

TEST AND EVALUATION

I. Purpose

This Directive prescribes implementing policies and procedures and assigns responsibilities for Test and Evaluation (T&E) activities to be performed throughout the system acquisition process.

II. Scope

This Directive applies throughout the Department of Homeland Security (DHS). Additionally, this Directive applies to the research, development and acquisition of all systems and subsystems.

III. Authorities

- A. Title 6, U.S.C., Section 181, "Under Secretary for Science and Technology," and Section 182, "Responsibilities and authorities of the Under Secretary for Science and Technology"
- B. Title 6, U.S.C., Section 188, "Conduct of research, development, demonstration, testing and evaluation"
- C. Title 6, United States Code (U.S.C.), Section 341, "Under Secretary for Management"
- D. DHS Delegation 10001, "Delegation to the Under Secretary for Science and Technology"
- E. DHS Directive 102-01, "Acquisition Management"
- F. DHS Management Directive 10100, "Organization of the Office of the Under Secretary for Science and Technology"

IV. Responsibilities

A. The **Under Secretary for Management**

1. Establishes and manages the Acquisition Management policy and procedures.
2. Assists the Under Secretary for Science and Technology in developing T&E policy.
3. Provides the Vice-Chair of the DHS T&E Council.
4. Establishes and maintains the DHS career-field certification program for T&E managers.

B. The **Under Secretary for Science and Technology** through the Director Test and Evaluation and Standards Division (TSD) and the TSD special assistant the Director of Operational Test and Evaluation (DOT&E) performs the following functions.

1. The **Director, Test and Evaluation and Standards Division**:
 - a. Develops and manages DHS T&E policy and procedures.
 - b. Recommends training, education and experience requirements to the Under Secretary for Management, for a DHS T&E manager certification program. Recommends periodic updates and revisions to certification standards and processes.
 - c. Advises the Component Program Managers in developing T&E documentation, planning for the T&E and in the resolution of T&E issues.
 - d. For Level 1, non-delegated Level 2, and special oversight acquisition programs, reviews the Concept of Operations, and Operational Requirements Document and associated Critical Operational Issues.
 - e. For Level 1, non-delegated Level 2, and special oversight acquisition programs, approves the Test and Evaluation Master Plans.
 - f. For Level 1, non-delegated Level 2, and special oversight acquisition programs, participates in T&E working groups. Program Levels are defined in Directive 102-01.

- g. For Level 1, non-delegated Level 2, and special oversight acquisition programs, reviews test plans and reports, and observe testing to maintain knowledge of Developmental Test and/or Contractor Test.
- h. Facilitates use of non-DHS facilities for testing and promote accreditation of T&E capabilities as appropriate.
- i. For Level 1, non-delegated Level 2, and special oversight acquisition programs, participates in Program and Design Reviews.
- j. Chairs the DHS T&E Council.

2. The **Director of Operational Test and Evaluation**:

- a. Advises the Component Program Managers in developing Operational T&E documentation, planning for the Operational T&E and in the resolution of T&E issues.
- b. For Level 1, non-delegated Level 2, and special oversight acquisition programs, reviews the Mission Need Statements, Concept of Operations, Integrated Logistic Support Plan, Operational Requirement Document and associated Critical Operational Issue.
- c. For Level 1, non-delegated Level 2, and special oversight acquisition programs, approves the Test and Evaluation Master Plan.
- d. For Level 1, non-delegated Level 2, and special oversight acquisition programs, approves the Operational Test Agent.
- e. For Level 1, non-delegated Level 2, and special oversight acquisition programs, participates in T&E working groups.
- f. For Level 1, non-delegated Level 2, and special oversight acquisition programs, participates in Operational Test Readiness Reviews, and observes Operational Tests.
- g. For Level 1, non-delegated Level 2, and special oversight acquisition programs, approves the Operational Test Plans and reviews the Operational Test and Evaluation Reports and writes Letter of Assessment of the Operational Test and Evaluation (OT&E) Report as appropriate.

h. For Level 1, non-delegated Level 2, and special oversight acquisition programs, provides the T&E member to the Acquisition Review Boards.

i. Provides a technical review of the Support Anti-terrorism by Fostering Effective Technologies (SAFETY) Act proposals and approval on the designation award.

