



EXCERPT FROM THE
PROCEEDINGS
OF THE
NINETEENTH ANNUAL
ACQUISITION RESEARCH SYMPOSIUM

**Acquisition Research:
Creating Synergy for Informed Change**

May 11–12, 2022

Published: May 2, 2022

Approved for public release; distribution is unlimited.

Prepared for the Naval Postgraduate School, Monterey, CA 93943.

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The research presented in this report was supported by the Acquisition Research Program at the Naval Postgraduate School.

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ACQUISITION RESEARCH PROGRAM
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NAVAL POSTGRADUATE SCHOOL

Technical Data Package Independent Assessment

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Abstract

The Program Management Office (PMO) is responsible for the quality and integrity of the data associated with system delivery and performance. When competing a new system or system update, the Program Manager (PM) is required to complete acquisition planning activities for a specific procurement and to develop a well-conceived acquisition strategy. This activity includes developing and validating Technical Data Package (TDP) requirements. Often, the program staff are committed to managing the current system and do not have the resources to fully review and validate the TDP for a major competition. Therefore, the TDP may not represent the best product to industry.

A PMO may consider having an outside entity conduct a review of their technical data to assess the readiness and viability of the TDP. An Independent Assessment (IA) may provide significant information for understanding what technical data is available, what data is missing for a competitive solicitation, and what needs to be purchased under a new or follow-on contract. An IA can assist with conducting the first steps in the competitive process of developing requirements and conducting market research. The purpose of an IA is to provide the PMO with additional validation that the TDP is sound for a solicitation and subsequent contract.

Executive Summary

The Program Office is required to comply with MIL-STD-31000B for Technical Data Packages. MIL-STD-31000B requires a technical description of an item adequate for supporting an acquisition, production, engineering, and logistics support. The TDP needs to provide an authoritative technical description of an item that is clear, complete, and accurate, and in a form and format adequate for its intended use.

A thorough analysis of technical data during requirements development and market research can have a positive impact on the rest of the source selection process. Releasing



conflicting or missing technical data with the request for proposal (RFP) may result in poor or deficient proposals from industry. Having a strong assessment of the TDP will support a smoother approval process during the initial phase of the acquisition for Acquisition Strategy Panel (ASP) review, to mitigate questions or concerns about the readiness of the competitive package.

The IA may be conducted by an independent non-conflicted party outside of the program office and acquisition organization. The team should be comprised of both acquisition and technical subject matter experts (SMEs).

This research suggests how that independent party may conduct the assessment and provide feedback to the program office prior to RFP release. The independent assessment may be conducted in three phases of the review process:

- Initial Assessment (Phase I). The initial steps include research into TDP compliance documents, including military standards and federal agency guidance, to set the assessment parameters, and conducting an initial review of the TDP documentation. The IA should map the technical documentation against both federal and agency TDP Guidance, identifying redundancies across the various organizations. Once this analysis is complete, the team prepares questions for the interview sessions with the program functional groups representing the PMO.
- Functional Assessment (Phase II). In this phase, the IA team reviews the artifacts with each PMO functional group lead, compiling a recommended list of TDP data with links and locations for the individual documents. The IA team may assess the TDP artifacts by these functional group areas as outlined below. Organization and access plans for the voluminous data are important elements in a TDP review.
- Final Assessment, Comparative Analysis (Phase III). A comparison of the Program TDP with other major system acquisitions within the agency or other federal agencies for lessons learned and to address any omitted or conflicting documentation. This can include a list of applicable documents and include designations of compliance or reference. A peer review by another PMO that has recently conducted a competition can be invaluable in ensuring a quality RFP and source selection process.

The research paper recommended an in-depth review of the technical data by functional area, aligning the content with the PMO structure and Military Standard (MIL-STD) 31000B functional criteria. The PMO SMEs within these functional areas can provide the documentation for the IA. These areas can be adapted based on the PMO organization and its functional staff.

