Automated Information System (AIS) Test and Evaluation (T&E)

References: Refer to Enclosure 1.

1. PURPOSE.

   a. This instruction establishes the policy and procedures associated with the management, execution, and staff supervision of Defense Logistics Agency (DLA) AIS Test and Evaluation. The T&E process is used within DLA to support AIS milestone decisions for major or less than major - Acquisition Category (ACAT) IA and ACAT III) AIS acquisitions. The term AIS is defined as a combination of computer hardware, software, data, or communications that perform functions such as collecting, processing, transmitting, and displaying information. AIS development programs shall be designed to allow for the T&E of each program phase and milestone. Final deployment shall be based on the successful completion of all milestone T&Es.

   b. Prior to fielding an AIS, it must be tested by the appropriate functional expert(s) and the test community under realistic conditions to determine that the product meets the established goals. DLA will adhere to Department of Defense Instruction (DODI) 5000.02, Operation of the Defense Acquisition System, which lays out a detailed T&E process for the acquisition of new systems and capabilities, i.e., System, Regression, 508 Compliance, Performance Stress, and Security Testing. This process ensures testing occurs throughout the development life cycle. It also ensures that problems are identified early enough in the development process to minimize the cost of corrective action, and serves as a risk mitigation technique to identify possible performance issues.

   c. The success of the process is measured by the ability of Program Managers (PM) to field operationally suitable AISs within cost and schedule constraints.

   d. Measures of Effectiveness (MOE) and Suitability (MOS) - Critical Operating Issues (COI) are derived from user-determined functional requirements. When all MOEs and MOSs for a COI are satisfied, the threshold for that COI is satisfied.

2. APPLICABILITY. This DLA Instruction applies to all DLA Headquarters and Field Activities information technology (IT) investment programs.
3. **DEFINITIONS.** Refer to the Glossary for terms related to the T&E process.

4. **POLICY.**

   a. Unless waived by the Milestone Decision Authority (MDA), no new AIS major modification to an existing AIS will be approved for production, procurement or installation, or until it has been adequately tested, proven operationally suitable and effective, identified as safe for use, determined to be supportable, ensured to be secured, and if applicable, certified for interoperability. All AISs must be certified and accredited for information assurance prior to going into production. All major modifications to AIS must be assessed to ensure the security posture remains at an acceptable level as certified and accredited by the Designated Accrediting Authority. If the major modification affects the AIS’ security posture it may require recertification and accreditation of the system.

   b. T&E planning shall begin in pre-systems acquisition during materiel solution analysis and technology development phases. Developmental and operational testers must be involved and remain throughout the process to ensure that the test program supports the acquisition strategy and to ensure synchronization of objectives, thresholds, and MOEs in the program’s existing documents (Initial Capabilities Document (ICD), Capabilities Development Document (CDD), Capability Production Document (CPD), and Test and Evaluation Master Plan (TEMP). T&E planning shall address MOEs and Measures of Performance (MOP) with appropriate quantitative criteria, test event or scenario description, resource requirements, and test limitations. While the testing and evaluation of AIS functional and operational capabilities are of measured importance, the successful Security T&E (ST&E) of the AIS security controls is also imperative and should be documented as cited in DODI 8510.01, DOD Information Assurance Certification and Accreditation Process and documented in the Enterprise Mission Assurance Support Service (EMASS). In addition, System, Regression, 508 Compliance, and Performance Stress Testing must be included.

   c. The PM, along with the Test Director, will determine the scope and objectives to include cost, schedule, and performance of the AIS. The test plan, at a minimum, must address all system components (hardware, software, and human interfaces) that are critical to the success of well-defined technical performance specifications, operational effectiveness and suitability, and security requirements.

   d. Metrics will be collected to provide validation of hardware, software, and readiness to proceed through the acquisition process.

   e. Appropriate operational testing must be complete before entering full deployment.

   f. Sufficient testing must be conducted on commercial and non-developmental items to ensure the system is operationally effective, suitable, and secure for the planned application. Test planning for these items must include consideration of operational testing necessary to assure effective performance in the intended operational environment.
g. Testing must be planned and conducted to take full advantage of existing investment in facilitating other resources wherever practical, unless otherwise justified in the TEMP and approved by the PM.

