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Test and Evaluation

CAPABILITIES BASED TEST AND EVALUATION

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This Air Force Instruction (AFI) implements Air Force Policy Directive (AFPD) 99-1, *Test and Evaluation Process.* It describes the planning, conduct, and reporting of cost effective test and evaluation (T&E) programs as an efficient continuum of integrated testing known as seamless verification. This AFI implements the policies in Department of Defense Directive (DoDD) 5000.1, *The Defense Acquisition System*, and DoD Instruction (DoDI) 5000.2, *Operation of the Defense Acquisition System* (collectively called the DoD 5000-series); *National Security Space (NSS) Acquisition Policy 03-01*; Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01D, *Joint Capabilities Integration and Development System*, and CJCS Manual (CJCSM) 3170.01A, *Operation of the Joint Capabilities Integration and Development System.* This AFI **must** be used in conjunction with AFI 10-601, *Capabilities Based Requirements Development,* and AFI 63-101, *Operation of the Capabilities Based Acquisition System,* which replaces AFI 63-101, *Acquisition System*, in late 2004. For recommended non-mandatory guidance, use the *Defense Acquisition Guidebook (*formerly DoD 5000.2-R). Any organization conducting T&E may supplement this instruction as required. This instruction applies to all Air Force organizations conducting T&E activities, including the Air National Guard and Air Force Reserve Command. This instruction applies to all acquisition projects and programs regardless of acquisition category (ACAT). Headquarters (HQ) USAF/TE is the sole waiver authority for policies in this AFI. Send proposed supplements or changes to this instruction to HQ USAF/TEP, 1530 Air Force Pentagon, Washington DC, 20330-1530. Ensure all records created as a result of this AFI are maintained according to AFPD 37-1, *Information Management*, and Air Force Manual (AFMAN) 37-123, *Management of Records*, and disposed of according toAir Force *Records Disposition Schedule* located at **https://webrims.amc.af.mil**.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

This is the first publication of AFI 99-103. It rescinds three AFIs and consolidates them into one document: AFI 99-101, *Developmental Test and Evaluation*; AFI 99-102, *Operational Test and Evaluation*; and AFI 99-105, *Live Fire Test and Evaluation*. This document reflects major changes in the DoD

5000-series documents, CJCSI 3170.01D, CJCSM 3170.01A, and AFIs in the 10-series, 16-series, 33-series, and 63-series. New policies address the following: requirements for integrated test planning; early tester involvement; formation of integrated test teams (ITT); T&E for evolutionary acquisition (EA), spiral development, and incremental development; tester roles in the requirements development process; major command (MAJCOM) and field operating agency (FOA) tester roles and responsibilities. New T&E requirements are added for information technology (IT) and National Security Systems (NSS) as required by DoDI 8500.2, *Information Assurance (IA) Implementation,* and CJCSI 6212.01C, *Interoperability and Supportability of Information Technology and National Security Systems.* In addition, the purpose and scope of force development evaluation (FDE) and operational utility evaluation (OUE) are redefined; and space system T&E roles are defined.

Chapter 1

VISION AND IMPLEMENTATION CONCEPTS

1.1. Purpose of Test and Evaluation (T&E). The overarching functions of T&E are to mature system designs, manage risks, identify and help resolve deficiencies as early as possible, and ensure systems are operationally effective and suitable. The Air Force T&E community plans for and conducts integrated T&E as an efficient continuum known as seamless verification in collaboration with the requirements and acquisition communities. The T&E community will:

1.1.1. Collaborate with requirements sponsors and system developers in developing and fielding better systems faster and more cost effectively.

1.1.2. Provide timely, accurate, and affordable information to decision makers so they may decide whether a system or combat capability should be produced or deployed.

1.1.3. Help manage risks during engineering, acquisition, fielding, and sustainment by accurately characterizing system technical and operational performance throughout the system life cycle.