Purpose

A Program Office may consider having an outside entity conduct a review of their technical data to assess the readiness and viability of the Technical Data Package (TDP) for a new program start or a re-competition of a system with existing technical data. The Independent Assessment (IA) will serve as an additional data point for understanding what technical data is available, what data is missing for a competitive solicitation, and what needs to be purchased under a new or follow-on contract.

An independent assessment will assist with conducting the first step in the competitive process of developing requirements and conducting market research to attain industry interest.

A thorough analysis of the technical data during requirements development and market research can have a high impact on the rest of the process by mitigating risk of conflicting or missing technical data after the RFP is released, resulting in poor or deficient proposals from industry. Having strong assessment of the TDP will also support a smoother approval process



during the Acquisition Strategy Panel (ASP) review, limiting questions or concerns about the readiness of the competitive package.

The Independent Assessment needs to be conducted by an independent non-conflicted party, outside of the program office and acquisition organization:

- a non-conflicted private concern familiar with the acquisition process and technical requirements development, typically a small business service company,
- a Federally Funded Research and Development Center,
- an academic organization, such as the Defense Acquisition University,
- a professional organization, chartered to conduct assessments.

Background

The Program Office is required to comply with MIL-STD-31000B for Technical Data Packages (DoD, 2018). MIL-STD-31000B requires a technical description of an item adequate for supporting an acquisition, production, engineering, and logistics support. The TDP needs to provide an authoritative technical description of an item that is clear, complete, and accurate, and in a form and format adequate for its intended use.

Technical data is defined as recorded information, regardless of the form or method of the recording, of a scientific or technical nature, including computer software documentation (DoD, 2018, p. 8). The term does not include computer software or data incidental to contract administration, such as financial or management information. (DFARS Clause 252.227-7013). Therefore, technical data encompasses a broad amount of documentation that can be available to develop and deliver a system.

The purpose of the TDP is to provide a technical description of an item that is clear, complete, and accurate and in a form and format adequate for its intended use. TDPs define the physical and functional characteristics of the accepted configuration of the item and its subordinate assemblies, subassemblies, and parts (DoD, 2018, p. 10).

The TDP comes under the umbrella of technical data management within defense weapons systems acquisition (OUSD[A&S], 2020). The Technical Data Management process provides a framework to acquire, manage, maintain, and ensure access to the technical data and computer software required to manage and support a system throughout the acquisition life cycle (DAU, 2021, Sec 4.3.2.4). Key technical data management considerations include understanding and protecting government intellectual property and data rights, achieving competition goals, maximizing options for product support, and enabling performance of downstream life-cycle functions. DoDI 5000.85, 3D.2.b.(5)(k) IP and 3D.3.c.(5) IP Strategy contains IP and IP Strategy policy for Major Capability Acquisition programs.

Acquiring the necessary data and data rights provide the ability to re-compete item acquisition, upgrades, and sustainment activities in the interest of achieving cost savings. The lack of technical data and/or data rights often makes it difficult or impossible to award contracts to anyone other than the original manufacturer, thereby taking away much or all of the government's ability to reduce total ownership costs (DAU, n.d.).

Technical Data Package Review

The Independent Assessment of a program TDP results in a recommendation whether the technical artifacts are sufficient for the initial release of the RFP.

The information below details the TDP review process that should be followed to ensure a complete analysis of the state of the technical data for posting the Bidders Library for source selection. These task objectives should be included in any statement of work for the IA contractor to ensure a credible review and report.



- Review the TDP artifacts documented in the TDP documentation provided by agency functional area leads for readiness and sufficiency in a competitive source selection.
- Assess the technical data completeness for the artifacts to be posted to the Bidders' Library for use in the RFP phase of the source selection.
- Conduct an in-depth review of the data by functional area, aligning the content with the Agency Technical Data Package Guidance and Military Standard (MIL-STD) 31000B for TDP content.
- Assessment Program Office team's institutional knowledge of applicable federal and military documents to ensure compliance with regulations, guidance, and experience-based best practices.
- Included consideration of data rights, ownership of proprietary software, proprietary business practices, and other items that may/could limit the government's ability to publish key aspects of the program within their Bidders' Library. Ensure the program's contracting and legal offices are engaged in the review processes.

