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**DEPARTMENT OF DEFENSE**

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# **Technology Readiness Assessment (TRA) Guidance**



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**Prepared by the  
Assistant Secretary of Defense for Research and Engineering (ASD(R&E))**

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## **Section 1.**

### **Summary**

A Technology Readiness Assessment (TRA) is a systematic, metrics-based process that assesses the maturity of, and the risk associated with, critical technologies to be used in Major Defense Acquisition Programs (MDAPs). It is conducted by the Program Manager (PM) with the assistance of an independent team of subject matter experts (SMEs). It is provided to the Assistant Secretary of Defense for Research and Engineering (ASD(R&E)) and will provide part of the bases upon which he advises the Milestone Decision Authority (MDA) at Milestone (MS) B or at other events designated by the MDA to assist in the determination of whether the technologies of the program have acceptable levels of risk—based in part on the degree to which they have been demonstrated (including demonstration in a relevant environment)—and to support risk-mitigation plans prepared by the PM. The plan for conducting a TRA is provided to the ASD(R&E) by the PM upon approval by the Component Acquisition Executive (CAE).

A TRA is required by Department of Defense Instruction (DoDI) 5000.02 for MDAPs at MS B (or at a subsequent Milestone if there is no MS B). It is also conducted whenever otherwise required by the MDA. It is required for space systems by Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) memorandum *Transition of the Defense Space Acquisition Board (DSAB) Into the Defense Acquisition Board*, dated March 23, 2009. The TRA final report for MDAPs must be submitted to ASD(R&E) for review to support the requirement that ASD(R&E) provide an independent assessment to the MDA.

A TRA focuses on the program’s “critical” technologies (i.e., those that may pose major technological risk during development, particularly during the Engineering and Manufacturing Development (EMD) phase of acquisition). Technology Readiness Levels (TRLs) can serve as a helpful knowledge-based standard and shorthand for evaluating technology maturity, but they must be supplemented with expert professional judgment.

To reduce the risk associated with entering EMD, DoDI 5000.02 requires Requests for Proposals (RFPs) to incorporate language that prevents the award of an EMD contract if it includes technologies that have not been demonstrated adequately. Adequate demonstration in a relevant environment (TRL 6) is one benchmark that is evaluated, but it is not the only consideration, nor necessarily dispositive. As such, a generic TRA not based on the planned specific technical solution is insufficient. Since the TRA must be based on the technologies of the program that entail some element of

risk, TRAs may have to be performed on all the competitors' proposals in a source selection.

In accordance with a USD(AT&L) memo titled *Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending*, dated September 14, 2010, the TRAs described in this *Guidance* replace the former TRAs described in the *Technology Readiness Assessment Desk Book*, dated July 2009.<sup>1</sup> TRAs that must be submitted to ASD(R&E) are required only for MDAPs that require certification under *10 U.S.C. §2366b* or other provisions of law, or when otherwise directed by the MDA. Generally, TRAs are not required for MDAPs at MS C. Independent of the elimination of the formal requirement to conduct a TRA for a Major Automated Information System (MAIS), MS C, and Acquisition Category (ACAT) II–IV programs, all PMs and their chains of command retain complete responsibility for assessing, managing, and mitigating acquisition program technology risk. MDAs for non-ACAT I programs should consider requiring TRAs for those programs when technological risk is present.

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<sup>1</sup> See <https://acc.dau.mil/CommunityBrowser.aspx?id=18545>.

## **Section 2.**

### **Initiating and Conducting a TRA**

#### **2.1 Key Players**

Key players in the TRA process are as follows:

- The Milestone Decision Authority (MDA)/Defense Acquisition Executive (DAE),
- The Component Acquisition Executive (CAE)/Program Executive Officer (PEO) and Science and Technology (S&T) Executive,
- The Program Manager (PM),
- The Assistant Secretary of Defense for Research and Engineering (ASD(R&E)), and
- The team of independent subject matter experts (SMEs).

#### **2.2 Roles and Responsibilities**

Key player roles and responsibilities are as follows:

- **The MDA**
  - Determines whether to approve the Milestone decision or to defer until technology matures.
  - Determines whether or not the technologies of the program can be certified under 10 U.S.C. § 2366b based on independent review and assessment by ASD(R&E), which review and assessment are informed, in part, by the program TRA.
  - In case of technologies not demonstrated in a relevant environment, determines whether the PM's proposed risk-mitigation plans are adequate and, in turn, determines whether to issue a waiver under 10 U.S.C. § 2366b.
  - With the user, determines if risk can be reduced to an acceptable level by relaxing program requirements.