1.1.4. Help the acquisition and sustainment communities acquire and maintain operationally effective, suitable, and survivable systems for Air Force operators throughout the system life cycle.

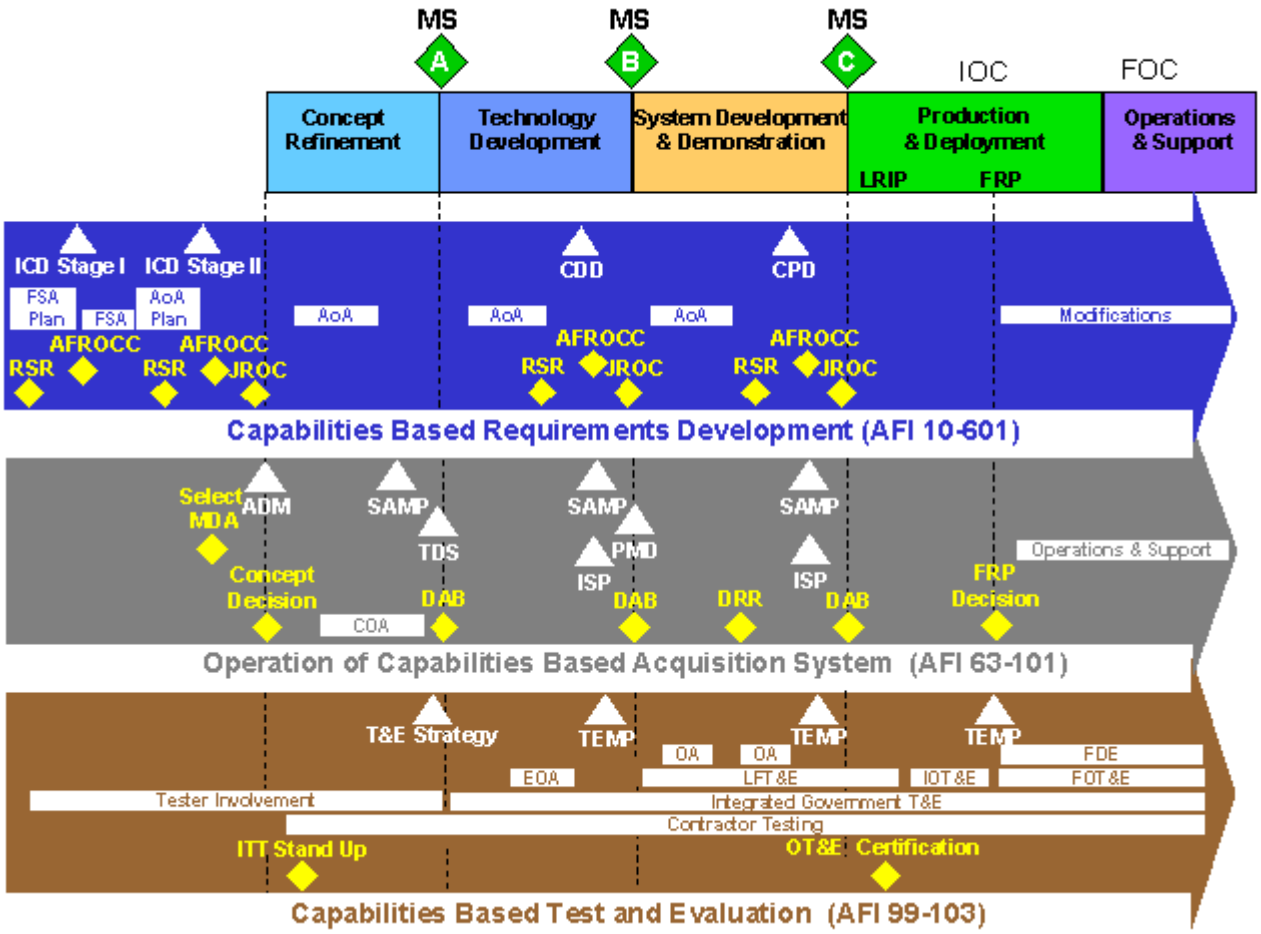
1.1.5. Give operators the information needed to assess mission impacts, develop doctrines, refine requirements, and refine tactics, techniques, and procedures (TTP).