h. Testing shall be conducted early in the technology development phase and early operational assessments shall be emphasized to assist in identifying risks.

i. Where possible, modeling and simulation can be used as an integral part of T&E planning.

j. A combined Developmental Test and Operational Test (DT/OT) approach can be used to achieve time and cost savings. A final independent phase of Program Executive Officer (PEO) approved Operational T&E will be required for full deployment decisions.

k. All systems having joint interoperability requirements, regardless of ACAT, must be tested and certified by the Joint Interoperability Test Command (JITC-IH). This testing may be performed in conjunction with other testing (i.e., Development Test and Evaluation (DT&E), Operational Test and Evaluation (OT&E), early user tests, etc.) whenever possible to conserve resources. All systems are required to be recertified every 4 years by CJCSI 6212.01F.

l. Memoranda of Agreements must be established where interface(s) exists.

m. DLA programs that have been approved by the PEO to implement the Business Capability Lifecycle (BCL) will follow the DOD guidance provided by Directive Type Memorandum (DTM) 11-009, Acquisition Policy for Defense Business Systems (DBS)

4. RESPONSIBILITIES.

a. The PM must establish a T&E Working Integrated Product Team (WIPT). The PM must appoint a Test Lead (TL) and designate the chair of the T&E WIPT.

b. Appropriate representatives from the PEO, test community, and the user community should participate in all T&E activities. The Enterprise Business System (EBS) Test Director shall provide general testing oversight and guidance to other DLA emerging systems PMs. For Office of the Secretary of Defense (OSD) oversight programs, the group must include representatives from the OSD test community.

c. The systems PM/Project Lead (PL) must establish contact with the EBS Test Director early in the program life cycle after entering Milestone A to determine an overall test strategy and develop the TEMP. The TEMP must include certification requirements, testing responsibilities, and appropriate type and level of testing consistent with program complexity and risk. The TEMP must address ST&E in parallel with any DT&E and/or OT&E performed (see DOD 8510.01). The template for the TEMP content is contained in the Defense Acquisition Guidebook.

d. The PL must ensure that test documents, especially the ICD/CPD/CDD and TEMP, are reviewed and approved by the EBS Test Director, PM, PEO, or designated representative, and other appropriate authorities.
e. Conduct Development Testing. The PL, in conjunction with their TL, will assign developmental T&E responsibilities and coordinate developmental testing of the system. The TL must coordinate requirements for test facilities and technical expertise in support of T&E activities and must conduct developmental testing.

f. PL/TL ensures test planning during DT&E is a vital stage of the software development life cycle and is necessary to ensure that every step of the DT&E test process has been considered and planned. The DT&E test planning must include detailed descriptions of tests to be accomplished; this should include real-life complex scenarios, detailed scripts, and realistic data that thoroughly test the business requirements of the system.

g. The PM and Test Director will identify and coordinate, where appropriate, with an independent tester for the OT&E activities and interoperability testing. Information systems with interoperability requirements, JTC - Indian Head will provide system interoperability test certification and net-ready certification memoranda to the Director, Joint Staff, and DLA Information Operations, throughout the system life cycle and regardless of ACAT.

h. The PM is responsible for obtaining Information Assurance Manager (IAM) involvement from the very beginning of the program.

5. PROCEDURES. Refer to Enclosure 2.

6. EFFECTIVE DATE: This Instruction:


b. Must be reissued, cancelled, or certified current within 5 years of its publication in accordance with DLAI 5025.01, DLA Issuance Program. If not, it will expire effective May 28, 2023 and be removed from the DLA Issuances Website.
ENCLOSURE 1

REFERENCES


c. DODI 8510.01, DOD Information Assurance Certification and Accreditation Process, November 28, 2007.

d. Title 10, USC, SEC. 2399, Operational Test and Evaluation of Defense Acquisition Programs
1. The ICD, CDD, or CPD as appropriate, identifies program requirements. The testing process validates that a system fulfills or addresses all requirements.

