missing Service Members from World War II, the Korean War, and the Vietnam War. Approximately 75% of those individuals are located in the Asia-Pacific region, with an estimated 28,500 categorized as potentially recoverable water losses. The DPAA requires novel surface and/or subsurface maritime search capabilities to conduct remote-sensing and location of aircraft wreckage to facilitate the subsequent location and recovery of human remains. The technology may include new combinations of existing underwater sensing methodologies and/or new sensing methodologies designed specifically to detect aircraft wreckage. The prototype(s) must be engineered to locate aircraft wreckage that may be dispersed over an area of the seafloor and has been underwater for over 50 years in a variety of maritime conditions. Goal of this project is to produce operational proof-of-concept prototype(s) for demonstration at DPAA selected sites in the Pacific Ocean. Demonstration will occur in a localized search area based on historical research analysis. The overarching intent is to refine

existing technologies and develop innovative applications of those technologies in order to locate underwater aircraft sites situated in a range of environmental contexts. The additional applicability of the prototype(s) to regions other than the Pacific is desired. Offeror must describe intended means of conveyance of the capability to the Pacific region and the support requirements to enable the prototype's operation. Operational parameters include the capability of operating in depths up to 600 feet (200m), with a daily onsite average coverage of 10 square miles (16km^2).
Technical POC: Ken Kroupa, 703-697-4077, kenneth.j.kroupa.civ@mail.mil

Requirement #: ASDR&E-16-BAA-RIF-RRTO-0002
Title: Hand-held Rapid DNA Screening Device
Military System or Acquisition Customer: U.S. Special Operations Command and U.S. Central Command
Description: The DoD has a requirement to develop DNA profiles from reference samples in austere environments during dismounted operations. This device must also have the capability to compare the DNA profiles of not less than eight loci with an on-board watch list. The loci used must be part of the FBI's core-CODIS loci set. The device must be battery powered, hand carried, weigh less than five pounds, and be sufficiently rugged for use during dismounted military operations. The device must be self-contained and require no user interaction after reference sample insertion through match/no-match determination by the on-board expert system. Chemistries/consumables may be placed on chip or device inserted into the primary device, but those consumables chips must meet the same ruggedized requirements of the primary device and have a shelf-life of not less than 12 months. The device must guarantee not less than 100 runs before manufacturer maintenance is required.
Technical POC: Ken Kroupa, 703-697-4077, kenneth.j.kroupa.civ@mail.mil

Requirement #: ASDR&E-16-BAA-RIF-RRTO-0003
Title: Universal Biometric Translator
Military System or Acquisition Customer: PM DoD Biometrics
Description: DoD requires a Universal Biometrics Translator toolset to convert non-standard electronic biometric file formats into the standardized format required for the DoD Automated Biometric Identification System (ABIS). Through data sharing relationships with international partners and other non-DoD sources, DoD receives thousands of records annually that must be manually converted into the appropriate Electronic Biometric Transmission Standard (EBTS) format before biometric matching can be attempted on these records. Although most collections follow general biometric standards, each file source is unique and requires different mechanisms to process them into a suitable format for submission to ABIS. The need to manually translate non-standard records into standardized records delays the biometric response to end users, and uses significant manpower. The Universal Biometrics Translator must be a configurable tool, capable of processing large batches of non-standard biometric and biographical data into a standard format. Some manual pre-processing configuration is acceptable, but the tool should be capable of processing very large batches of biometric records without manual intervention. This tool must be significantly faster overall than current manual processes. The tool must eliminate routine manual intervention and reduce the possibility of errors from manual translation. The tool must recognize previously-encountered configurations, and automatically apply those specific translation rules.
Technical POC: Jon Lazar, 703-697-4084, jon.e.lazar.civ@mail.mil

Emerging Capability and Prototyping (Technology Integration Office (TIO))

