

Statement of Work for
System Level Discrimination – A Concept
for C4ISR Integrated Target
Characterization

Raytheon Missile Systems
November 18, 2016



Integrated Threat Characterization BAA
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STATEMENT OF WORK (SOW)
***System Level Discrimination – A Concept for C4ISR Integrated Target
 Characterization***
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1. **Purpose:** The purpose of this effort is to provide Integrated Threat Characterization through designing, developing, and demonstrating the System Level Discrimination (SLD) system

(b)(3);10 USC § 130

2. **Background:** System Level Discrimination (SLD) will unify multiple information fusion techniques developed by the community resulting in an enabling technology for threat characterization within the C4ISR node.

(b)(3);10 USC § 130

(b)(3);10 USC § 130

3. **Applicable Documents:**

3.1 The following documents are for guidance and not formally part of the Statement of Work (SOW). In the event of conflicts between the documents referenced and contents of this SOW, the SOW shall be considered a superseding requirement.

3.2 Applicable documents are listed by category and type in the table below:

Applicable Documents	
DoD/MDA Compliance Documents	
DE TRR	MDA DE Technical Reviews Requirements
BMDS SCGs	Specified in the DD-254
DD 254	Contract Security Classification Specification
TRL/ARL Process	Document for TRL/ARL qualification
Industry Standards (For Guidance only)	
ANSI/EIA 649-A	National Consensus Standard for Configuration Management, 2004
White Paper Submission (defines the technical approach)	
HQ0147-15-ATI-BAA	Raytheon's White Paper Response to MDA C4ISR BAA, 21 June 2015

4. **General Scope:** The complete SLD system shall consist of the algorithm code, algorithm description documents, data repositories, database description document, track and fusion data packages, interface definitions, and full documentation for experimental results and analysis. The SLD system shall comply with the following general requirements:

4.1 Consist of a 20 month base effort with one 1-year option after completion of the base year.

4.2 Design to operate with readily available sensor data requiring minimal changes to existing sensor interfaces with Command, Control, Battle Management, and Communication (C2BMC).

4.3 Define the functional and interface requirements for the 2020+ Integrated Threat Characterization functionality.

4.4 Define the functionality required for the C4ISR node, based on systems engineering and trade studies.

4.5 Demonstrate the capability in each of the annual performance periods.

4.6 The defined architecture shall comply with Open Architecture standards with all interfaces open and government owned.

5. **Specific Technical Tasks:** The contractor shall apply a rigorous systems engineering process to accomplish the following tasks:

5.1: **Task 1 – (Program Management Plan):** The purpose of the Program Management Plan (PMP) is to describe program methodologies, establish the project Baseline, enable the planning, controlling, directing and monitoring of progress, and to assess the contractor's performance in the accomplishment of the contracted work objectives/tasks. The PMP shall contain the following at a minimum:

5.1.1 Work Breakdown Structure (WBS) clearly defining all associated costs, resources, schedules and anticipated travel requirements per objectives/task for the base Period of Performance (POP), plus option POP, and a roll-up of the total project cost.

5.1.2 Comprehensive Project Schedule detailing the timelines for WBS task accomplishment, meetings, test events, delivery dates, milestones and the overall project schedule during the contract's POPs. The schedule shall depict the path from "time now" to delivery of each technology prototype using a logical network of linked activities.

5.1.3 A Systems Engineering process section including: System Design & Configuration Management/Control (CM) planning, System Development and Integration planning, Demonstration & Evaluation planning and Final Demonstration/Acceptance procedures.

5.1.4 **Deliverables: CDRL A001-Program Management Plan.**

5.2: **Task 2 – (Reasoning on Threat Characterization):** The purpose of this effort is to design, develop, and demonstrate the algorithm(s) (b)(3);10 USC § 130 to demonstrate an initial Integrated Threat Characterization and inferencing system (b)(3);10 USC § 130

(b)(3);10 USC § 130

(b)(3);10 USC § 130

The contractor shall accomplish the following in performance of this task:

5.2.1 (Base Period) Define a non-proprietary common system language to establish the lexicon used by all elements within the BMDS (b)(3);10 USC § 130

(b)(3);10 USC § 130

(b)(3);10 USC § 130

Also, define all system assumptions and describe how they would be captured,

communicated, and utilized in a system.

5.2.2 (b)(3):10 USC § 130

(b)(3):10 USC § 130

5.2.3 (b)(3):10 USC § 130

(b)(3):10 USC § 130

5.2.4 (b)(3):10 USC § 130

(b)(3):10 USC § 130

5.2.5 (Option Year) Support independent evaluation of this product at the Collaborative Test and Evaluation Center (CTEC).

5.2.6 **Deliverables (Base Period and Option Year):**

- CDRL A002 – Software Design Description (Algorithm Description Document)
- CDRL A003 – Qualification Test Report (Experimentation Results and Analysis)
- CDRL A004 – Computer Software Product (Software Code) with Software Description Document (SDD)
- CDRL A005 – Interface Design Description

5.3: **Task 3 – (SLD with Ambiguity Management):** The purpose of this effort is to develop a proof of concept for the SLD with joint discrimination, tracking, and association solution. (b)(3):10 USC § 130

(b)(3):10 USC § 130

(b)(3):10 USC § 130

The contractor shall accomplish the following in performance of this task:

5.3.1 (Base Period) Extend the track fusion framework to include feature and attribute-aided association.