1.2. New Acquisition Environment. Agile acquisition is the new overarching concept designed to bring new capabilities to operators more quickly. It begins with requirements generation and continues with acquisition, T&E, and rapid fielding of new systems. Agile acquisition institutes a capabilities-based orientation to the Air Force requirements, acquisition, and T&E processes.

1.2.1. **Evolutionary Acquisition (EA).** EA is the DoD's preferred acquisition **strategy** for delivering warfighting capabilities to operators. Spiral development and incremental development are the **processes** used to carry out the EA strategy. See **Attachment 1** for definitions of these processes.

1.2.2. **New Collaborative Concepts and Processes.** Agile acquisition is based on new concepts and processes described in AFI 10-601, *Capabilities Based Requirements Development*, AFI 63-101, *Operation of the Capabilities Based Acquisition System*, and this AFI. **Figure 1.1.** shows the acquisition process as the "master clock" for the integration of requirements, acquisition, and T&E events and activities. Variations of **Figure 1.1.** are used throughout this AFI to show T&E events during each phase of acquisition. ***NOTE***: AFI 63-101 will be reissued in Summer, 2004, under a new title.

Figure 1.1. Integration of the Requirements, Acquisition, and T&E Processes.



NOTE: **All acronyms in this figure are defined in Attachment 1.**

1.2.3. **National Security Space (NSS) System Acquisition Process.** The acquisition and decision making process described in *National Security Space (NSS) Acquisition Policy 03-01* is significantly different than the acquisition process in DoDI 5000.2 and AFI 63-101. *NSS Acquisition Policy 03-01* uses a streamlined acquisition framework that causes their key decision points (KDP) for NSS acquisition programs to be phased earlier than typical DoD 5000-series milestones and decision reviews. However, the basic T&E support provided to NSS systems is similar to non-space systems. Whenever NSS systems are tested, testers must refer to *NSS Acquisition Policy 03-01* for additional guidance.

1.3. Seamless Verification. The seamless verification concept helps testers structure T&E to more effectively support the requirements and acquisition processes. Seamless verification minimizes the seams between contractor, developmental, and operational testing by implementing integrated testing techniques and procedures. Key stakeholders from multiple disciplines must integrate their efforts, produce efficient schedules, eliminate "stovepipes," share all information in open T&E databases, identify problems early, engage contractors to fix deficiencies sooner, and ensure systems are ready to enter dedicated operational testing with a high probability of success. The seamless verification concept is **integrated testing** and does the following:

1.3.1. Provides a new T&E framework to support EA, spiral development, incremental development, and programs using a single stage of development.

1.3.2. Refocuses T&E of materiel solutions on capabilities-based requirements instead of the traditional pass-fail way of measuring against specification-like requirements. Capability based testing ensures T&E strategies and plans are derived from the operational environment and functionality specified in validated operational capabilities requirements. It requires understanding of how systems will be employed in operational environments, and involves developing T&E strategies and plans to determine whether a capability solution merits fielding.

1.3.3. Satisfies the requirement in Title 10 United States Code for initial operational test and evaluation (IOT&E).

1.3.4. Integrates the various types of T&E described in **Chapter 2** as seamlessly as possible through an integrated test team (ITT).

1.4. Integrated Test Team (ITT). An ITT will be formed during the Concept Refinement phase as shown in **Figure 1.1.** to create and manage the T&E strategy for the life of each program. Formal direction for establishing the ITT will be in the new program's first acquisition decision memorandum (ADM). The ITT construct is central to carrying out seamless verification and replaces the old test planning working group (TPWG). ITT membership will include representatives from the responsible test organization (RTO), operational test organizations, participating test organizations (PTO), system contractors, and the acquisition and requirements communities. The ITT is responsible to the PM and employs the general T&E principles in the following paragraphs. See paragraphs **3.14.** and **4.4.** for details about ITT responsibilities and functions.