- **The CAE/PEO and S&T Executive**

- Approves the PM's TRA plan and assigns additional participants as desired.
- Reviews and approves the list of critical technologies that pose potential risk to program success and that are to be assessed in the TRA.
- Reviews and approves the TRA final report and cover memorandum and includes any additional material desired.
- Transmits the completed TRA to ASD(R&E).
- Raises any issues that cannot be resolved with the ASD(R&E) to the MDA.

The CAE may choose to make the Service S&T Executive a key participant in the TRA process. For example, the CAE may direct the S&T Executive to take responsibility for TRA management and execution. The CAE may assign the S&T Executive as a reviewer/signatory on MDAP Technology Development Strategies (TDSs) to support identification and management of critical technologies leading up to MS B.

- **The PM**

- Assesses the technological risk in his/her program.
- Plans and ensures funding of the program's risk-reduction activities to ensure that technologies reach the appropriate maturity levels prior to being incorporated into the program baseline design. A key benchmark is that the technologies of the program be demonstrated in a relevant environment at MS B or at a subsequent Milestone if there is no MS B for this program. If this benchmark is not achieved, a waiver by the MDA is possible, but this waiver must be based on acceptable means of risk mitigation, such as inclusion of an alternative more mature technology as a funded option.
- Prepares a plan for conduct of the TRA. Receives approval of the plan through CAE and PEO and provides the plan to ASD(R&E) upon approval by the CAE.
- Funds the TRA and ensures that it is properly carried out.
- Prepares a draft TRA schedule and incorporates the approved version in the program's Integrated Master Plan (IMP) and Integrated Master Schedule (IMS). A draft TRA should be completed prior to the MDA Defense Acquisition Board (DAB) Pre-MS B Program Review that precedes EMD RFP release and MS B. After Preliminary Design

Review (PDR) and prior to MS B or another certification decision event, the TRA will be updated as needed based on the PDR and source-selection results to ensure that knowledge obtained at PDR and in the proposals is available to inform the ASD(R&E).

- In consultation with ASD(R&E) and with PEO and CAE approval, identifies the subject matter expertise needed to perform the TRA.
  - Assigns members of the SME team and informs the CAE, PEO, ASD(R&E), and S&T Executive of the final membership.
  - Familiarizes the SME team with the program, the performance and technical requirements, and the designs under consideration.
  - Identifies possible critical technologies for consideration by the SME team.
  - Provides evidence of technology demonstration in relevant environments to the SME team for assessment, including contractor data as needed.
  - Provides proposed risk-mitigation plans to address remaining technological risk associated with critical technologies to the SME team, independent of levels of demonstration.
  - Provides technical expertise to the SME team as needed.
  - Prepares the TRA report that will include findings, conclusions, and other pertinent material prepared by the SMEs.
  - Prepares the TRA report cover memorandum, which may include additional technical information deemed appropriate to support or disagree with SME team findings.
  - Sends the completed TRA, with SME team comments unaltered, through the PEO to the CAE for review and transmittal to ASD(R&E), together with any additional information the CAE chooses to provide.
  - Determines whether a waiver to the § 2366b certification requirement may be appropriate, and if so, requests PEO and CAE approval to request such a waiver.
- **The ASD(R&E)**
    - Reviews the TRA plan provided by the PM and provides comments regarding TRA execution strategy as appropriate.

- In conjunction with the PM and SME team, reviews the PM-provided list of critical technologies to assess and recommends additions or deletions.
  - Based on the TRA final report, inter alia, provides the MDA an independent assessment and review concerning whether the technology in the program has been demonstrated in a relevant environment.
  - If a § 2366b waiver has been requested, provides a recommendation to the MDA, with supporting rationale, as to whether a waiver should be granted.
  - Recommends technology maturity language for an Acquisition Decision Memorandum (ADM), noting, in particular, conditions under which new technology can be inserted into the program.
- **The SME Team**
    - Works closely with the PM throughout the TRA process.
    - Reviews the performance, technical requirements, and designs being considered for inclusion in the program.
    - In conjunction with the PM and ASD(R&E), reviews the PM-provided list of critical technologies to assess and recommends additions or deletions.
      - – The SME team should make recommendations to the PM (with associated rationale) on the candidate technologies that should be assessed in the TRA.
    - Assesses whether adequate risk reduction to enter EMD (or other contemplated acquisition phase) has been achieved for all technologies under consideration, including, specifically, demonstration in a relevant environment.
      - – The assessment should be based on objective evidence gathered during events, such as tests, demonstrations, pilots, or physics-based simulations. Based on the requirements, identified capabilities, system architecture, software architecture, concept of operations (CONOPS), and/or the concept of employment, the SME team will evaluate whether performance in relevant environments and technology maturity have been demonstrated by the objective evidence.