Requirement #: ASDR&E-16-BAA-RIF-TIO-0001
Title: Object Based Analysis for Actionable Intelligence and Big Data
Military System or Acquisition Customer: Distributed Common Ground Station (DCGS), Air Operations Centers (AOC) and Director, Intelligence Innovation Programs Air Force/A2I
Description: Object based production (OBP) is being implemented as a "whole of community" initiative that fundamentally changes the way the Intelligence Community (IC) and the Department of Defense (DoD) organizes and shares information and intelligence. The Air Force as well as the other services has a critical requirement to make the DCGS' and AOCs more agile and responsive to improve the quality and timeliness of actionable intelligence. The deliverable should include but not limited to the necessity to organize and share large volumes of information, be able to operate in the IC's OBP architecture, and demonstrate the ability to ingest DCGS and AOC data. Success will be measured with a significant decrease in processing timeliness and increase in actionable intelligence.
Technical POC: Timothy M Boudreaux, 703-746-1363, timothy.m.boudreaux.civ@mail.mil

Joint Improvised-Threat Defeat Agency (JIDA)

Requirement #: ASDR&E-16-BAA-RIF-JIDA-0001
Title: Communication and Geolocation through the Earth
Military System or Acquisition Customer: US Army Corps of Engineers, Engineer Research and Development Center
Description: Provide a small (cell phone size) device capable of communication and geo-location within a tunnel. Although systems have been developed to communicate to and from individuals or sensors in tunnels, the devices that are currently available tend to be large, i.e., a loop antenna that is not easy to carry. A small communication system that is also capable of geo-locating individuals or sensors in a tunnel while it is being operated within the same tunnel is highly desirable. System components above ground could be relatively large, although portability is still required. Initiative would conclude with a system prototype demonstration in an operational environment.
Technical POC: George Pappas, 703-604-2836, george.pappas2.civ@mail.mil

Requirement #: ASDR&E-16-BAA-RIF-JIDA-0002
Title: Detection of Tunnels using Thermal Imaging
Military System or Acquisition Customer: Night Vision and Electronic Systems Directorate
Description: Provide a temperature measurement system capable of operation on an aircraft that will detect the presence of a tunnel by measuring the temperature of the soil on the surface. It may be possible to detect the presence of a tunnel by measuring the temperature of the soil on the surface because the thermal conductivity and capacity of the air in a tunnel is different from that of the surrounding soil and so the temperature of the surrounding soil will be different from the temperature of the soil at the same depth that is not in the vicinity of a tunnel. The details of this phenomenon will depend upon the extent of the temperature variations on the surface above the

tunnel therefore a mechanism must also be employed to account for any changes in emissivity of the surface above the tunnel. This initiative would conclude with a system/subsystem model or prototype demonstration in a relevant environment. The temperature measurement system could be demonstrated on the ground, however, the systems must be capable of operation on an aircraft.
Technical POC: George Pappas, 703-604-2836, george.pappas2.civ@mail.mil

Requirement #: ASDR&E-16-BAA-RIF-JIDA-0003
Title: Monitoring and Forecasting Regional Threat Using Open Source/Social Media Influenced Conflict Indicators
Military System or Acquisition Customer: Intelligence and Information Warfare SPAWARSYSCEN ATLANTIC, Tampa, FL
Description: The ability to accurately forecast areas of conflict and assess the level and type of threat to our interests worldwide has been a longstanding goal. JIDA wishes to create an Integrated Regional Threat Model (IRTM) that will revolve around creating contextual relationships between disparate categories of information (e.g., reporting, global Internet, etc.) to recognize patterns that indicate the presence of precursors of violent conflict (PVC). The failed state index and supporting data provide a rich environment of content that can be leveraged to create three levels of semi-connected models covering tactical, operational, and strategic problems. The IRTM capability will provide analysts with the ability to evaluate and relate information that may not have been correlated over extended timelines. The IRTM must also include a mechanism to compile a vast data set and including it within a rich presentation environment to facilitate understanding. The initiative will conclude with a System/subsystem model or prototype demonstration in a relevant environment for the failed stated problem domain.
Technical POC: Leo Garciga, 703-995-3036, leonel.t.garciga.civ@mail.mil