1.5. General T&E Principles. The following T&E principles are based on the DoD 5000-series documents and lessons learned. A unifying theme is that all testers collaborate to the fullest extent possible to make systems better regardless of which organization is doing the testing. Integrated testing is the preferred way to organize all T&E activities, resources, and information within statutory and regulatory guidelines and sound engineering principles.

1.5.1. **Tailoring.** All T&E strategies and plans must be flexible to fit the needs of acquisition programs consistent with sound systems engineering practices, common sense, statutory and regulatory guidelines, and the time-sensitive nature of operators' requirements. All T&E strategies and plans must be tailored for each situation.

1.5.2. **Early Tester Involvement.** The early provision of T&E expertise and operational insight, preferably before the concept refinement phase, is key to getting new programs started in the right direction.

1.5.3. **Early Deficiency Resolution.** Deficiencies must be identified and resolved as early as possible so systems improve faster with the least cost.

1.5.4. **Event-Driven Schedules and Exit Criteria.** The ITT will plan sufficiently early for adequate time and resources for all T&E activities according to DoDD 5000.1. T&E activities must demonstrate that the system meets established engineering objectives, operational requirements, and exit criteria before moving to the next phase of development. The program manager (PM) must ensure the system is stable and mature before the system is certified ready for dedicated operational testing.

1.6. Applicability. The policies and processes in this AFI are for use by all Air Force acquisition programs and projects regardless of acquisition category (ACAT), to include non-ACAT programs. AFOTEC and each MAJCOM or field operating agencies (FOA) with designated test organizations will establish disciplined processes for planning and executing T&E activities to ensure the intent of this AFI is met. ***NOTE***: In this AFI, the term "MAJCOM" will include the FOAs. Minor modification programs (i.e., Air Force Form 1067 modifications) and MAJCOM-directed acquisition programs should comply with the following principles:

1.6.1. An appropriate level of operational testing supports acquisition and/or fielding decisions.

1.6.2. T&E strategies and plans are tailored for the program or project.

1.6.3. Early support is provided as required to ensure efficient planning and execution of integrated T&E.

1.6.4. Maximum sharing of T&E data.

1.7. Areas Not Covered by This AFI. The systems, programs, and activities listed below are not covered by this AFI. If there is a question of jurisdiction for space and space launch systems, consult HQ USAF/TEP, SAF/USA, and HQ AFMC/DOX or HQ AFSPC/DR for guidance.

1.7.1. Nuclear components governed by joint Department of Defense (DoD)-Department of Energy agreements.

1.7.2. Industrial maintenance inspections.

1.7.3. Activities associated with the space experimentation program described in AFI 10-1202, *Space Test Program (STP) Management.*

Chapter 2

TYPES OF TEST AND EVALUATION

2.1. Major Types of Testing. Air Force testing falls into two overarching categories, developmental testing and operational testing. These tests will be integrated to the maximum extent possible as described in **Chapter 4** through **Chapter 6**. Some requirements for T&E may not fall precisely into the following descriptions. Select and tailor the type of testing that best fits the need.

2.2. Developmental Testing. Developmental testing is conducted throughout the acquisition and sustainment processes to assist in engineering design and development, and to verify that critical technical parameters (CTP) have been achieved. Developmental test and evaluation (DT&E) supports the acquisition of new materiel or operational capabilities before full-rate production (FRP) or fielding decisions. After FRP or fielding, DT&E supports the sustainment of systems to keep them current or extend their useful life, performance envelopes, and capabilities. As many test activities as practical are conducted in operationally relevant environments without compromising engineering integrity, safety, or security. Developmental testing supports the decision to certify systems ready for dedicated operational testing according to AFMAN 63-119, *Certification of System Readiness for Dedicated Operational Test and Evaluation*. In addition, developmental testing:

2.2.1. Assesses the technological capabilities of systems or concepts in support of requirements activities described in AFI 10-601 (e.g., Analysis of Materiel Approaches, Courses of Action (COA)). Conducts research to investigate new concepts and technologies and collect basic scientific and engineering data.

