Air Launched Effects Configurations, Trades, and Analyses

Table of Contents

A. AIR LAUNCHED EFFECTS CONFIGURATIONS, TRADES, AND ANALYSES

A–1. INTRODUCTION

The Army Contracting Command - Redstone on behalf of the U.S. Army Combat Capabilities Development Command (CCDC), Aviation and Missile Center (AvMC), Technology Development Directorate - Aviation (TDD-A) is soliciting technical and cost proposals to conduct a science and technology (S&T) effort entitled Air Launched Effects Configurations, Trades, and Analyses (ALE CTA). . Call Number W911W6-21-R-0014 is issued under Master Broad Agency Announcement (BAA) W911W6-21-R-0013. This acquisition is 100% set-aside for Small Business Concerns.

A–2. BACKGROUND

Currently, Army aircraft lack adequate reconnaissance, targeting and weapon options to engage and defeat threat targets at standoff across the full range of engagement profiles and can no longer achieve overmatch due to limitations in locating, identifying, targeting, and options for precision and non-precision munitions. The future multi-domain operational environment will present a highly lethal and complex set of traditional and non-traditional targets that will include networked and mobile air defense systems with extended ranges, and long and mid-range fires systems that will deny freedom of maneuver.

To gain and maintain overmatch in the future conflict, Army Aviation must modernize and distribute its reconnaissance, surveillance, target acquisition (RSTA) and lethality with an advanced team of manned and unmanned aircraft as part of an ecosystem including Future Attack and Reconnaissance Aircraft (FARA) and ALE. The synergistic effect of the ecosystem enables the penetration and dis-integration of an adversary's Anti-Access Area Denial (A2AD) environment, which is comprised of an Integrated Air Defense System (IADS), Integrated Fires Complex (IFC), and electronic warfare (EW) systems. ALE must be able to detect, identify, locate, report (DILR), and deliver lethal and non-lethal effects against threats across multiple scenarios and domains in a constantly changing Operational Environment (OE). ALE will provide RSTA and organic extension/standoff to the FARA ecosystem, using supporting Long Range Precision Fires (LRPF) to deliver effects against peer threat IADS, IFC, and electronic warfare (EW) systems.

Simply put, ALE is a critical component of the FARA ecosystem's ability to regain the asymmetric advantage in reach, stand-off, protection, and lethality required in the execution of joint combined arms and maneuver operations.

TDD-A has an interest in exploring the development of advanced technologies to inform Air Launched Effects (ALE) Unmanned Aerial Systems (UAS) investment decisions. The ALE UAS Configuration Trades and Analyses (CTA) is planned to be a FY21-22 science and technology (S&T) effort to inform the ALE requirements and enable the development of an acceptable-risk acquisition program intended for a new Army Aviation capability. The objective of the ALE CTA is to provide conceptual designs, trade-space analyses and sensitivities intended to inform the ALE key capability-enabling air vehicle development effort.

A–3. DESCRIPTION

a. Extent and Purpose

This request for proposal addresses the ALE-CTA. This ALE-CTA effort will be conducted to develop feasible conceptual designs that meet, to the extent possible, notional air vehicle requirements. Air vehicle weight, performance, attributes, and affordability will be assessed, including effects of projected technology insertions. Critical enabling technologies will be identified, and technology development plans established.

The purpose of the ALE-CTA is to:

(1) Define aircraft designs for key trades;

(2) Develop size, weight, cost, and performance sensitivities;

(3) Show promising approaches to meet desired capabilities and attributes;

(4) Identify capability-enabling technologies;

(5) Quantify technology readiness;

(6) Establish a design and technology assessment approach to justify design and technology selections

b. Execution

Successful Offerors will define a design study that results in one or more aircraft concepts that are affordable, technically feasible, and accomplish the mission tasks. Section B-1 summarizes the design trades and sensitivities desired for this study. Each aircraft concept shall be designed to meet a single combination of the design trade attributes and design guidance. Sensitivities should be performed using the aircraft concept as determined by the design trade. A Design Guidance document that includes performance capabilities, trade-offs, sensitivities, and draft specifications is available upon request only to those Offerors who have a valid Joint Certification Program (JCP) certification number. Please email your JCP certification number and CAGE code to the contracting office identified in the Call to receive the design guidance document. If your organization does not have a JCP certification number, please refer to their website for assistance at:

https://public.logisticsinformationservice.dla.mil/jcp/search.aspx

The design study should include assessments/contributions of technology insertions/developments expected in the development period (FY22-26). The design and technology assessment approach should describe, in detail, the critical enabling technologies, technology maturation plan to reach a Technology Readiness Level (TRL) of 6 by FY26, and development approach and risks.