5.3.2 (Base Period) Demonstrate performance with Track Fusion in the C4ISR node.

5.3.3 (b)(3):10 USC § 130

(b)(3):10 USC § 130

5.3.4 (Base Period) Support independent evaluation of this product at CTEC.

5.3.5 (Option Year) Develop and demonstrate proof of concept prototype of SLD with an integrated joint tracking, discrimination, and association solution.

5.3.6 **Deliverables (Base Period and Option Year):**

- CDRL A002 – Software Design Description (Algorithm Description Document)
- CDRL A003 – Qualification Test Report (Experimentation Results and Analysis)
- CDRL A004 – Computer Software Product (Software Code) with SDD
- CDRL A005 – Interface Design Description

5.4: **Task 4 – (Performance Evaluation):** Define Key Performance Parameters (KPPs) to evaluate overall program performance. In support of this overall task the contractor shall:

5.4.1 (Base Period) Perform a performance evaluation and provide comparisons of KPPs against C2BMC baseline software.

5.4.2 (Base Period) Deliver spirals of the algorithms that have passed testing.

5.4.3 (Base Period) During the first phase of the effort the contractor shall:

5.4.3.1 Develop and deliver a set of KPPs.

5.4.3.2 Develop and execute test scenarios to exercise the performance of the individual algorithms as well as the algorithm suite as a whole.

5.4.3.3 Provide performance evaluations using simulated and real data.

5.4.3.4 Report the results and analysis (with KPPs) of the performance evaluations.

5.4.4: (Option Year) During the second phase of the effort the contractor shall:

5.4.4.1 Add complexity to the scenarios based on additional meta-data and threat intelligence used in the base year.

5.4.4.2 Develop and deliver the refined set of KPPs.

5.4.4.3 Develop and execute test scenarios to exercise the performance of the individual algorithms as well as the algorithm suite as a whole.

5.4.4.4 Performance evaluations shall be done using simulation.

5.4.4.5 Report the results and analysis (with KPPs) of the performance evaluations.

5.4.5: **Deliverables (Base Period and Option Year):**

- CDRL A006 – Technical Report – Study/Services
- CDRL A007 – System/Subsystem Specification (KPPs Used)
- CDRL A008 – Acceptance Test Report (Testing Results)

5.5: **Task 5 – (Program Management):** The purpose of this task is the documentation and dissemination of project progress and results. The program management effort enables the reporting and managing of the project in a manner consistent with SOW requirements and PMP. The contractor shall perform the following at a minimum in support of this task:

5.5.1 Manage the project in accordance with the approved PMP (Task 1) and report any significant deviations in the projects technical, cost, and/or schedule parameters immediately to the COR.

5.5.2 Conduct a project “Kick-off” meeting not later than thirty (30) days after contract award or as specified in the agreed upon PMP. The purpose of this meeting is to review the PMP to ensure both Government and contractor representatives have a common understanding of the effort, are in agreement, and to discuss the details of the effort. This meeting shall also serve as a System Requirements Review for the task and tailored entrance and exit criteria will be required.

5.5.3 Provide Monthly Status Reports containing (at a minimum) all efforts scheduled/accomplished for the reporting period and a schedule for the next reporting period, current costs/status/updates, invention, identified issues/problems with any action required by the Government.

5.5.4 Provide monthly Funds and Man-hour Expenditure reports to accurately depict the project funding progression status. The report shall address all work cost data (conducted or completed) during the report period, expected costs for the following quarter and a cumulative summary of costs incurred. The report shall directly correlate to the monthly invoices associated with the work cost data reported. Submit a final report summarizing all costs through contract completion.

5.5.5 Conduct quarterly In Progress Reviews (IPR) presentations on the project status and demonstrations as required by the COR. The first IPR shall be due to the COR not later than 120 days following contract award. The IPR halfway through the base period will serve as a Preliminary Design Review (PDR) and the design will be proposed in detail. The final IPR during the base year will serve as the Critical Design Review (CDR). Non-PDR/CDR IPRs can be CVTC.

5.5.6 Provide the Final Contract Summary Report detailing all work performed and deliverables received during the contract's period of performance.

5.5.7 Develop a data accession list to provide a means for identifying contractor internal data which has been generated by the contractor in compliance with the work effort described in the statement of work.

5.5.8 Submit DD Form 882 "Report of Inventions and Subcontracts" as applicable. A final negative report shall be required at a minimum.