- If demonstration in a relevant environment has not been achieved, the SMEs will review the risk-mitigation steps intended by the PM and make a determination as to their sufficiency to reduce risk to an acceptable level.
- TRLs will be used as a knowledge-based standard or benchmark but should not substitute for professional judgment tailored to the specific circumstances of the program.
- Prepares the SME comments in the TRA report including (1) the SME team credentials and (2) SME team findings, conclusions, and supporting evidence.

## **2.3 Process for Conducting a TRA**

### **2.3.1 Establish a TRA Plan and Schedule**

The TRA planning process begins when the PM establishes a plan for conducting the TRA, typically after MS A. After the TRA plan is approved by the PEO and CAE, it is provided to ASD(R&E) by the PM. The TRA plan should include a schedule that aligns with the Acquisition Strategy (AS), and it should be incorporated into the program's IMS. When a pre-MS B DAB Program Review is conducted prior to the release of the EMD RFP, a draft TRA will be reviewed and approved by the PEO and CAE and provided to the ASD(R&E) 30 days before the pre-MS B DAB Program Review. The TRA should be finalized after PDR and at least 30 days before MS B.

### **2.3.2 Form a SME Team**

Once a TRA schedule has been established, a team of SMEs should be formed. Subject matter expertise and independence from the program are the two principal qualifications for SME team membership. Members should be experts who have demonstrated, current experience in the relevant fields. It is the PM's responsibility to guide SME team members on their role in the TRA process, as provided for in the TRA plan. The PM should include an overview of the system, an overview of the TRA process, criteria for identifying critical technologies, and examples and instructions for determining whether technologies have been demonstrated in a relevant environment. The PM should exploit planned demonstration events and tests to provide the data needed by the SME team. SME team members might be required to sign non-disclosure agreements and declare that they have no conflicts of interest.

### **2.3.3 Identify Technologies To Be Assessed**

The fundamental purposes of the TRA are (1) to provide the PM with a comprehensive assessment of technical risk, and (2) to support the ASD(R&E)'s

independent assessment of the risk associated with the technologies incorporated in the program—including whether the technologies of the program have been demonstrated in a relevant environment—so that the MDA is informed as to whether certification under *10 U.S.C. §2366b* can be accomplished, whether a waiver is appropriate, and whether risk-mitigation plans are adequate. Thus, it is important to identify all appropriate technologies that bear on that determination. These technologies should be identified in the context of the program’s systems engineering process, based on a comprehensive review of the most current system performance and technical requirements and design and the program’s established technical work breakdown structure (WBS).

Technology risk identification should start well before the formal TRA process. In fact, potential critical technology identification begins during the Materiel Solution Analysis (MSA) phase, which precedes MS A. An early evaluation of technology maturity, conducted shortly after MS A, may be helpful to refine further the potential critical technologies to be assessed. It may be appropriate to include high-leverage and/or high-impact manufacturing technologies and life-cycle-related technologies if there are questions of maturity and risk associated with those technologies.

The PM should prepare an initial list of potential technologies to be assessed. When competing designs exist, the PM should identify possible technologies separately for each design. The PM should make key technical people available to the SME team to clarify information about the program.

The SME team should recommend changes to the list of critical technologies to assess to the PM. Inputs to this process include the list of technologies developed by the PM and specific technical planning performed by existing or previous contractors or government agencies. The SME team should be given full access to these data.

### **2.3.4 Collect Evidence of Maturity**

Appropriate data and information are needed to assess whether the technologies of the program have been demonstrated in a relevant environment. The process of collecting and organizing the material for each technology should begin as early as possible. The PM should compile component or subsystem test descriptions, environments, and results in the context of the system’s functional needs as needed to conduct his/her own assessment of technology maturity and as needed by the SME team to complete its work. Any other analyses and information necessary to assess and rationalize the maturity of the technologies should also be included.