Research Directorate, Human Performance Office

Requirement #: ASDR&E-16-BAA-RIF-ARL-HPO-0001
Title: Single-Operator Multi-vehicle Control Station
Military System or Acquisition Customer: Numerous DoD Strike and Intelligence, Surveillance & Reconnaissance (ISR) applications (DoD UAS Groups 3 to 5)
Description: The DoD seeks a demonstration of a multi-vehicle control station in which a single operator can supervise and control multiple Group 3-5 unmanned air vehicles. This technology should combine a human-centered approach to designing the interface, and a mission assessment approach to optimizing manpower usage. Unmanned systems have been, and will continue to be, utilized by the Air Force, Army, Navy, and Marine Corps as a force multiplier and a means to extend warfighter reach in contested environments. Manpower for unmanned vehicle operations, and the associated costs, has increased due to today's usage of these systems. Recent research using the government owned and developed Vigilant Spirit Control Station (VSCS) indicates that there are human-centered approaches to building a multi-vehicle control station that result in manageable cognitive workload for a single operator. Solutions should integrate the Vigilant Spirit capability with proposed unmanned air vehicles for demonstration in operationally relevant simulations and/or flight tests utilizing emerging open architecture solutions.

Technical POC: Dr. Guy French, 937-713-7072, guy.french@us.af.mil

Research Directorate, Space & Sensors Systems Office

Requirement #: ASDR&E-16-BAA-RIF-SSSO-0001
Title: Next Generation Mid-Wave Infrared Target Acquisition Sensor Prototype Demonstration
Military System or Acquisition Customers: Joint Strike Fighter Close Combat Weapon Systems / Electro-Optical Targeting System (JSF/EOTS), Javelin Command Launch Unit (CLU)
Description: Conduct a demonstration of an infrared sensor prototype to include the following: infrared focal plane array (IR FPA), enhanced microcooler, and control electronics packaged into an integrated Dewar cooler assembly (IDCA) for applications such as the Javelin command launch unit (CLU) and the Joint Strike Fighter electro optical targeting system (EOTS). The sensor should include lightweight, high-performance infrared sensor prototypes using high operating temperature mid wavelength III-V antimony-based (nBn) strained layer superlattice infrared focal plane arrays (IR FPAs). IR FPAs must be large format (1K x 1K pixel arrays or larger) and have a small enough pixel pitch (8 micrometers (um)) to allow for significantly simplified optics and processing electronics compared to current fielded systems. The technology should enable a significant reduction in size, weight, and power of the current infrared material system unit; improve the overall infrared sensor sensitivity; increase range performance without increasing the effective pupil diameter of the collecting aperture (50% or more increase in recognition range); and ensure steady-state operation within 4 minutes across all environments.
Technical POC: Leslie Aitcheson, U.S. Army RDECOM CERDEC NVESD, leslie.r.aitcheson.civ@mail.mil, 703-704-9392

Requirement #: ASDR&E-16-BAA-RIF-SSSO-0002
Title: Next Generation Dual-Band or Longwave Infrared Search and Track (IRST) Sensor Prototype Demonstration
Military System or Acquisition Customers:
Description: Conduct a prototype demonstration of an Infrared Search and Track (IRST) Staring Sensor System (e.g. F-15, F-18, 3rd Gen Forward Looking Infrared, or Apache Targeting System) to include the following: Large format longwave or dual-band infrared focal plane arrays (IR FPAs), advanced Dewar components to support large field of regard optics, correlated fast-frame electronics, and the integration of fast-frame electronics with read-out electronics supporting processing for high signal-to-noise performance, considerations for electronic image stabilization, all packaged into an integrated Dewar cooler assembly (IDCA). The sensor system should include either high-performance longwave or dual-band infrared sensors using III-V antimony-based (nBn) strained layer superlattice (SLS) IRFPAs. Dual bands can be in Midwave/Midwave for missile warning or Midwave/Longwave for infrared search and track in obscured environments. Single-band Longwave IR with at least 50% lower spatial noise as compared to Mercury Cadmium Telluride (HgCdTe) and high operability leading to significantly improved range in low and high obscuring environment can also be considered. IR FPAs must be highly manufacturable and should enable significant advantages over current infrared materials including have increased sensitivity and performance (50% increase in detection range) and a reduction in size, weight, and power over current IRST solutions.
Technical POC: Leslie Aitcheson, U.S. Army RDECOM CERDEC NVESD, leslie.r.aitcheson.civ@mail.mil, 703-704-9392