5.5.9 Deliverables (Base Period and Option Year):

- CDRL A009 – Monthly Status Report
- CDRL A010 – Funds and Man Hour Expenditure Report
- CDRL A011 – Presentation Materials
- CDRL A012 – Contract Summary Report (Final Report with DD250)
- CDRL A013 – Data Accession List
- CDRL A014 – Report of Invention and Disclosure

5.6: Task 6 – (Program Protection):

The contractor shall incorporate secure design and coding practices within SLD product development activities and Systems Engineering processes to minimize security vulnerabilities, risks of malicious code and potential exposure of critical components and information (i.e. Program Protection, System Security Engineering, Software Assurance, Supply Chain Risk Management, Physical Security, Cyber Security, etc.). Software assurance and security processes should be incorporated into applicable documentation. Detailed guidance on these activities can be found in the Defense Acquisition Guidebook Chapter 13 and section 13.7.3.

6: Period of Performance (POP): The Base POP shall be for twenty (20) months from date of award covering the period May 05, 2017 to January 04, 2019 (Base Period). The effort will also contain one single-year POP option for twelve (12) months covering the period January 05, 2019 to January 04, 2020 (Option Year).

7: **Place of Performance:** Proposed work will be performed at facilities operated by Raytheon and their sub-contractors.

8: **Travel and/or Meeting Minutes:** All proposed travel shall be coordinated and approved by the COR prior to travel. All travel shall be in accordance with current Federal Travel Regulations and/or Joint Travel Regulations (FTR/JTR). All travel and/or meeting minutes shall be documented in the Meeting Minutes Report. **Deliverable: CDRL A015 – Report, Record of Meeting/Minutes.**

9: **Government Furnished Property (GFP) and Contractor Acquired Property (CAP):** The contractor shall provide all labor, equipment, expertise, materials and transportation necessary for the performance of this contract unless otherwise directed by the Contracting Officer. The Government will not provide any facilities, equipment, materials, and/or services for this contract other than stated herein or as otherwise directed in writing by the COR.

9.1: The Government will provide no GFP

9.2: Any resulting GFP/CAP deliverables shall be inventoried and reported in accordance with the deliverable identified in 9.3.

9.3: **Deliverable: CDRL A016 – Government Property Inventory Report**

10: **Other Considerations:** This contract will require access to classified information. All employees working on this contract shall hold clearances at the proper level stated in the DD254. This effort also contains Export Controlled information and all data, deliverables and technical documents should be considered controlled unclassified information.

11: **Key Personnel:** The following individual(s) have been identified as key personnel to this contracting effort:

11.1:

(b)(4),(b)(6)

11.2:

11.3:

11.4: The contractor shall notify the Contracting Officer and COR, in writing, of any request to change the identified key personnel no later than thirty (30) days prior to change. Any new and/or replacements must have equal qualifications to the incumbent and be approved by the COR prior to serving in the position identified.

12: **Deliverables Summary:** Required contract deliverables shall be in accordance with the Contract Data Requirements List (CDRLs), Exhibit A of the contract. Follow the reporting requirements listed on each CDRL. A summary of CDRLs follow:

CDRL Deliverables Summary				
CDRL No.	Para No.	Description	Frequency	Remarks
A001	5.1.4	DI-MGMT-81797 Program Management Plan	1 Draft and 1 Final	- See DD Form 1423-2

A002	5.2.6 5.3.6	DI-IPSC-81435 Software Design Description (Algorithm Description Document)	As Required	- See DD Form 1423-1
A003	5.2.6 5.3.6	DI-QCIC-81890 Qualification Test Report (Experimentation Results and Analysis)	As Required	- See DD Form 1423-1
A004	5.2.6 5.3.6	Computer Software Product ((Software Code) with Software Description Document (SDD))	As Required	- See DD Form 1423-1 - Contractor shall deliver source codes and associated
A005	5.2.6 5.3.6	DI-IPSC-81436 Interface Design Description	As Required	- See DD Form 1423-1
A006	5.4.5	DI-MISC-80508 Technical Report - Study/Services	As Required	- See DD Form 1423-2
A007	5.4.5	DI-IPSC-81431 System/Subsystem Specification (SSS)	As required	- See DD Form 1423-2
A008	5.4.5	DI-QCIC-81891 Acceptance Test Report	1 Draft and 1 Final	- See DD Form 1423-2
A009	5.5.9	DI-MGMT-80368A Status Report (Monthly Status Report)	Monthly NLT 20 th	- See DD Form 1423-2
A010	5.5.9	DI-FNCL-80331A Funds and Man-Hours Expenditure Report	Monthly NLT 20 th	- See DD Form 1423-2
A011	5.5.9	DI-ADMN-81373 Presentation Materials	QRTLY	- See DD Form 1423-2
A012	5.5.9	DI-ADMN-80447A Contract Summary Report	1 Draft and 1 Final	- See DD Form 1423-2 - Submitted with DD Form 250 as Final Acceptance Documentation
A013	5.5.9	DI-MGMT-81453A Data Accession List	1 Draft and 1 Final	- See DD Form 1423-2
A014	5.5.9	37 CFR Appendix R Patent Rules Report of Invention and Disclosure (Patent Application for Invention)	As Required	- See DD Form 1423-2

A015	8	DI-ADMN-81505 Report, Record of Meeting/Minutes (Travel and/or Meeting)	ASREQ	-See DD Form 1423-2
A016	9.3	DI-ADMN-80441 Government Property Inventory Report		-See DD Form 1423-2