2. The TEMP, a collaborative effort involving test groups, Service/Agency focal points, and subject matter experts, shall focus on the overall structure, major elements, and objectives of the T&E program and is consistent with the acquisition strategy. The TEMP is a roadmap through the various phases of testing and must be prepared as prescribed by current DOD T&E directives. The Milestone A T&E Strategy and Milestone B and C TEMP for a system using evolutionary (incremental or spiral) acquisition shall address each increment intended for fielding. Whenever possible, PMs will integrate DT&E with OT&E into an integrated TEMP that reduces testing resource requirements and time or will conduct DT&E and OT&E concurrently. The PM may recommend DT&E and OT&E be combined into a single test event, providing data to developmental and operational evaluators equally. The PM should consider use of Operational Assessments (OA) where appropriate. There is no single solution that is optimal for all programs, but each program should consider these approaches during T&E planning.

3. Independent operational test activities (OTA), e.g., JITC, shall participate in early program development to provide operational testing insights to the program office and decisionmakers.

4. The PM and Test Director will assess compliance with critical technical parameters, identify technological and design risks, and determine readiness to proceed to the appropriate testing event.

5. The Test Director will provide data to verify that the operationally effective and suitable systems are approved for production and fielding and to verify that system meets mission needs and minimum operational performance requirements. The PM will ensure that all defects are resolved.

6. Continuous Evaluation (CE). The PM will use CE to provide timely and effective assessments of an AIS status. CE should begin as early as materiel solution analysis and continue through operations and support life cycle phases.

7. Concurrent Developmental and Operational Testing. Concurrent DT&E and OT&E may be used to shorten system development time. In concurrent testing, both developmental and operational testing is conducted during test events overlapping in time. Before operational testing occurs, sufficient developmental testing must be accomplished to ensure readiness for operational testing and safety certification. Independent OT&E efforts will be conducted separately. Concurrent testing requires effective coordination between the developmental and operational (e.g., JITC) testing organizations to ensure test phase criteria are satisfied without invalidating the results from previous testing efforts. Normally, this can be accomplished by developing detailed testing plans where testing conditions and criteria are specified in their proper sequence(s) and reviewed and approved by the testing organizations involved.
8. Testing Commercial Off-the-Shelf (COTS) products. COTS items shall be tested and evaluated. The scope of T&E will be determined by the PM, test director, and Operational Test Authority (OTA) based on documented test data from commercial and Government sources and on the extent of COTS modifications. The TEMP will reference COTS testing, if required.

9. Conduct formal DT&E. The scope of DT&E may vary according to the acquisition strategy, complexity of the system being developed, and the software development strategy. DT&E is composed of a series of tests and events that demonstrate the engineering design and developmental process is complete, that design risks have been minimized and that the system performs as technically specified. The PM or Test Director will perform tests in the following categories: design testing, integration testing, qualification testing, interoperability testing, information assurance, and usability and accessibility testing, at a minimum.

10. Independent Verification and Validation (IV&V). The PM will include IV&V as a risk reduction technique for program development to ensure hardware, software, and interfaces meet requirements for functional effectiveness and technical sufficiency.

11. Production and Deployment Phase Testing. Testing in the production and deployment phase is generally used to verify major software baseline changes.

12. System Testing. System testing is an end-to-end developmental test conducted on a mature, integrated system to establish a baseline or to verify changes to a previously established baseline (e.g., regression testing). System testing is usually conducted by the designated test activity or system developer and is conducted in a test environment. System testing normally consists of multiple phases. Each phase of testing must be completed before starting the next phase.

13. Functional/Acceptance Testing. Functional/acceptance testing is pre-operational testing to confirm specification compliance to include verification of performance and functionality under simulated operational conditions. Acceptance testing is the responsibility of the PM and is conducted in a test environment. It is the responsibility of the PM to ensure functional testing is completed by the functional user.

14. Environmental Testing. Environmental testing is a development test conducted by users to verify interoperability and functionality and to determine system performance under stressful conditions. User representatives conduct environmental testing in an operating environment using production data. In addition, environmental testing provides a means of certifying usability of the system for mission performance.