National Reconnaissance Office (NRO)

Requirement #: NRO-16-BAA-RIF-0001
Title: Fiber Optic Transceiver Technology Development and Demonstration for Very High Data Transfer and High Reliability Aerospace Systems Applications
Military System or Acquisition Customer: National Reconnaissance Office /Advanced Space Vehicles Technology Branch
Description: Develop and demonstrate a high reliability fiber optic multi-channel transceiver technology capable of at least 120 Gigabytes per second (GBPS) suitable for satellite and aerospace applications, i.e., very low size, weight and power and radiation tolerant. The demonstration vehicle shall provide a flexible platform to support the development of higher data rates (25GBPS/channel going to 56 GBPS/channel). The platform should include and support advanced Build-In-Test (BIT) capability consistent with space, avionic and UAV requirements including point-to-point detection and reporting of fiber plant faults.
Technical POC: L.M. Cohn, 703-808-4250, lewis.cohn@nro.mil

Requirement #: NRO-16-BAA-RIF-0002
Title: Low Size, Weight, and Power (SWaP) Celestial Navigator
Military System or Acquisition Customer: NRO/AS&T
Description: The successful Offeror will develop an imaginative application of novel technology to enable celestial navigation to provide safe passage for military forces worldwide without reliance on the Global Positioning System (GPS). The developed system shall provide real-time determination of orientation and location and support space, airborne, maritime, and terrestrial environments. It shall be low cost, low power (<10 Watts), low weight (< 2 kilograms), and low volume (less than 10x10x5 centimeters). It shall support operation in an unknown (for example, unmapped) area on the Earth. It shall reacquire navigation capability after a temporary power loss and have a level of accuracy, usability and availability consistent with tactical mission use.
Technical POC: Maj Justin Spring, 703-808-3532, springju@nro.mil

North American Aerospace Defense Command / U.S. Northern Command (NORAD / USNORTHCOM)

Requirement #: NORTHCOM-16-BAA-RIF-0001
Title: Nano Payloads for Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (**Nano-C4ISR**)
Military System or Acquisition Customer: SPAWAR SSC Pacific, PEO SPACE
Description: NORAD-NORTHCOM (N-NC) J8 Science and Technology (S&T) is interested in innovative technologies to provide compact payloads for 2017 - 2019 test flights of new high-altitude balloon vehicle using light weight C4ISR capabilities. The technologies should be less than 20 Kg (could include additional energy storage if required for payload), use less than 100 W continuous average. Payloads requiring more power will need to use mass allotment for additional energy storage. Payload size limits are approximately 71cm X 71 cm X 25 cm . Mass and power are larger concerns than physical size. The generic system will handle a low rate

downlink. Higher rate downlinks will affect the mass/power available for the payload. Proposed systems should be optimized to provide the best performing solution at the lightest weight possible. Testing/demonstration of the Nano-C4ISR will be required to substantiate the performance to determine if the technology meets N-NC J8 S&T requirements.
Technical POC: Dr. Hal Moore, 719-554-3292, Harrell.M.Moore2.CIV@mail.mil