The ALE-CTA effort should have the following end-state:

(1) Conceptual designs of aircraft based on Government and derived requirements for key trades as described in Section B-1 and the design guidance. The final details of the design guidance will be provided by the Government prior to program kickoff.

(2) Design sensitivities derived from aircraft concepts, as determined by the design trades, with minimum attribute increments to show trends (see Section B-1). The final details of these design sensitivities will be provided by the Government prior to program kickoff.

(3) A technology assessment and development plan, as detailed in Section B-2, addressing technology advancements required to achieve stated performance of the aircraft design.

A–4. ANTICIPATED FUNDING LEVEL AND PERFORMANCE PERIOD

The anticipated funding level for this topic is approximately five to seven million dollars ($5M to $7M); one million dollars ($1M) per award. The topic is expected to result in multiple awards, which may address only part of the topic's objectives (partial awards). Any Government award is subject to the availability of funds. The period of performance for *Topic: Air Launched Effects Configurations, Trades, and Analyses (ALE-CTA)* is anticipated to be 12 months, including technical and administrative portions. A notional schedule of the overall effort is provided as an example in Figure A-1.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Kickoff	X													
Program Management Plan	X													
Technical Status Report			X			X			X			X		
Financial Status Report			X			X			X			X		
Quarterly TIMs			X			X			X					
Final Presentation of Findings												X		
Aricraft Design Trade														
Design Sensitivies														
Design and Technology Assessment														
Draft Final Report and Technical Data Package												X		
Final Report and Technical Data Package														X

Figure A-1. Program Schedule (SAMPLE)

A–5. DATA ITEMS/DELIVERABLES

All awards under this announcement will require delivery of the following data items or deliverables in recipient or contractor format, described fully in Section C:

a. Program Management Plan, Deliverable 1

b. Technical Status Reports every three months, Deliverable 2

c. Financial Status Reports every three months, Deliverable 3

d. Quarterly Technical Interchange Meetings every three months, Deliverable 4

e. Final Presentation of Findings, Deliverable 5

f. Final Report and Technical Data Package, Deliverable 6

All awards will include a requirement to present results in a final conceptual design review presentation in Huntsville, AL (or other suitable location to be determined by the Government) upon completion of all technical effort.

A–6. SECURITY REQUIREMENTS

Pre-award access to or submission of a classified proposal is not authorized.

A–7. GOVERNMENT FURNISHED EQUIPMENT, GOVERNMENT FURNISHED INFORMATION, AND GOVERNMENT FURNISHED FACILITIES

Significant Government and Industry interaction is anticipated through formal and informal contact measures, including technical interchange meetings and design reviews. The following Government Furnished Information (GFI) is provided as part of a Supplemental Package:

(1) Aircraft Design Guidance;

(2) Technical Data Package Guidance;

If applicable, it is the Offeror's responsibility to identify, coordinate, and furnish supporting documentation for use of any Government furnished equipment (GFE), information, or facilities.

A–8. DATA RIGHTS

The Government requires, at a minimum, *Government Purpose Rights* as defined by the Department of Defense Federal Acquisition Regulation (DFARS) 252.227–7013, to all technical data, and deliverables developed during this topic. It is the Offeror's responsibility to clearly acknowledge or take exception to the Government's requirement for at least *Government Purpose Rights*.

A–9. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

Classified responses will not be accepted. Unclassified technical and cost proposals should be submitted electronically submitted through the DoD Safe Access File Exchange at https://safe.apps.mil.

Send an email to brian.m.cosgriff.civ@mail.mil and laurie.a.pierce2.civ@mail.mil with the subject "**Drop-off request Call W911W6-21-R-0011**", at least 3 business days prior to the due date and a link to the DoD SAFE site will be provided.