The IA should consider the following assumptions:

- The documents reviewed were provided to the IA team as of the effective date of the final data feed from the program office and technical leads.
- The assessment is based on documents supplied by the program office posted in the TDP artifact library or referenced in any TDP worksheet or spreadsheets.
- All documents provided for review are deemed legally sufficient and approved through legal vetting.
- The Bidders' Library may be divided into areas such as TDP content, governing DoD or agency directives, system documentation, and other information about the agency and the program, depending upon the program source selection team's preferences.
- A document is included in the library as part of the TDP section if it helps to provide a clear picture of the level of work expected of the bidding contractor in the performance of their duties. Documents outlining procedures, checklists, or data (e.g., defense design, map data) may be provided post-award.
- The acquisition may include both development and production system delivery for purposes of TDP definition.
- Top Secret/Sensitive Compartmented Information (TS/SCI) TDP documents may be necessary for a review. The RFI should discuss the need for TS/SCI clearances. The IA Team assumes that the government will have standard operating procedures (SOPs) to view TS/SCI documents during the RFP process.
- Source code is not reviewed during the IA process but is a consideration for the library.

The Final Report should include these categories of analysis and recommendations:

Observations are defined as something that the assessment team took note of throughout the assessment process and determined to be worthy of mentioning for a possible future acquisition.

Considerations are items that the assessment team noticed during the assessment and felt that the government could benefit from applying these points, but they are not necessarily strong enough to warrant a recommendation rating.

Recommendations are the IA team's guidance to the government on the viability and accuracy of the TDP to ensure that the information presented will benefit them throughout their acquisition process.

Assessment by Functional Area

Functional areas will most likely be aligned with the Program Office, rather than the system being acquired, because most technical staff own or maintain the technical data by their



functional office code. They would be most knowledgeable about what data is available and version control.

Not all documents will have the proper classification and distribution markings. Prior to uploading into the Bidders' Library, the government functional team must ensure that all artifacts and documents are properly labeled.

Notional functional areas are shown below and listed in more detail in Appendix 1. These areas can be adapted based on the Program Office organization and its functional staff.

- Requirements & Design
- Development & Integration
- Modeling & Simulation (M&S)
- Anti-Tamper
- Cybersecurity
- Software
- Test
- Verification
- Training
- Transition & Installation
- Operations & Sustainment

The documents should be organized logically and reviewed for relevance and completeness. Are the documents current and accessible by a potential bidder? Is the data releasable to a potential bidder? Are the documents relevant—Does the library contain enough data for the bidder to make an informed proposal? The agency should also consider developing a repository of common government, DoD, and agency documents for consideration with pointers to where the most current references are located (e.g., the System Specification in the Program Technical Baseline Library). This will support the contracting office to develop the list of applicable compliance and reference documents used later in the Statement of Work. This will streamline the library building process and promote consistency between the acquisition phases of the competition.

Independent Assessment Process

The independent assessment can be divided into three phases, as the documentation analysis and review evolve, and is updated based on internal reviews and feedback.

Initial Assessment (Phase I)

The initial steps include research into TDP compliance documents, including military standards and agency guidance, to set the assessment parameters, and conduct an initial review of the TDP documentation received from the agency. The team starts by performing a mapping of the technical documentation against both the MILSTD3100B and any agency TDP Guidance and identifying redundancies across the various organizational tabs. Once this analysis is complete, the team prepares questions for the interview sessions with the program functional groups representing the Program Management Office (PMO).

The IA team conducts interviews during the initial period of the task. These interviews should include most of the agency functional group leads.

Interview Questions: Each functional group lead is provided a series of questions in advance to help facilitate the discussion. The following questions can be asked during the interview:

- What items are classified?