2.2.2. Provides empirical data for cost-schedule-performance trade-offs.

2.2.3. Evaluates and uses modeling and simulation (M&S) tools and digital system models (DSM), and performs verification and validation with actual test data.

2.2.4. Identifies and helps resolve deficiencies as early as possible.

2.2.5. Verifies the extent to which design risks have been minimized.

2.2.6. Verifies compliance with specifications, standards, and contracts.

2.2.7. Characterizes system performance, military utility, and determines system safety.

2.2.8. Quantifies contract technical performance and manufacturing quality.

2.2.9. Ensures fielded systems continue to perform as required in the face of changing operational requirements and threats.

2.2.10. Ensures modifications and upgrades address operational safety, suitability, and effectiveness according to AFI 63-1201, *Assurance of Operational Safety, Suitability, and Effectiveness*.

2.2.11. Supports aging and surveillance programs, value engineering projects, productivity, reliability, availability and maintainability projects, technology insertions, and other modifications according to AFI 63-1101, *Modification Management*.

2.3. Specialized Types of Developmental Testing.

2.3.1. **Qualification Test and Evaluation (QT&E).** QT&E is a tailored type of DT&E conducted on commercial-off-the-shelf (COTS), non-developmental items (NDI), and government furnished equipment (GFE). Depending on operator requirements, these items may require little or no government funded research and development (R&D), engineering, design, or integration efforts. PMs cannot disregard T&E of COTS, NDI, and GFE simply because these items came from pre-established sources and some pre-existing data may be available. See paragraph **5.15.** for more information on COTS, NDI, and GFE.

2.3.2. **Production-Related Testing.** The PM will ensure T&E is conducted on production items to demonstrate that specifications and performance-based requirements of the procuring contracts have been fulfilled. Defense Contract Management Agency personnel normally oversee this testing at the contractor's facility. The typical tests (defined in **Attachment 1**) are: first article test (FAT); lot acceptance test (LAT); pre-production qualification test (PPQT); production qualification test (PQT); and production acceptance test and evaluation (PAT&E).

2.4. Live Fire Test and Evaluation (LFT&E). LFT&E is a type of DT&E that provides timely, rigorous, and credible vulnerability or lethality tests and evaluations of "covered" systems as they progress through the System Development and Demonstration (SDD) phase prior to FRP or major system modification that affects survivability. Survivability consists of susceptibility, vulnerability, and recoverability information derived from the firing of actual weapons (or surrogates if actual threat weapons are not available) at components, sub-systems, sub-assemblies, and/or full up, system-level targets. Modeling, simulation, and analysis must be an integral part of the LFT&E process. The Air Force must initiate LFT&E programs sufficiently early to allow test results to impact system design prior to FRP or major modification decisions. ***NOTE:*** See paragraph **5.10.** for more information; **Attachment 1** for key definitions; and Title 10 §2366. The Air Force accomplishes LFT&E to:

2.4.1. Provide information to decision makers on potential operator casualties, system vulnerabilities, lethality, and system recoverability, taking into equal consideration the susceptibility to attack and combat performance of the system.

2.4.2. Ensure system fielding decisions are based on evaluation of vulnerability and lethality data generated via testing the system under conditions that are as realistic as possible and based on validated modeling and simulation.

2.4.3. Assess battle damage repair capabilities and issues. ***NOTE:*** While assessment of battle damage repair is not a statutory requirement of LFT&E, test officials should exploit opportunities to assess such capabilities whenever prudent and affordable.