Requirement #: NORTHCOM-16-BAA-RIF-0002
Title: High Frequency Surface Wave Radar to Detect Maritime Surface Targets (**HFSWR-M**)
Military System or Acquisition Customer: Navy Surface Warfare Center
Description: N-NC J8 S&T is interested in innovative technologies to provide Maritime Surface over the horizon target detection from shore. The HFSWR-M should be mobile, light weight, and capable of operating in austere/autonomous environments. Threshold detection should be detection of less than 15 meter surface vessel with 3 meter height at 70 Km (over the horizon) and Objective detection would be larger vessel detection over 140 Km. Spectrum range would ideally be capable of frequency hoping for 13.5 MHz, 16.15 MHz, 24.55 MHz, 26.3 MHz, and 40 MHz . The successful system then would be capable of generating a contact report (location, speed, bearing). Proposed systems should be optimized to provide the best performing solution at the lightest weight possible. Testing/demonstration of the HFSWR-M will be required to substantiate the performance to determine if the technology meets N-NC J8 S&T requirements.
Technical POC: Dr. Hal Moore, 719-554-3292, Harrell.M.Moore2.CIV@mail.mil

Requirement #: NORTHCOM-16-BAA-RIF-0003
Title: Austere, Autonomous Hydrogen Generation (**Hydro-Gen**)
Military System or Acquisition Customer: USMC Expeditionary Warfare
Description: N-NC J8 S&T is interested in innovative technologies to provide autonomous, austere hydrogen generation to support persistent stratospheric balloon network. Hydrogen fuel generation should leverage renewable energy sources and minimize logistic footprint to optimize the best performing solution at the lightest weight possible. Threshold objective is 5 Cubic Feet per minute (CFM) and Objective is 10+ CFM. Testing/demonstration of the Hydro-Gen will be required to substantiate the performance to determine if the technology meets N-NC J8 S&T requirements.
Technical POC: Dr. Hal Moore,719-554-3292, Harrell.M.Moore2.CIV@mail.mil

U.S. Pacific Command (USPACOM)

Requirement #: PACOM-16-BAA-RIF-0001
Title: Broad-spectrum Halogen-free Individual Water Purification
Military System or Acquisition Program Customer: USPACOM Pacific Environmental Security Forum (PESF), Army, Marine Corps, USSOCOM
Description: Joint, special operations, coalition and relief warfighters often work in environments with limited access to reliable and clean drinking water. Remote operations may not support powered water purifications processes. Additionally, traditional halogenated water purification tablets can pose secondary health risks, especially when used in water with high dissolved organic content. The need is for a halogen-free, broad spectrum water purification agent designed for individual warfighter use that is *thermally stable*, available in dry form,

environmentally benign and safe for use in water with high dissolved organic content. Specifically, broad spectrum efficacy means having capacity to purify water containing: (1) viral, bacterial (vegetative and spore form), fungal and single cell pathogenic microorganisms; (2) main classes of chemical warfare agents; (3) certain toxic heavy metals and/or their oxides, such as arsenic compounds; (4) suspended and dissolved organic matter. The fine-tuning and packaging of this agent for use by US forces and coalition partners offers an alternative to current halogen-based agents that pose secondary health risks. This solution has *military, Humanitarian Assistance - Disaster Relief, and civilian applications*. The advancement of this technology forms a basis for *engaging with coalition partners* at the intersection of security and environmental concerns.
Technical POC: F. Michael von Fahnestock, Ph.D., USPACOM J85, 808-477-9157, frank.vonfahnestock@pacom.mil ; Mr. Shannon Knight, USPACOM J85, 808-477-7512; Mr. Christopher Sholes, PMP, USPACOM J445, 808-477-9420

Requirement #: PACOM-16-BAA-RIF-0002
Title: Collective Mission Effects (C-ME)
Military System or Acquisition Program Customer: Program Managers (PMs) for Unmanned Aerial Systems
Description: Joint and coalition forces require unmanned aerial vehicles (UAVs) to support military operational capabilities. Individually these systems are capable but collectively using multiple UAVs can enhance capability in terms of timeliness, range, effects or more. Goal is to demonstrate and deliver a mission enhanced system based on collective UAS input. The system can be demonstrated at an operational test environment using electronically interlinked UAVs, but must be modular, open architecture in terms of algorithms that can address areas of operational capability beyond line-of-site, and at long ranges to support key focus areas such as disparate-data-fused intelligence, surveillance, and reconnaissance (ISR), degraded position, navigation and timing (PNT), communications (dissemination of situation awareness information), and electronic warfare.
Technical POC: Lt Col Kenneth Fisher, USPACOM J85, 808-477-8049, kenneth.fisher1@pacom.mil