15. Operational Test Readiness Review (OTRR). The PM will conduct an OTRR before the start of Initial OT&E (IOT&E). The operational test authority and the PM will review the system readiness and identify problems that may adversely affect the test schedule or its conduct. The PM and Test Director shall establish maturity criteria and performance exit criteria necessary for certification for operational test. Risk management measures and indicators with associated thresholds addressing performance and technical adequacy of the infrastructure and system will be defined and documented. A mission impact analysis of criteria and thresholds that have not been met will be documented for the OTRR. The PM presents information asserting the system is ready to enter operational test to the MDA. The MDA will evaluate the
information provided by the PM and make a decision on the system’s readiness for OT&E. The results of the OTRR will be documented in a Milestone Decision Memorandum.

16. Conduct formal OT&E. An independent organization will conduct OT&E. OT&E consists of a dedicated test period performed on production or production-representative systems. OT&E will test operational effectiveness and operational suitability of the system to meet the DLA mission needs. OT&E will evaluate critical operational issues and minimum required operational performance requirements detailed in the TEMP.

17. Title 10, Restrictions of Modeling and Simulation. Title 10, USC, Sec. 2399, and DODI 5000.02 do not allow use of modeling and simulation alone to fulfill the requirements of an OT&E. However, early operational assessments may include models or simulations to assist in identifying risks. Modeling and simulation are not restricted as test management and planning tools to determine if live testing will be cost effective and produce the desired data.

18. The PM and Test Director shall structure OT&E to identify the operational effectiveness and suitability of a system under realistic conditions and to determine if the minimum acceptable operational performance requirements are satisfied. The following procedures are mandatory:

   a. Typical users shall operate and maintain the system under realistic conditions.

   b. The PM will provide the production-ready system operating in a production environment for conduct of Independent OT&E. The OTA observes testing and provides input to the deployment decision.

   c. All hardware and software alterations that materially change system performance (operational effectiveness and suitability) will be tested and evaluated. This includes system upgrades, as well as changes made to correct deficiencies identified during OT&E.

   d. OT&E shall be structured to take maximum advantage of training and exercise activities to increase the realism and scope of operational testing and to reduce testing costs.

   e. OT&E must be completed prior to making a full deployment decision.
### GLOSSARY

### DEFINITIONS

**Acquisition Category:**

Table 1. Description and Decision Authority for ACAT I – III Programs.

<table>
<thead>
<tr>
<th>Acquisition Category</th>
<th>Reason for ACAT Designation</th>
<th>Decision Authority</th>
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| ACAT I                | • MDAP (section 2430 of Reference (k))  
  o Dollar value: estimated by the USD(AT&L) to require an eventual total expenditure for research, development, test and evaluation (RDT&E) of more than $365 million in fiscal year (FY) 2000 constant dollars or, for procurement, of more than $2.190 billion in FY00 constant dollars  
  o MDA designation  
  • MDA designation as special interest  |
|                       | *ACAT IC: Head of the DOD Component or, if delegated, the CAE (not further delegable)*  |
| ACAT IA<sup>1,2</sup>  | • MAIS (Chapter 144A of Reference (k)): A DOD acquisition program for an Automated Information System<sup>3</sup> (either as a product or a service) that is either:  
  • Designated by the MDA as a MAIS; or  
  • Estimated to exceed:  
    o $32 million in FY00 constant dollars for all expenditures, for all increments, regardless of the appropriation or fund source, directly related to the AIS definition, design, development, and deployment, and incurred in any single FY; or  
    o $126 million in FY00 constant dollars for all expenditures, for all increments, regardless of the appropriation or fund source, directly related to the AIS definition, design, development, and deployment, and incurred from the beginning of the Materiel Solution Analysis Phase through deployment at all sites; or  
    o $378 million in FY00 constant dollars for all expenditures, for all increments, regardless of the appropriation or fund source, directly related to the AIS definition, design, development, deployment, operations and  |
|                       | *ACAT IAM: USD(AT&L) or designee*  |
|                       | *ACAT IAC: Head of the DOD Component or, if delegated, the CAE (not further delegable)*  |
maintenance, and incurred from the beginning of the Materiel Solution Analysis Phase through sustainment for the estimated useful life of the system.