- Which documents are marked “proprietary” by the prime contractor, and of those documents that are marked proprietary, are they considered contract deliverables?
- Can we use the proprietary marked documents in the Bidders’ Library? If so, to what extent?
- Are any of the items listed in the TBL workbook populated by the functional leads considered insufficient regarding the contract delivery instructions? Do they meet the terms and conditions of the contract? Were they delivered on time?
- Charters are listed. Are those charters going to be part of the Bidders’ Library, and if so, why? Charters are typically established post-RFP but may be relevant if they outline the scope of work expected in execution of the proposed contract.
- Are all the documents listed in the TBL workbook considered to be complete and current? It should be clear if the artifacts will need to be periodically revised or resubmitted with updates as the contract and program matures.
- How is the government intending to package all this information for the RFP, and how will it be made available to the bidders in a competitive environment?

Data Categories: The agency functional managers should be asked to place their content into three categories of data: (1) Full access of unclassified non-proprietary data for all interested vendors which will be stored in the Bidders’ Library, and ultimately listed in Appendix J of the RFP, (2) Classified material which is part of the Bidders’ Library for the RFP stored in a secure site with access control to be determined by the government, and (3) Sensitive or proprietary technical data to be provided to winning contractor at the time of award such as mission sets, charters for working groups (WGs), general lists of data, and source code.

Data Markings: The functional group needs to make note of incumbent markings, restrictions, and proprietary rights claims. The government needs to be prepared for an internal government legal review to protect against challenges by the current prime contractor to the agency on markings of data ownership for artifacts included in the Bidders’ Library. For example, source code may be a candidate for proprietary claims from the incumbent, which cannot be shared with other vendors if true and backed by a legal determination.

The artifact file names should be standardized to the TDP artifact master list descriptions. This will become an essential aspect during the solicitation phase of the acquisition, where the TDP will be released to industry in the Bidders’ Library.

Functional Assessment (Phase II)

In this phase, the IA team utilizes the artifact spreadsheet with each PMO functional group lead, compiling a recommended list of TDP data with links and locations for the individual documents.

The PMO team provides a spreadsheet of artifacts organized in a similar manner to the structure of the program office, referred to in this appendix as functional areas. Note that this does not necessarily align with the functional or sub-system components that make up the Program system. The IA team may assess the TDP artifacts by these functional group areas.

A sample of the list of artifact files and how they should be depicted in a table to capture all the functional data in the artifact spreadsheet is shown in Appendix 2.

The IA team conducts an extensive review of the artifacts by searching and checking each link tied to every document. Some documents may not be found in the specified location. The IA team may conduct multiple rounds of updates with the PMO leadership team to locate and recover the missing TDP artifacts.

The Phase II report contains the artifacts recommended by the IA team for inclusion in the Bidders’ Library. The team considers factors such as accessibility by a bidder, utility, and appropriateness of each document, and the presence of any limiting factors such as proprietary



information contained within the artifacts. The team also highlights any areas for clarification and provides recommendations where appropriate.

A sample of the list of recommended artifacts for the Bidders Library is shown in Attachment 3.

It is recommended that prior to uploading into the Bidders' Library, the government team must ensure that all artifacts and documents are properly labeled.

Final Assessment, Comparative Analysis (Phase III)

It is recommended that a Technical Data Package Independent Assessment Report be delivered to the Program Office for review and discussion. Based on that discussion, additional actions may be requested by the PMO to revise and/or update the information.

The IA team can deliver an IA Technical Data Package After-Action Report to include the following updated documentation and further analysis:

- Updated functional technical data analysis to address additional information such as software documents and systems specifications.
- Revised or updated TDP Bidders Library List, based on functional changes.
- A comparison of the Program TDP with other major systems acquisitions within the agency or other federal agencies for lessons learned and to address any omitted or conflicting documentation. This can include a list of Applicable Documents included designations of compliance or reference. A peer review by another PMO that has recently conducted a competition can be invaluable in ensuring a quality RFP and source selection process.

Acquisition Considerations

The agency's need for technical data varies greatly from program to program with multiple factors contributing to each individual program's specific TDP needs. Many times, these factors are driven by the program acquisition and life-cycle support strategies. Factors such as the maturity of the program, the maturity of the program's system and system integrators, different conceptual design data for concept evaluations, or complete sets of detailed design data set points are all factors to be considered when deciding what a TDP should look like for each individual program.