Requirement #: PACOM-16-BAA-RIF-0003
Title: Persistent Elevated Sensor for Maritime Tracking and Identification and Cruise Missile Defense
Military System or Acquisition Program Customer: US Army Armaments Research Development and Engineering Center (ARDEC)
Description: USPACOM and US Army Pacific (USARPAC) are looking for novel elevated sensor technologies / modalities that can provide wide defensive radar coverage and can detect, track, and identify objects like surface ships, missiles, manned and unmanned aircraft from long distances. The system should remain airborne and operational for multiple days at a time. This potent combination of persistence and capability give defenders more time and more battle space to identify potential threats, make critical decisions and conduct crucial notifications. This system will allow the military to safeguard hundreds of square miles of territory at a fraction of the cost of an approach employing one or more manned fixed wing aircraft; and it may integrate with existing integrated air and missile defense systems. The system should provide persistent coverage for a 30-day period. The approach must demonstrate a significant reduction in

manpower from what is required to perform current fixed wing aircraft approaches. The requirement is for the system to be developed, demonstrated, and delivered.
Technical POC: Andrew Wood, 808-438-8305, andrew.j.wood.civ@mail.mil

U.S. Southern Command (USSOUTHCOM)

Requirement #: SOUTHCOM-16-BAA-RIF-0001
Title: Counter- Unmanned Air Systems (UAS) for Force Protection
Military System or Acquisition Customer: I2WD
Background: Hobbyist and non-state actors are expanding their use of Unmanned Air Systems (UAS) for employment Beyond Line of Sight (BLOS). For the Command and Control (C2) of small and medium UAS they are transitioning from conventional VHF/UHF and unlicensed WiFi spectrums to the wireless spectrum coverage provided by mobile cellular carriers, some of which can have a global reach.
Description: To counter the threat of Transnational Criminal Organizations, Drug Trafficking Organizations, Terrorist Organizations and/or other non-state actors implementing UAS C2 systems operating in the wireless, mobile cellular spectrum (3G, 4G, LTE), USSOUTHCOM require a Counter-UAS capability to support Force Protection, particularly of military installations, Forward Operating Bases (FOBs), and deployed forces. To Counter-UAS with C2 systems operating in wireless, mobile cellular spectrum, while at the same time not denying all (jamming) wireless communications in that spectrum, a system capable of "managed wireless access" is required to create a managed communication umbrella over a specific location/facility or operational area. Managed communication refers to the ability to allow communication/connectivity only to devices that are on an organization/mission approved list. The managed access solution will enhance Force Protection and should be capable of working within the advanced security of modern mobile networks, such as 3G Universal Mobile Telecommunications System (UMTS), 4G, Long-Term Evolution (LTE) for identification and denial of unknown UAS platforms, while permitting operations unfettered of known, or "whitelisted" devices. The system should be able to operate unattended, configure itself automatically with no SME present. The ability to geolocate all devices detecting if the device is in or out of predefined geofences with reporting ability is required. It should support Military Information Support Operations (MISO) missions by allowing for messaging from Unmanned Air Systems (UAS) or Forward Operating Bases (FOBs), and by enabling free form text messages to be broadcast to mobile devices. With the exception of power requirements, the system should be deployable, portable and self-enclosed.
Technical POC: Mr. Rick Arias, 305-437-1894, ricardo.arias.ctr@mail.mil

U.S. Special Operations Command (USSOCOM)

Requirement #: SOCOM-16-BAA-RIF-0001
Title: Low Collateral Damage Munitions
Military System or Acquisition Customer: Program Executive Office (PEO) – Fixed Wing (FW)