C. **Component heads:**

1. Comply with the DHS acquisition and T&E policy;
2. May act as the Program Sponsor, Developer, and/or Operational Test Agent as appropriate; and
3. Ensure that adequate and timely T&E is performed to support informed Acquisition decision-making. At a minimum, the Component Acquisition Executive (CAE) considers test results for Low Rate Initial Production decisions, and an integrated evaluation of Developmental and Operational testing for Acquisition Decision Event (ADE) 3 decisions.

D. The **Sponsor** (sometimes known as the Proponent or User) defines the system's required operational characteristics in the Mission Needs Statement and Operational Requirement Document, and for identifying Critical Operational Issue and Key Performance Parameters in the Operational Requirement Document which provide the focus and direction of OT&E.

E. The **Program Manager**.

1. Is the Developer, and as such has overall responsibility for planning and executing the program's T&E strategy;
2. With Sponsor concurrence, identifies and recommends an Operational Test Agent for the program to conduct independent Operational Test and Evaluation; and
3. Provides for resourcing T&E activities, to include budgeting and funding; provision of test articles; and scheduling T&E activities into his or her program.

F. The ***Operational Test Agent*** plans, conducts, and reports independent operational test and evaluation of Level 1 and other selected DHS programs. The Operational Test Agent may be organic to the Component, another government agency, or a contractor but must be independent of the Developer and the development contractor. All OT&E are designed to provide the Acquisition Decision Authority (ADA) with an evaluation of the operational effectiveness and suitability of a system or service in a realistic, operational environment. The Operational Test Agent is identified and approved as early as possible in the acquisition process and will perform the following functions as appropriate. The Operational Test Agent:

1. Is involved early in the acquisition cycle, reviewing draft requirements documents for requirements that are testable and measurable. The Operational Test Agent provides feedback and recommendations to the Sponsor regarding the testability of proposed requirements.
2. Assists the Program Manager in the preparation of applicable portions of the Test and Evaluation Master Plan.
3. Plans, coordinates, and conducts realistic operational tests, and for preparation of the OT&E Report.
4. Conducts operational testing using typical trained operators and maintainers utilizing production or production-representative systems in a representative mission environment.
5. Should make use of qualified existing DHS and Department of Defense test resources, as well as the national labs and universities, whenever possible.
6. May use other government agencies or independent contractor support to help conduct the testing, collect the required data, or write the evaluation report.
7. Reports operational test and evaluation results to the ADA, the Program Manager, the Sponsor, and DOT&E.

V. Policy and Requirements

A. DHS acquisition programs, regardless of program level, use T&E as necessary and as required to support the development, procurement, deployment and operation of systems and services. The primary purpose of T&E is to provide timely, accurate information to managers, decision makers and other stakeholders to support research, development and acquisition, in a manner that reduces programmatic financial, schedule and performance risk. T&E provides information to support the:

1. Program Manager in identifying and resolving technical, logistical and operational issues early.
2. Decision maker responsible for approving the investment in, and procurement and deployment of safe, suitable and effective systems.
3. User, in understanding the characteristics, capabilities, limitations, operating requirements and utility of systems he or she will receive.
4. Components in establishing rulemaking.

B. T&E within the Acquisition Lifecycle Framework is shown in Figure 1, as defined in Directive 102-01 with key T&E events.