### **2.3.5 Assess Technology Maturity**

#### **2.3.5.1 SME Team Assessment**

The PM must make key data, test results, and technical people available to the SME team to clarify information about the program. The SME team should assess critical technologies to determine whether these technologies have been demonstrated in a relevant environment and whether risk has been reduced or can be reduced to an acceptable level for inclusion in an EMD program. Before the assessment process begins, the SME team must ensure a sufficient understanding of the requirements, identified capabilities, system and software architectures, CONOPS, and/or the concept of employment to define the relevant environments. The SME team must also ensure that its understanding of design details is sufficient to evaluate how the technologies will function and interface.

### **2.3.5.2 Prepare, Coordinate, and Submit the TRA Report**

The CAE will submit a draft TRA report to ASD(R&E) 30 days prior to the Pre-MS B DAB Program Review. An update will be submitted after PDR and source selection and before formal MS B or other certification decision event. Generally, the TRA report should consist of (1) a short description of the program; (2) a list of critical technologies that pose a potential risk of program execution success, with the PM's assessment of the maturity of those technologies as demonstrated in a relevant environment and a description of any risk-mitigation plans; (3) the SME team membership and credentials; (4) SME team findings, conclusions, supporting evidence, and major dissenting opinions; and (5) a cover letter signed by the CAE approving the report; forwarding any requests for waivers of the §2366b certification requirement with supporting rationale, and providing other technical information deemed pertinent by the CAE and PM. The CAE and PM can provide any supplemental material as desired.

The TRA report should present the evidence and rationale for the final assessment. Evidence could include records of tests or applications of the technology, technical papers, reports, presentations, and so forth. It should explain how the material was used or interpreted to make the assessment. The report should reference the sources and the pages in these sources for the evidence presented in the report to determine whether a technology has been demonstrated in a relevant environment. The material should explain the function of each technology at the component, subsystem, and system levels. The report should also contain an explicit description of the program increments or spirals covered if appropriate and relevant to the Milestone decision.

### **2.3.5.3 ASD(R&E) Review and Evaluation**

ASD(R&E) will evaluate the TRA in consultation with the CAE and the PM. ASD(R&E) will provide the MDA an independent assessment of technology maturity based on this process.

ASD(R&E) will prepare a memorandum that contains the evaluation results of the TRA. The memo will summarize ASD(R&E)'s determination as to whether the technologies of the program have been demonstrated in a relevant environment; if not, whether or not a waiver is acceptable; and a recommendation on the adequacy of risk-mitigation plans and the readiness of the program to proceed to the next stage of the acquisition process.

The memorandum is sent to the MDA, with copies to the Overarching Integrated Product Team (OIPT), the CAE, and the PM.

## **2.4 Submitting a TRA**

### **2.4.1 Skeletal Template for a TRA**

The TRA report should consist of (1) a short description of the program; (2) a list of critical technologies that pose a potential risk of program execution success, with the PM's assessment of the maturity of those technologies as demonstrated in a relevant environment and a description of any risk-mitigation plans; (3) the SME team membership and credentials; (4) SME team findings, conclusions, supporting evidence, and major dissenting opinions; and (5) a cover letter signed by the CAE approving the report; forwarding any requests for waivers of the §2366b certification requirement with supporting rationale, and providing other technical information deemed pertinent by the CAE and PM. The CAE and PM can provide any supplemental material as desired.

The following outline is a skeletal template for TRA submissions:

- 1.0 Purpose of This Document**
- 2.0 Executive Summary**
- 3.0 Program Overview**
  - 3.1 Program Objective**
  - 3.2 Program Description**
  - 3.3 System Description**
- 4.0 Program Technology Risks Summary and Readiness Assessment**
  - 4.1 Process Description**
  - 4.2 Identification of Technologies Assessed**
  - 4.3 PM's and SME Team's Assessments of Technology Risk and Technology Demonstration in a Relevant Environment**
    - 4.3.1 First Technology**

### **4.3.2 Next Technology**

## **5.0 Summary**

## **2.4.2 Annotated Template for a TRA (Recommended or Nominal Length of Section)**

The following outline is an annotated version of the TRA template.

### **1.0 Purpose of This Document (One Paragraph)**

Provides a short introduction that includes the program name, the system name if different from the program name, and the Milestone or other decision point for which the TRA was performed. For example, “This document presents an independent TRA for the UH-60M helicopter program in support of the MS B decision. The TRA was performed at the direction of the UH-60M Program Manager.”

### **2.0 Executive Summary (One Page)**

### **3.0 Program Overview**

#### **3.1 Program Objective (One Paragraph)**

States what the program is trying to achieve (e.g., new capability, improved capability, lower procurement cost, reduced maintenance or manning, and so forth). For MS B, refers to the Capability Development Document (CDD) that details the program objectives.