Interested offerors must request the Supplemental Package and verify eligibility to receive it by providing a verifiable Joint Certification Program (JCP) number or a copy of a current, valid DD Form 2345, DoD Directive 5230.25.

Questions shall be submitted via email to brian.m.cosgriff.civ@mail.mil and laurie.a.pierce2.civ@mail.mil. All questions must be submitted within 14 days prior to the Call closing date to ensure response. All questions and responses received will be posted to https://beta.sam.gov via amendment to the Call.

Responses should be provided in Microsoft Word or as a portable document format (*.pdf) file. In addition to other format, the cost proposal shall be provided in Excel format for cost verification purposes.

Specific instructions pertaining to the content and structure of proposals is specified in Master BAA W911W6-21-R-0013. For the Technical Volume, disregard Master BAA Technical content unless otherwise noted below.

(1) Official Transmittal Letter and Cover Page – see Master BAA.

(2) Volume I—Technical. The Technical Volume of the proposal shall include the following:

(a) Establish credible potential for proposed concept(s) to surpass and extend beyond current capabilities with the goal of meeting desired attributes summarized in Table B-1 and design guidance.

(b) Define a thorough, complete, and clear approach to conducting aircraft design trades and design sensitivities at the appropriate level of detail in order to communicate the overall design along with innovative or unique critical features, size, weight, cost, and performance of concepts.

(c) Include a description of the suitability and availability of facilities and qualified personnel to perform the engineering analyses and generate necessary data to support aircraft design trades and sensitivities.

(d) Include a description of the Offeror's previously demonstrated ability to conduct aircraft design, design trades and sensitivities, and technology and risk assessments, including engineering analyses and documenting in a technical report.

(e) Include a draft Management Plan that clearly states the technical objectives, the specific approach to be pursued, and supporting background experience. (Refer to Section C, Deliverable 1).

(f) Include a description of industry partnership arrangements and define roles and responsibilities. The plan to award any subcontracts in a timely manner and effectively manage those subcontracts should also be included.

The Technical Volume shall not exceed 30 pages. The font size shall not be less than 10 pitch and the line spacing shall be single line.

(3) Volume II—Cost. See Master BAA for Cost Volume content

A–10. EVALUATION CRITERIA/BASIS FOR AWARD

Proposal Evaluation Criteria

The selection of one or more proposals for award will be based on a scientific and/or engineering evaluation of proposals (both technical and cost as it relates to technical effort) in accordance with the criteria set forth in this section. Proposals will be evaluated on their own merit without regard to other proposals submitted under this announcement. Each proposal will receive an adjectival rating supported by narrative. The ratings/narrative will be used to develop an order of merit listing. The following evaluation criteria will apply:

(1) Technical Approach. The Government will evaluate the proposed approach in terms of:

(a) Degree to which the proposed concept(s) surpass and extend beyond current capabilities with the goal of meeting desired attributes. In addition, degree to which credibility of claims is established.

(b) Extent to which the developed data will be useful to inform the Government on feasibility, size, weight, cost, and performance of concepts.

(c) Extent to which the aircraft design process (including design and analysis tools) for aircraft design trades and sensitivities, is adequate and at an appropriate level of detail in order to communicate the overall design along with innovative or unique critical features, as well as weight, cost, and performance.

(d) Thoroughness, completeness, and clarity of the proposed approach to conducting aircraft design trades, with respect to aircraft concept feasibility, size, weight, cost, and performance, assessment of critical enabling technologies, and design sensitivities.

(2) Ability to Mature and Translate. The Government will evaluate the Offeror's team in terms of:

(a) Suitability and availability of facilities and qualified personnel to generate necessary data and conduct aircraft design trades and sensitivities.

(b) Ability to mature and translate technologies, tools, special knowledge, skills, data, and designs to a future air vehicle development effort.

(3) Cost. See Master BAA for cost/price evaluation criteria.

Evaluation Criteria Order of Importance: Criteria (1) is more important than (2) and (3). Criteria (2) and (3) are of equal importance.