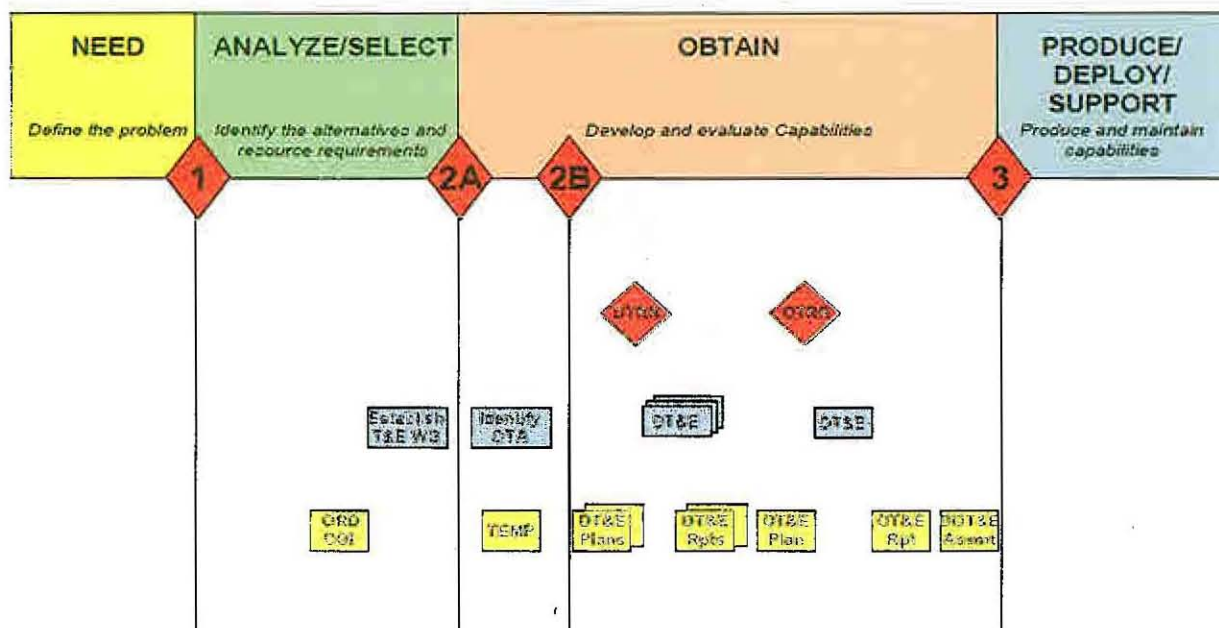


Figure 1 – T&E in the Acquisition Lifecycle

T&E planning begins with the start of Acquisition planning, in the pre-Acquisition phase [i.e. before-Acquisition Decision Event (ADE) 0]. T&E continues through the Produce/Deploy and Support Phase. Directive 102-01 provides a detailed description of the Acquisition lifecycle phases.

Programs may enter the Acquisition Life Cycle at any phase, as warranted by the circumstances of that Acquisition. A Program Manager is normally assigned upon an ADE 1 decision to proceed, and manages the program through the remaining life cycle phases, to include all of the necessary and required T&E.

The following briefly describes each of the Acquisition Life Cycle phases with an emphasis on how T&E supports each phase.

1. **Need.** The Need phase focuses on defining the problem and is led by the requirement organization, or Sponsor. The Sponsor conducts the operational analysis that expands into a Mission Needs Statement. The key products in this phase are:
 - a. Mission Need Statement that identifies and defines the capability gap(s), and
 - b. Capability Development Plan which describes how critical knowledge will be obtained during the Analyze/Select phase to support the ADE 2A decision.

The T&E related activity during this phase is generally limited to establishing awareness of the program. Consideration of programs at this early stage helps ensure that the required standards are developed and adequate accredited or recognized test capabilities are available when needed.

DHS DOT&E participates as a member of the Acquisition Review Board supporting the ADE 1 for Level 1, non-delegated Level 2, and special oversight programs. Approval by the ADA at ADE 1 authorizes entry into the Analyze/Select Phase. This decision point also designates the requirements for a Program Manager to take the program to the next ADE and assigns a Program Manager.

2. **Analyze/Select.** The Analyze/Select phase focuses on exploring alternative solutions for satisfying mission needs, establishing operational requirements and identifying resource requirements. Promising alternative solutions are normally defined in terms of cost, schedule and performance objectives; identification of interoperability, supportability, and infrastructure requirements; opportunities for tradeoffs; risk; and an overall acquisition strategy. The key products required in support of ADE 2A are:
 - a. Concept of Operations,

- b. Analysis of Alternatives,
- c. Operational Requirement Document,
- d. Acquisition Plan,
- e. Lifecycle Cost Estimate,
- f. Integrated Logistic Support Plan, and
- g. Acquisition Program Baseline.

The Sponsor or Program Manager prepares these documents and for Level 1, non-delegated Level 2, and special oversight acquisition programs, ensures DHS TSD and DOT&E are included on the distribution. DOT&E and the Operational Test Agent, if identified in time, review and comment on the Operational Requirements Document to ensure testability of requirements. The Operational Requirement Document should include the Critical Operational Issues that specifies the operational effectiveness and operational suitability issues that must be examined in OT&E to assess the system's capability to perform the mission. The Operational Requirement Document should specify any Key Performance Parameters. If the program is being developed as an evolutionary or phased acquisition, the Operational Requirement Document should specify the requirements and associated Key Performance Parameters for each block of development.