#### **3.2 Program Description (One Page or Less)**

Briefly describes the program or program approach—not the system. Does the program provide a new system or a modification to an existing operational system? Is it an evolutionary acquisition program? If so, what capabilities will be realized by increment? When is the Initial Operational Capability (IOC)? Does it have multiple competing prime contractors? Into what architecture does it fit? Does its success depend on the success of other acquisition programs?

Also, explicitly identifies the program increments or spirals covered by the TRA, if relevant.

#### **3.3 System Description (Nominally 5 Pages)**

Describes the overall system, the major subsystems, and components to give an understanding of what is being developed and to show what is new, unique, or special about them. This information should include the systems, components, and technologies to be assessed. Describes how the system works (if this is not obvious).

## **4.0 Program Technology Risks Summary and Readiness Assessment**

### **4.1 Process Description (Nominally 2 Pages)**

Tells the composition of the SME team and what organizations or individuals were included. Identifies the special expertise of these participating organizations or individuals. This information should establish the subject matter expertise and the independence of the SME team. Members should be experts in relevant fields. Usually, the PM will provide most of the data and other information that form the basis of a TRA.

Tells how technologies to be assessed were identified (i.e., the process and criteria used and who identified them). States what analyses and investigations were performed when making the assessment.

### **4.2 Identification of Technologies Assessed (as Needed)**

Lists the technologies included in the TRA and why they were selected as critical. Describes the relevant environment in which each technology was assessed. Normally, this would be the operational environment in which the system is intended to perform; however, this can be adjusted if the technology's environment will be controlled while it operates in the system in question. Includes a table that lists the technology name and includes a few words that describe the technology, its function, and the environment in which it will operate. The names of these technologies should be used consistently throughout the document.

Includes any technologies that the SME team considers critical and that have not been included in previously fielded systems that will operate in similar environments.

Note that the technologies of interest here are not routine engineering or integration risk elements. They are items that require more than the normal engineering development that would occur in design for production as opposed to technology maturation programs.

### **4.3 PM's and SME Team's Assessments of Technology Risk and Technology Demonstration in a Relevant Environment (as Needed)**

#### **4.3.1 First Technology**

Describes the technology. Describes the function it performs and, if needed, how it relates to other parts of the system. Provides a synopsis of development history and status. If necessary, this synopsis can include facts about related uses of the same or similar technology, numbers of hours breadboards were tested, numbers of prototypes built and tested, relevance of the test conditions, and results achieved.

Describes the environment in which the technology has been demonstrated. Provides a brief analysis of the similarities between the demonstrated environment and the intended operational environment.

States whether the assessed technology has been demonstrated in a relevant environment or not.

Provides data, including references to papers, presentations, data tables, and facts that support the assessments as needed. These references/tables/graphs can be included as an appendix.

Provides a summary of planned risk-mitigation activities showing how those activities will reduce the risk of the technology to acceptable levels.

Provides the SME team's concurrence or non-concurrence and the rationale therefore, and the SME team's assessment of the adequacy of proposed risk mitigation plans.

#### **4.3.2 Next Technology**

For the other technologies assessed, this paragraph and the following paragraphs (e.g., 4.3.3, 4.3.4, and so forth) present the same type of information that was presented in paragraph 4.3.1.

#### **5.0 Summary (One Page)**

Includes a table that lists the technologies that were assessed, the degree of risk associated with each, recommended mitigation measures if any, and whether each was demonstrated in a relevant environment. Summarizes any technologies for which the PM and the SME team are in disagreement as to the degree of risk or whether the technology has been demonstrated in a relevant environment.