B. TECHNICAL EFFORT SCOPE DESCRIPTION

B–1. AIRCRAFT CONCEPTUAL DESIGN TRADES AND SENSITIVITIES

a. Summary of Desired Attributes Trades

Key ALE aircraft design trades that are desired include, but are not limited to: dash airspeed, stowed volume, and propulsion type, summarized in the Design Guidance document. Each aircraft design trade should meet at least a single combination of dash speed, stowed volume, and propulsion type and the design guidance. Trades not listed in Design Guidance document that offer significant improvement over existing capabilities and meet the mission tasks and design guidance will be considered. Additional detail is provided in the Design Guidance document, including: performance capabilities, trade-offs, and specifications for an objective aircraft. Offerers shall provide their own table illustrating the trades being proposed.

b. Summary of Design Sensitivities

Key ALE aircraft desired sensitivities include, but are not limited to: payload space, weight, and power, low speed maneuver performance, and mission range. Other sensitivities that highlight significant impacts to desired capabilities will be considered. To provide the broadest examination of the sensitives to varying capabilities on the ALE aircraft design, the set of sensitivities summarized in the Design Guidance document are desired, to the extent possible. Aircraft design sensitivities should be developed with at least three (3) points, including upper and lower boundaries, to show trends. Other boundaries or increments that highlight significant impacts to desired capabilities will be considered. Additional detail is provided in the Design Guidance document regarding the definitions and guidelines for each sensitivity.

B–2. TECHNOLOGY AND RISK ASSESSMENT

A technology and risk assessment shall performed on critical component and/or sub-system technologies. For each selected technology define metrics and establish performance goals, assess target, expected, best- and worst-case values for defined metrics. Describe technical challenges that may limit performance below target value and unknowns represented by the difference between best- and worst-case values. Provide a risk assessment of each selected technology, including statements and levels of likelihood and consequence to meeting projected cost and schedule for a TRL 6 by FY26.

C. DATA ITEMS/ DELIVERABLES (DESCRIPTIONS)

C–1. DELIVERABLE 1

Program Management Plan

Submission Schedule:
Draft – Due with Proposal Submission
Final – Due at Kickoff

Note: The Government will review the Draft PMP during proposal evaluation and return an annotated copy to the respondent upon contract award.

The plan shall include:

(1) Organization with a biographical section describing key personnel, points of contact and contact information which defines the direct lines of control, responsibilities, functional relationships, team structure, and authority.

(2) A description of all interfaces between the Recipient and the Government and between the Recipient and its subcontractors, which are pertinent to the accomplishment of the SOW.

(3) The negotiated SOW and a narrative description of the technical approach, methods, tools, and facilities that the Recipient will employ to accomplish the tasks, including analysis, modeling and simulation, trade studies, and design.

(4) A detailed program schedule (WBS Level 3) depicting the schedule of events associated with accomplishing each task/milestone. Also include schedule for meetings, reviews, and data delivery.

(5) Labor hour, material, and other direct cost estimates shall be included by task, by quarter in a tabular format, and cumulative as a baseline for comparison to subsequent Financial Status Reports.

(6) A description of the facilities and/or data sources to be employed in the effort.

Submission shall be furnished electronically via MS Word® or PDF format.

C–2. DELIVERABLE 2

Technical Status Report

Submission Schedule:
Every 3 months after Kickoff

The technical status report will detail technical progress, major developments, technical issues, and other problems during the reporting period. Each report shall include, as applicable:

(1) Description of procedures, analysis methods/tools, simulation and modeling, trade study methods utilized during performance of the effort

(2) Description of task products/documents and deliverables

(3) Statement of data/results/findings obtained and percentage of work completed to date, both by task and overall

(4) Detailed information about all visits to Government and/or commercial entities made in connection with the contract and a brief summary of results and findings obtained there from

(5) Assessment of all data, findings, and conclusions as a result of each subtask effort.

(6) Discussion of results and/or findings and conclusions for all opportunities, deficiencies, approaches, methodologies, techniques, practices, and design solutions developed, identified, selected, or refined within the scope of each task.

(7) Information regarding any technical barriers encountered and mitigation plans.

(8) Discussion of any supporting spreadsheets, databases, or models.

(9) Plans for the next reporting period.

The Recipient shall submit its first report 75 days after the effective date of the agreement. Subsequent reports shall be submitted every 3 months thereafter.

Submission shall be furnished electronically via MS Word® or PDF document in contractor format.