Description: Provide a warhead that reduces collateral damage for current USSOCOM Precision Air to Ground Munitions (PGM) inventory or USSOCOM PGM currently in development. Priority should be for munitions that are compatible with existing common launch tube munitions. Candidates should deliver a low collateral damage warhead that retains a similar ballistics signature of inventory PGM, has comparable or better accuracy and ensures a high number of lethal fragments on target. Target pattern must be predictable and uniform. Use of high fidelity modeling throughout development is encouraged to obtain the desired configuration, reduce weight, increase lethal range, and to maximize the value testing and lethality data. The initiative will conclude with a warhead that has been arena tested and is in a near final and realistic configuration. Project delivers near-term, emerging technology to enhance the capabilities for current military operations.
Technical POC: Erich Borgstede, 813-826-8461, erich.borgstede@socom.mil.

Requirement #: SOCOM-16-BAA-RIF-0002
Title: Unmanned Arial Vehicle (UAV) Group I-III Internal Combustion Engines
Military System or Acquisition Customer: PEO – FW
Description: Present UAV Group I-III internal combustion engines have relatively low reliability and are less efficient than desired. Many of these are hobby engines that are adapted for military UAV use. USSOCOM is looking for purpose built Group I-III UAV internal combustion engines that are highly reliable, easily maintainable and more efficient than current engines. Specific desires include:

- Improved electrical power generation
- Improved engine heat dissipation/thermal management
- Reduced fuel consumption
- Improve endurance
- Reduced engine noise / acoustic management
- Multi-fuel usage including JP-8
- Operable and maintainable in harsh, extreme austere environments

Technical POC: Jim Sadler, 813-826-1971, james.sadler.ctr@socom.mil.

Requirement #: SOCOM-16-BAA-RIF-0003
Title: Family of Maritime, Low Observable Antennae for Combatant Craft Military System or Acquisition Customer: PEO-Maritime/PM Surface Systems
Military System or Acquisition Customer: PEO-Maritime/Program Manager Surface Systems
Description: Develop and transition a family (bank) of low observable, conformal, antennae for use on combatant craft. The Next Generation of Naval Special Warfare combatant crafts are surface space limited for positioning the numerous sets of antennae needed to perform their required missions. A family or bank of antennae operating in the frequency ranges of High Frequency (HF) to Ultra High Frequency (UHF) while maintaining transmit and receive communication connectivity during craft pitches and rolls in elevated seas is needed. The family of antennae must be compatible with space, weight, and power across Naval Special Warfare crafts.
Technical POC: Douglas Simpson, 813-826-3827, douglas.simpson@socom.mil

U.S. Transportation Command (USTRANSCOM)

Requirement #: TRANSCOM-16-BAA-RIF-0001
Title: Alternative Energy Applications- Solid Oxide Fuel Cell (SOFC) Capability
Military System or Acquisition Customer: Army, Navy, Air Force, Marine Corps
Description: Develop and deliver a Solid Oxide Fuel Cell (SOFC) capability that operates on common tactical fuels (Diesel, DF2, JP-5, and JP-8) to support deployable tactical communications. Under the Operational Energy Strategy (OES): "More Fight, Less Fuel: Reducing Fuel Use in Military Operations" focus area, directly calls for all services to:1) Place priority on innovations that can benefit current operations; 2) Invest in research, development, testing, evaluation, and fielding of efficiency improvements in equipment, logistic delivery methods, weapons platforms, and energy conversion; 3) Apply investments to rapid fielding, mid-life upgrades of platforms, systems, equipment, and long-term development of new capabilities. Future sustainability plans for early and initial entry systems would require procurement of a lightweight, modular, and flexible power generation system to enable self-sustainment and organic reliance in austere environments. This initiative will address the power support infrastructure of this very critical important operational area from all aspects; system logistics, mobility, agility, efficiency, scalability, security, and other relevant factors.
Technical POC: Braulio Rodriquez, 813-828-0563, braulio.r.rodriguez.civ@mail.mil