## 2.5 TRL Definitions, Descriptions, and Supporting Information

| TRL | Definition  | Description   | Supporting Information  |
|-----|---|---|---|
| 1   | Basic principles observed and reported.   | Lowest level of technology readiness. Scientific research begins to be translated into applied research and development (R&D). Examples might include paper studies of a technology's basic properties.   | Published research that identifies the principles that underlie this technology. References to who, where, when.  |
| 2   | Technology concept and/or application formulated.                                     | Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative, and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.                                    | Publications or other references that outline the application being considered and that provide analysis to support the concept.  |
| 3   | Analytical and experimental critical function and/or characteristic proof of concept. | Active R&D is initiated. This includes analytical studies and laboratory studies to physically validate the analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.                               | Results of laboratory tests performed to measure parameters of interest and comparison to analytical predictions for critical subsystems. References to who, where, and when these tests and comparisons were performed.  |
| 4   | Component and/or breadboard validation in a laboratory environment.                   | Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared with the eventual system. Examples include integration of "ad hoc" hardware in the laboratory.  | System concepts that have been considered and results from testing laboratory-scale breadboard(s). References to who did this work and when. Provide an estimate of how breadboard hardware and test results differ from the expected system goals.   |
| 5   | Component and/or breadboard validation in a relevant environment.                     | Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so they can be tested in a simulated environment. Examples include "high-fidelity" laboratory integration of components. | Results from testing laboratory breadboard system are integrated with other supporting elements in a simulated operational environment. How does the "relevant environment" differ from the expected operational environment? How do the test results compare with expectations? What problems, if any, were encountered? Was the breadboard system refined to more nearly match the expected system goals? |
| 6   | System/subsystem model or prototype demonstration in a relevant environment.          | Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity                                     | Results from laboratory testing of a prototype system that is near the desired configuration in terms of performance, weight, and volume. How did the test environment differ from the operational environment? Who performed the tests? How did the test compare with expectations? What problems, if any, were encountered? What are/were the plans, options, or  |

**TRL Definitions, Descriptions, and Supporting Information (Continued)**

| TRL | Definition  | Description  | Supporting Information  |
|-----|---|--|---|
|     |   | laboratory environment or in a simulated operational environment.  | actions to resolve problems before moving to the next level?  |
| 7   | System prototype demonstration in an operational environment.         | Prototype near or at planned operational system. Represents a major step up from TRL 6 by requiring demonstration of an actual system prototype in an operational environment (e.g., in an aircraft, in a vehicle, or in space).   | Results from testing a prototype system in an operational environment. Who performed the tests? How did the test compare with expectations? What problems, if any, were encountered? What are/were the plans, options, or actions to resolve problems before moving to the next level?  |
| 8   | Actual system completed and qualified through test and demonstration. | Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation (DT&E) of the system in its intended weapon system to determine if it meets design specifications. | Results of testing the system in its final configuration under the expected range of environmental conditions in which it will be expected to operate. Assessment of whether it will meet its operational requirements. What problems, if any, were encountered? What are/were the plans, options, or actions to resolve problems before finalizing the design? |
| 9   | Actual system proven through successful mission operations.           | Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation (OT&E). Examples include using the system under operational mission conditions.  | OT&E reports.   |

## **List of Acronyms**

|          |   |
|----------|---|
| ACAT     | Acquisition Category  |
| AS       | Acquisition Strategy  |
| ASD(R&E) | Assistant Secretary of Defense for Research and Engineering |
| ADM      | Acquisition Decision Memorandum                             |
| CAE      | Component Acquisition Executive                             |
| CDD      | Capabilities Development Document                           |
| CONOPS   | Concept of Operations                                       |
| DAE      | Defense Acquisition Executive                               |
| DAB      | Defense Acquisition Board                                   |
| DoDI     | Department of Defense Instruction                           |
| DSAB     | Defense Space Acquisition Board                             |
| DT&E     | Developmental Test and Evaluation                           |
| EMD      | Engineering and Manufacturing Development                   |
| IMP      | Integrated Master Plan                                      |
| IMS      | Integrated Master Schedule                                  |
| IOC      | Initial Operational Capability                              |
| MDA      | Milestone Decision Authority                                |
| MDAP     | Major Defense Acquisition Program                           |
| MAIS     | Major Automated Information System                          |
| MS       | Milestone   |
| MSA      | Material Solution Analysis                                  |
| OIPT     | Overarching Integrated Product Team                         |
| OT&E     | Operational Test and Evaluation                             |
| PEO      | Program Executive Officer                                   |
| PDR      | Preliminary Design Review                                   |
| PM       | Program Manager   |
| R&D      | Research and Development                                    |
| RFP      | Request for Proposal  |
| S&T      | Science and Technology                                      |
| SME      | Subject Matter Expert                                       |
| TDS      | Technology Development Strategy                             |

|           |  |
|-----------|--|
| TRA       | Technology Readiness Assessment  |
| TRL       | Technology Readiness Level   |
| U.S.C.    | United States Code   |
| USD(AT&L) | Under Secretary of Defense for Acquisition, Technology,<br>and Logistics |
| WBS       | Work Breakdown Structure   |
| WSARA     | Weapons Systems Acquisition Reform Act                                   |