- MDA designation as special interest

| ACAT II | Does not meet criteria for ACAT I
|         | Major system
|         |   - Dollar value: estimated by the DOD Component Head to require an eventual total expenditure for RDT&E of more than $140 million in FY00 constant dollars, or for procurement of more than $660 million in FY00 constant dollars (section 2302d of Reference (k))
|         |   - MDA designation\(^4\) (paragraph (5) of section 2302 of Reference (k))

| ACAT III | Does not meet criteria for ACAT II or above
|          | AIS that is not a MAIS

| CAE or the individual designated by the CAE\(^4\) | Designated by the CAE\(^4\) |

1. In some cases, an ACAT IA program, as defined above, also meets the definition of an MDAP. The USD(AT&L) shall be the MDA for such programs unless delegated to a DOD Component. The statutory requirements that apply to MDAPs and MAIS shall apply to such programs.

2. The MDA (either the USD(AT&L) or, if delegated, the ASD(NII)/DOD CIO or another designee) shall designate MAIS programs as ACAT IAM or ACAT IAC. MAIS programs shall not be designated as ACAT II.

3. Automated Information System: A system of computer hardware, computer software, data or telecommunications that performs functions such as collecting, processing, storing, transmitting, and displaying information. Excluded are computer resources, both hardware and software, that are:
   a. an integral part of a weapon or weapon system;
   b. used for highly sensitive classified programs (as determined by the Secretary of Defense);
   c. used for other highly sensitive information technology programs (as determined by the ASD(NII)/DOD CIO);
   d. determined by the USD(AT&L) or designee to be better overseen as a non-AIS program (e.g., a program with a low ratio of RDT&E funding to total program acquisition costs or that requires significant hardware development).

4. As delegated by the Secretary of Defense or Secretary of the Military Department.

Automated Information System: A combination of computer hardware and computer software, data, and/or telecommunications that performs functions such as collecting, processing, storing, transmitting, and displaying information.
Capabilities Development Document: A Capability Development Document (CDD) is a document that captures the information necessary to develop a proposed program(s), normally using an evolutionary acquisition strategy. The CDD outlines an affordable increment of militarily useful, logistically supportable, and technically mature capability. The CDD supports a Milestone B decision review.

Capabilities Production Document: A Capability Production Document (CPD) is the document that addresses the production elements specific to a single increment of an acquisition program. The CPD must be validated and approved before a Milestone C decision review. The refinement of performance attributes and Key Performance Parameters (KPP) is the most significant difference between the Capability Development Document (CDD) and CPD.

Critical Operating Issues: COIs are key operational effectiveness or suitability issues that must be examined in operational test and evaluation to determine the system's capability to perform its mission. COIs must be relevant to the required capabilities and of key importance to the system being operationally effective, operationally suitable and survivable, and represent a significant risk if not satisfactorily resolved.

Independent Verification and Validation: An independent review of software performed by an organization that is technically, managerially, and financially independent of the development organization.

Initial Capabilities Document: Documents the need for a materiel approach, or an approach that is a combination of materiel and non-materiel, to satisfy specific capability gap(s). The ICD defines the gap in terms of the functional area; the relevant range of military operations; desired effects; time and Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, and Facilities (DOTMLPF); and policy implications and constraints. The outcome of an ICD could be one or more DOTMLPF Change Recommendations or CDD.

Measures of Effectiveness: The data used to measure the mission accomplishment that comes from the use of the system in its expected environment.

Measures of Suitability: Measure of an item’s ability to be supported in its intended operational environment.

Milestone Decision Authority: Designated individual with overall responsibility for a program. The MDA shall have the authority to approve entry of an acquisition program into the next phase of the acquisition process and shall be accountable for cost, schedule, and performance reporting to higher authority, including congressional reporting.

Test and Evaluation Master Plan: Documents the overall structure and objectives of the T&E program. It provides a framework within which to generate detailed T&E plans and documents schedule and resource implications associated with the T&E program. The TEMP identifies the necessary DT&E and OT&E activities. It relates program schedule, test management strategy and structure, and required resources to: COIs, Critical Technical
Parameters, objectives and thresholds documented in the CDD, evaluation criteria, and milestone decision points.