DHS DOT&E and the Operational Test Agent, if identified in time, also review and comment on the Concept of Operations and the Integrated Logistic Support Plan, as these documents are instrumental in planning and conducting a realistic OT&E.

The T&E related activity during this phase includes establishing a T&E Working Group that includes members from the Program Manager office, the Sponsor, test organizations, TSD and DOT&E. This working group helps in the development of potential T&E strategies and the elements of an initial draft Test and Evaluation Master Plan and ensures T&E costs are included in the Acquisition Cost estimate provided in the Life Cycle Cost Estimate. The Operational Test Agent is identified and approved as early as possible in the acquisition process, preferably during this phase so they are available to help draft the Test and Evaluation Master Plan.

DHS DOT&E participates as a member of the Acquisition Review Board supporting ADE 2A. Approval at ADE 2A authorizes entry into the Obtain Phase. A preferred acquisition alternative is also selected at this event, and funds for the next phase are approved. This decision point designates the Acquisition program level (e.g. Level 1, 2 or 3) and defines the role DHS TSD and DOT&E will play in the development process.

3. **Obtain.** The Obtain phase focuses on acquiring a capability that meets user requirements, and is ready to produce, deploy, and support. Testing and evaluation are among the most important aspects of this phase. The fundamental purpose of T&E in this phase is to refine the selected alternative and to demonstrate its operational effectiveness and suitability prior to a full production commitment at ADE 3. This is the primary phase where testing is conducted.

Depending upon the acquisition strategy, the Obtain phase may include one or more ADE 2B decisions to approve specific projects/blocks/increments within a program. However, ADE 2B event(s) may occur in conjunction with ADE 2A if there are one or more projects ready for approval at the same time as the program decision. For Level 1, non-delegated Level 2, and special oversight programs DHS S&T participates as a member of the Acquisition Review Board supporting the ADE 2B. The ADE 2B may be formal or virtual. The Acquisition Review Board also decides whether an additional ADE is required to authorize limited production quantities to support operational testing. The key documents supporting ADE 2B include the:

- a. Test and Evaluation Master Plan,
- b. Updated Acquisition Program Baseline,
- c. Updated Acquisition Plan, and
- d. Updated Integrated Logistic Support Plan.

For Level 1, non-delegated Level 2, and special oversight programs, DOT&E approves the Test and Evaluation Master Plan and ensures it adequately addresses both Developmental and Operational testing, the plan for an integrated evaluation, and the resources required for each. The Operational Test Agent also signs the Test and Evaluation Master Plan.

The Test and Evaluation Master Plan is the “top-level” planning document for all T&E related to a particular capital asset program or project. Its primary purpose is to describe the program’s T&E strategy in terms of the Developmental and Operational testing needed to determine system technical performance, and the strategy for evaluating the system’s operational effectiveness and suitability through an integrated assessment of that developmental and operational testing. Part 4 of the Test and Evaluation Master Plan identifies the Operational Test Agent that has been approved by DOT&E. This section may also state specific Entrance Criteria that must be met prior to the start of the Operational Test. The Test and Evaluation Master Plan also specifies the anticipated resources required to support all elements of the strategy. The Program Manager begins preparing the Test and Evaluation Master Plan as early in the program as possible, in accordance with the format provided in the Acquisition Management Guidebook. Test and Evaluation Master Plan approval should occur after approval of the Operational Requirement Document. The Program Manager prepares the Test and

Evaluation Master Plan in consultation with all organizations that are represented on the T&E Working Group. The Test and Evaluation Master Plan is reviewed and updated as required throughout the Obtain phase if significant changes in T&E strategy, schedule, or resource requirements occur. The approval authority for updates to the Test and Evaluation Master Plan is the same as the original.

Table 1 provides a summary of the acquisition program documents that require review and approval by TSD and DOT&E.