C–3. DELIVERABLE 3

Financial Status Report

Submission Schedule:
Every 3 months after Kickoff

The report shall provide summarized details, in table or graph format, of the resource status of the Agreement. The report will include the status of the contributions by the participants and an accounting of current and cumulative expenditures and labor hours, by task, including a comparison with planned expenditures and labor hours. Any deviations of more than 10 percent from the Program Management Plan in schedule, resources, technical approach, or labor hours shall be explained along with discussions of the adjustment actions proposed.

The Recipient shall submit its first report 75 days after the effective date of the agreement. Subsequent reports shall be submitted every 3 months thereafter.

Submission shall be furnished electronically in MS Word® or PDF format.

C–4. DELIVERABLE 4

Quarterly Technical Interchange Meetings (TIMs)

Submission Schedule:
Every 3 months after Kickoff

Note: The Government will work with the respondent to organize a date and time for a teleconference and/or web-conference each quarter.

The TIMs will provide an opportunity to discuss technical progress, major developments, and technical issues during the quarter.

Read-ahead material shall be furnished electronically in MS PowerPoint® or PDF format.

DELIVERABLE 5

Final Presentation of Findings

Submission Schedule:
Due 30 days after completion of Technical Effort
Due NLT 12 months after Kickoff

Note: The Government will work with the respondent to organize a date for a one to two day out brief event as a capstone for the effort.

Submission shall be furnished electronically in MS PowerPoint® or PDF format.

The final presentation of findings shall summarize the key results of this effort. The aircraft designs, design trades and sensitivities, and technology assessment, addressing those elements detailed in Section B, shall be presented in sufficient detail to give valid support to the conclusions drawn, provide a detailed discussion of all technical work accomplished and information gained in performance of the Technical Effort, contain pertinent observations, nature of problems, and positive as well as negative results as applicable. The details of all technical work included shall be sufficient to permit full understanding of the techniques and procedures used in evolving the technology or processes developed, conclusions reached, and recommendations made.

C–5. DELIVERABLE 6

Final Report and Technical Data Package (TDP)

Submission Schedule:
Draft due 30 days after completion of Technical Effort
Final due 60 days after completion of Technical Effort
Due NLT 14 months after Kickoff

A draft of the Final Report and Technical Data Package shall be provided for the Government to review and comment prior to the final submission.

Submission of the Final Report shall be furnished in MS Word® or PDF format.
Submission of the Tehcnical Data Package shall be furnished in MS Excel® or comma delimited ASCII text format for tabulated data, PDF for 3-View drawings, and IGES or STEP for CAD models.

The Final Report shall describe the design and underlying supporting analyses. The Final Report shall include an Executive Summary not exceed ten (10) pages. The Final Report shall include detail descriptions of the objective aircraft conceptual designs, design trades and sensitivities, and technology assessment, addressing those elements detailed in Section B. The details of all technical work included shall be sufficient to permit full understanding of the techniques and procedures used in evolving the technology or processes developed, conclusions reached, and recommendations made.

The Technical Data Package shall inlcude tabulated data, 3-View drawings, and CAD models of all results presented in the Final Report.

D. GLOSSARY

D–1. ACRONYMS

A2AD	Anti-Access Area Denial
ALE	air launched effects
ASCII	American Standard Code for Information Interchange
AvMC	Aviation and Missile Center
CAD	Computer Aided Design
CCDC	Combat Capabilities Development Command
CTA	Configurations, Trades, and Analyses
DFARS	Defense Federal Acquisition Regulation
DILR	detect, identify, locate, report
DoD	Department of Defense
EW	electronic warfare
FARA	Future Attack and Reconnaissance Aircraft
GFE	Government furnished equipment
GFI	Government furnished information
IADS	integrated air defense system
IFC	Integrated Fires Complex
IGES	Initial Graphics Exchange Specification
JCP	Joint Certification Program
LRPF	Long Range Precision Fires
MS	Microsoft

NLT	No Later Than
OE	Operational Environment
PDF	Portable Document Format
PMP	program management plan
RSTA	reconnaissance, surveillance, target acquisition
S&T	science and technology
SOW	Statement of Work
STEP	Standard for the Exchange of Product Data
TDD-A	Technology Development Directorate - Aviation
TIM	Technical Interchange Meeting
TRL	technology readiness level
UAS	Unmanned Aircraft System
WBS	work breakdown structure