Any upcoming competitive acquisition should consider the following areas as part of their acquisition strategy relative to technical data:

- Data Management Strategy
- Long-Term Strategy for continuous competition
- Intellectual Property Considerations
- Technical Data and Rights in Data
- Contract Data Requirements List (CDRLs) content
- Open Architecture Standards
- Acquisition Best Practices

While a complete TDP may be built in a specific way for one program, it could significantly vary in other programs within the same agency. Further, throughout the RFP process, the TDP may be updated due to feedback from prospective bidders as they request more information, ask questions regarding the TDP, respond to an RFI, or offer technical solutions that the government may incorporate into the RFP.

The key takeaway is that TDPs are not a "one-stop shop" and there is not a single "right" list to choose from when a program develops their own TDP.



The TDP is vital to the success of any competitive acquisition. This analysis is intended to support the critical milestones and events that will be the next steps in the acquisition process. Figure 1 shows the milestones for a competitive acquisition and where the TDP fits into the process and where the TDP can impact the process (in green) through award.

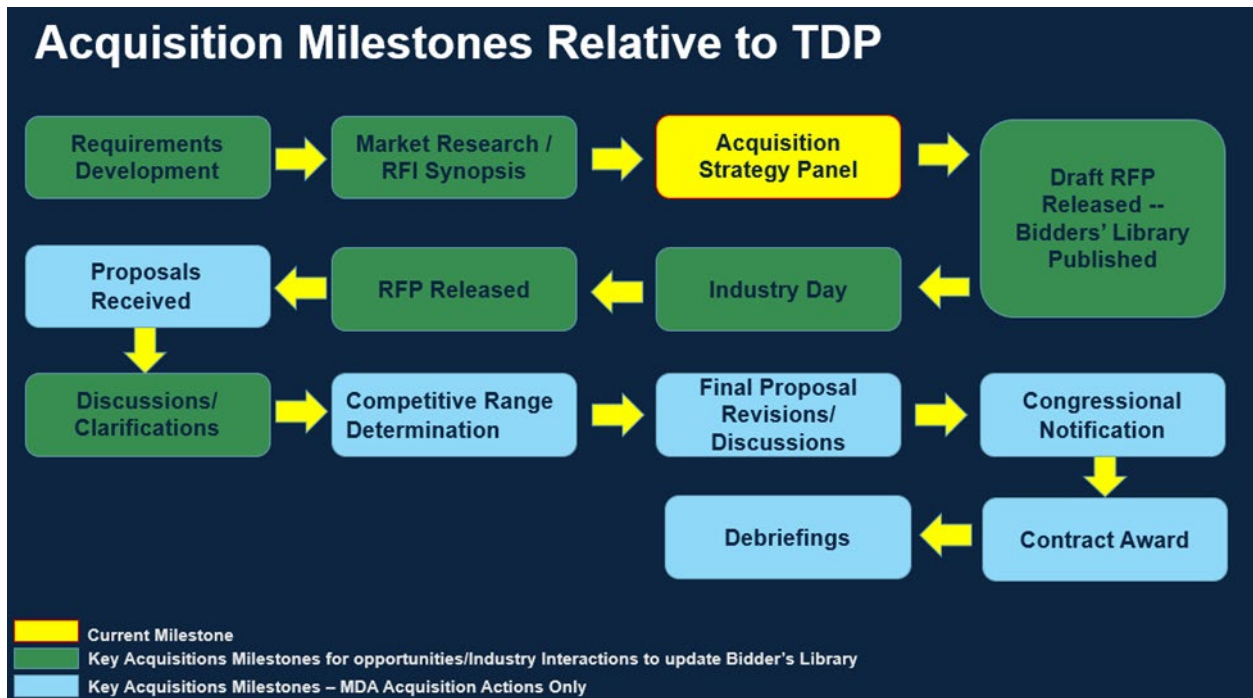


Figure 1. Acquisition Milestones Relatives to TDP

A further description of the impact of the TDP includes the following steps in the acquisition process as shown in Figure 1:

- Requirement development: TDP defined, validated, ready for the Bidders Library.
- Market research/RFI synopsis: Industry Q&A on technical data content and markings.
- Bidders' Library published: TDP available to industry, Q&A on content.
- Acquisition strategy panel: TDP readiness and data strategy addressed.
- Draft RFP released: TDP seen in full context of requirements, Q&A from industry.
- Industry Day: TDP addressed in a briefing, Q&A from industry.
- RFP released: Industry can have TDP Q&A during the solicitation period.
- Proposals received: TDP assumptions and conditions in proposal.
- Discussions/clarifications: TDP can be updated based on Q&A from industry
- Competitive range determination: TDP can impact score and ranking.
- Final proposal revisions/discussions: TDP updated based on Q&A from industry
- Contract award: TDP transferred to new contractor.
- Debriefings: any deficiencies may include TDP issues.

The TDP can be the topic of industry questions up through the final RFP release, allowing for updates and changes to the technical data. However, once the proposals are received, it is difficult to accommodate changes to the technical requirements since it may impact the competition's scope.



Conclusions and Recommendations

This research identifies an approach for a thorough review of the TDP to ensure that technical artifacts are sufficient for an acquisition and highlight areas that need improvement prior to release.

It is recommended that a PMO utilize an independent party to do a thorough review of the technical data prior to any major competition to assure the quality and integrity of the documentation to be utilized by industry to deliver a system.

The PMO should conduct an in-depth review of the technical data by functional area, aligning the content with the PMO structure and Military Standard (MIL-STD) 3100B functional criteria. The PMO SMEs within these functional areas can provide the documentation for the IA. These areas can be adapted based on the PMO organization and its functional staff.

The research concludes that it is appropriate to conduct a review of areas where the TDP may impact the acquisition strategy relative to technical data. These items may include the data management strategy, technical data and rights in technical data, and contract data requirements list (CDRL) content.

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Appendix 1: Notional Functional Areas of Technical Data

Notional functional areas utilized for the TDP independent assessment are listed below and can be adapted based on the Program Office organization and its functional staff.

- **Requirements & Design:** The Requirements and Design functional area focuses on development of future program requirements as well as operations and sustainment of current fielded capabilities. The TDP artifacts listed in this section identify the major components and/or functional requirements that comprise the system.
- **Development & Integration:** This functional area contains artifacts relating to development and integration. A system must have the ability to creatively develop, mature, integrate, and test new technologies quickly and reliably to provide a state-of-the-art defense system. It must also respond to evolution in within the overall system's sensors and weapons systems. This includes all aspects of the systems engineering process, including system design and algorithm software development.
- **Modeling & Simulation (M&S):** The modeling and simulation executable functional area focuses on those artifacts that will create an integrated digital approach across disciplines to support life-cycle engineering is in the planning stages. Models and Simulations will be implemented as a continuum across the Systems Engineering "V" as the authoritative sources of engineering data.
- **Anti-Tamper:** The Anti-Tamper (AT) functional area focuses on protecting the embedded Critical Program Information (CPI) and identifying design documentation which will enable exportability to foreign partners. The TDP artifacts provide systems security



engineering (SSE) background/guidance to protect CPI and enable system exportability in accordance with applicable laws, regulations, policies, and procedures.