Document	Level I	Non-delegated Level II	Delegated Level II/ Non-oversight Level III
MNS	DOT&E Review	DOT&E Review	Component Responsibility
ORD	DOT&E Review	DOT&E Review	Component Responsibility
CONOPS	DOT&E Review	DOT&E Review	Component Responsibility
ILSP	DOT&E Review	DOT&E Review	Component Responsibility
TEMP	DOT&E/ Component Co Approve	DOT&E/ Component Co Approve	Component Responsibility
Operational Test Plans	DOT&E/Component Co Approve	DOT&E/Component Co Approve	Component Responsibility
DT&E and OT&E Reports	TSD and DOT&E Review	TSD and DOT&E Review	Component Responsibility

Table 1. DHS T&E Document Review/Approval

As a system proceeds through the various stages of design, development, and integration, the emphasis in T&E moves gradually from Developmental testing (which is concerned chiefly with validating the contract requirements and the attainment of engineering design goals and manufacturing processes), to OT&E, which focuses on questions of operational effectiveness and suitability. Where practicable without compromising either the Developmental or Operational Test objectives, Developmental and Operational testing should be accomplished in an integrated fashion to conserve resources.

For Level 1, non-delegated Level 2, and special oversight acquisition programs, the Program Manager ensures a test plan is written prior to the start of the Developmental Test and a test report is written and distributed after test completion. Developmental testing to a specified standard should be conducted at an accredited or recognized test facility. While required for Level 1, non-delegated Level 2 and oversight programs, this is good management practice, and is expected for all other programs. To facilitate TSD in maintaining knowledge of Contractor Test and/or Developmental Test, all reports are provided to TSD.

For OT&E the DHS Operational Test Agent ensures a test plan is written and approved prior to the start of test. The Operational Test Agent ensures the testing is completed in an operationally realistic environment, at an operational tempo, with a realistic threat and representative trained operators. An Operational Test Readiness Review is required for all Level 1, non-delegated Level 2, and special oversight acquisition programs, projects, and is expected for all other projects. The Operational Test Readiness Review should be led by the Component Acquisition Executive or designee, and conducted in a manner that ensures everything is ready to start the Operational Test. Attendance at the Operational Test Readiness Review includes the Program Manager, Sponsor/User, TSD, DOT&E, Under Secretary for Management, and the Operational Test Agent. Specific areas for Operational Test Readiness Review include:

- a. All Operational Test Entrance Criteria specified in the Test and Evaluation Master Plan are satisfied;
- b. Satisfactory performance in Developmental Test;
- c. Operational Test Plan is approved;
- d. Adequate numbers of systems are available for testing;
- e. Representative users are identified for test conduct;
- f. A Concept of Operations is established;
- g. Required training is available and planned;
- h. All resources required to execute the Operational Test including instrumentation, spare parts, manuals, etc.; and
- i. There are no outstanding critical deficiencies related to safety, security, or the inability to perform key mission functions that do not have an identified workaround approved by the CAE.

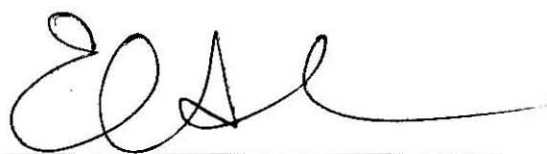
An OT&E Report is written by the Operational Test Agent and distributed within 90 days of test completion or 30 days before ADE 3, whichever is first. The report addresses all critical issues and provides an evaluation the operational suitability and operational effectiveness of the system. The Operational Test Agent may utilize all test data sources as well as modeling and simulation results in conducting the evaluation. DOT&E writes a Letter of Assessment that includes an assessment of the adequacy of the operational test, a concurrence or non-concurrence on the Operational Test Agent evaluation of operational suitability and operational effectiveness, and any further independent analysis. This Letter of Assessment is written within 30 days of receiving the OT&E Report and provided to the Chair of the Acquisition Review Board.

DHS DOT&E participates as a member of the Acquisition Review Board supporting the ADE 3. Approval by the ADA at ADE 3 authorizes commencement into the Produce, Deploy and Support Phase.

4. **Produce, Deploy and Support Phase.** During this phase of the Acquisition Lifecycle, systems and support equipment are produced for deployment into operational use. The goal during this phase is to achieve the full operational capability that satisfies the mission need. There is limited T&E activity during this phase, but for Level 1 and non-delegated Level 2 programs DHS S&T continues to monitor the program and approve any Operational Test Plans and review Operational Test and Evaluation Reports for a follow-on block of capability. If a discretionary ADE 3A is required for a follow-on block production authorization, TSD and DOT&E will participate.

VI. Questions

Address any questions or comments on this Directive to the DHS Science and Technology Directorate, Test and Evaluation and Standards Division.



Elaine C. Duke
Under Secretary for Management



Date