- **Cybersecurity and Cyberspace Defense:** Artifacts for the Cyber-resiliency function identifies cyber requirements in early development from current threat intelligence, complies with applicable statutes, regulations, the Risk Management Framework (National Institute of Standards and Technology [NIST] 800 series guidance), and conducts software assurance and cyber-resiliency testing throughout development, capability testing, ground tests, and continuous persistent cyber operations monitoring.
- **System software and source code:** These artifacts are developed, integrated, and tested for the future fielded capabilities. As an alternative, the TDP could include items such as Software Design Descriptions, Interface Design Descriptions, Algorithm Description Documents, operating manuals, and other documents that include descriptions of all hardware, software, firmware, middleware, hypervisors and other specialized application stacks, binaries, operating systems, and scripts/scripting engines, to include build matrices describing usage and platform associations. Including these items in the Bidders' Library would help the bidders understand the scope of the software. Documents should cover the areas such as the language, lines of code, number of subroutines, and interface requirements. What is needed is an understanding of the software and applications supporting mission critical functions, the planned development roadmap, and a listing of sample products to include Verification and Validation (V&V), Assessment and Authorization (A&A), software assurance requirements, scenario development, and any other information necessary for a bidder to understand the complexity and scope of work required. Consider an access plan for the bidders who do request to review the software. Otherwise, the actual software and source code files may be delivered post-award.
- **Test:** The test functional area includes the development, integration, and testing of system software with all additional hardware and external software required to achieve an integrated increment capability. Testing includes both element-level and system-level testing. System testing includes flight tests (FTs), digital predictive analysis, Hardware in the Loop (HWIL) Ground Tests (GTs), distributed GTs, and HWIL cybersecurity testing.
- **Verification:** This functional area identifies how the system must also respond to evolution in sensors and weapons systems of the overall system. As other elements of the system make changes or upgrades, the program must adjust accordingly to maintain critical integrated end-to-end capability. This includes all aspects of the systems engineering process including verification and validation as the resulting system must include a strong cyber security posture and overall system resiliency.
- **Training:** The training functional area seeks to safely separate test, evaluation, and training venues from real-world activities, and allow injection of high-fidelity simulations to run realistic scenarios on operational equipment and networks. The artifacts in this area are necessary to maintain the operational capability of the requirement, to participate in exercises, to train, and to rehearse mission scenarios while the system is in an operational state or "on alert." The architecture will allow for scalable training over the operational architecture and will allow operators to train in their environment. Scalable training can vary from individual assets to regional capabilities, to the full global community.
- **Transition & Installation:** This functional area addresses continued development of system which will require the transition of software builds and the deployment of new hardware as required.



- **Operations & Sustainment:** The operations and sustainment functional area focuses on the ability to operate, maintain, and sustain the current globally deployed system while minimizing total ownership costs for current and future versions efficiently and effectively. The system will continue to support and interface with a variety of globally distributed sensors and communications elements hosted in a variety of facilities. The focus is to increase supportability and reduce hardware and software life-cycle costs of current and future variants in a technology environment that faces rapid turnover and requires increasing cyber resilience.

Appendix 2: Sample List of Technical Artifacts from PMO

A spreadsheet should be created that has columns for reference, title, description, version and/or date of the document, source where it can be found, OPR for the document, and any other notes that may be helpful. Additional columns may be added to identify Government Purpose Rights or Proprietary information, Classification, When to Release (e.g., pre-RFI Bidders' Library or post-Award), CDRL Reference, or other columns appropriate to the program. Locating the documents and verifying the sources can be an arduous task, and updated, clear, consistent record-keeping is essential. Using a spreadsheet allows for ease of maintenance and allows for sorting (to separate by functional area or classification for example).

Ref #	Title	Description	Version/ Date	Source	OPR	Notes
1	System Level Architecture Framework Documentation	Briefing outlining various system level architectural views	V4.7/23 April 2019	Agency Office Code <i>SharePoint Site link</i>	CAG – John Smith	Includes both current and “to-be”.
2	System Engineering Plan	Outlines the systems engineering processes within the program.	V9.3/4 June 2018	Agency Office Code <i>SharePoint Site link</i>	SE/Jane Smith	Also include program-specific SEP
3	System Operator Manual	Outline of how to operate the current system.	V2.3/23 May 2017	Agency Office Code <i>SharePoint Site link</i>	GMN/Sally Ride	Useful as reference for current operations.

Appendix 3: Sample Recommended Bidders' Library Content

	Functional Area (Example: Anti-Tamper)
1	Anti-Tamper Plan (Concept, Initial and Final) from Anti-Tamper Plan Template
2	Attack/Countermeasures Tree Analysis (in support of Anti-Tamper)
3	Technical report: study/services, anti-tamper plan
4	Technical report: study/services, attack countermeasure tree analysis





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