2.5. Operational Testing. Operational testing determines if operational requirements have been satisfied, and assesses system impacts to peacetime and combat operations. It identifies and helps resolve deficiencies as early as possible, identifies enhancements, and looks at changes in system configuration that alter system performance. Operational testing includes a determination of the operational impacts of fielding and/or employing a system across the full spectrum of military operations. Operational testing may also look at doctrine, operational concepts, system performance, procedures, tactics, training, organization, personnel, logistics support elements, intelligence support elements, system interoperability, and materiel issues.

2.6. Types of Operational Testing. The types of operational testing listed below afford operational testers a range of options for efficiently answering decision makers' questions. "Evaluations" collect, analyze, and report data against stated criteria with a high degree of engineering rigor, and are used to support FRP or fielding decisions. "Assessments" collect and analyze data with less engineering rigor, need not report against stated criteria, and cannot be the sole source of T&E data for FRP or fielding decisions. All programs that result in a FRP or fielding decision require some type of operational testing supported by sufficient independent evaluation to support the decision. Operational testing must be based on an approved requirements document specifically for the capabilities being fielded. Operational testers will assess programs for the type of operational testing based on programmatic risk and the type of decision supported.

2.6.1. **Initial Operational Test and Evaluation (IOT&E).** IOT&E determines the operational effectiveness and suitability of systems using production or production-representative articles with stabilized performance and operationally representative personnel. Tests are conducted under operational conditions and mission scenarios, including combat, that are as operationally realistic as possible and practical. IOT&E determines if operational requirements and critical operational issues (COI) have been satisfied and assesses system impacts to peacetime and combat operations. A dedicated phase of IOT&E is required for ACAT I and II programs according to Title 10 §2399 and is strongly encouraged for all other programs. IOT&E is conducted by the Air Force Operational Test and Evaluation Center (AFOTEC).

2.6.2. **Qualification Operational Test and Evaluation (QOT&E).** QOT&E is a tailored type of IOT&E used when little or no government-funded R&D takes place on the system. It is used to evaluate the military-unique portions and applications of COTS, NDI, and GFE for military use in an operational environment. PMs cannot disregard T&E of COTS, NDI, and GFE simply because these items came from pre-established sources. QOT&E supports the same kinds of decisions as IOT&E. See paragraph **5.15.** for more information on COTS and NDI. QOT&E is conducted by AFOTEC.

2.6.3. **Follow-on Operational Test and Evaluation (FOT&E).** FOT&E is the continuation of operational test and evaluation (OT&E) past the FRP or initial fielding decision to ensure the system acquisition process is complete. It answers specific questions about unresolved COIs and test issues, verifies correction of deficiencies, or completes areas not finished during the IOT&E or QOT&E as identified in an ADM or other direction. Additional FOT&Es may be required after IOT&E of later increments depending on the acquisition strategy. FOT&E is conducted by AFOTEC.

2.6.4. **Multi-Service Operational Test and Evaluation (MOT&E).** MOT&E is the name for IOT&E, QOT&E, or FOT&E when two or more military Services are involved. See the *Memorandum of Agreement [MOA] on Multi-Service Operational Test and Evaluation (MOT&E),* and paragraphs **4.7.** and **7.9.**. If MAJCOMs conduct multi-Service testing without AFOTEC, they should use this MOA as a guide.

2.6.5. **Force Development Evaluation (FDE).** FDE is the operational testing of fielded, operational systems during the sustainment portion of the system life cycle. The focus is on maintaining or upgrading operational systems after the initial acquisition process is complete. An FDE also supports acquisition of MAJCOM-managed systems. In addition, FDE:

2.6.5.1. Evaluates software modifications (e.g., operational flight programs), follow-on increments, upgrades, mission data updates, and other improvements or changes made to sustain or enhance the system.

2.6.5.2. Evaluates and verifies correction of previously identified deficiencies from operational testing and new deficiencies discovered after fielding.

2.6.5.3. Evaluates operational systems against foreign equipment and new or modified threat systems.

2.6.6. **Tactics Development and Evaluation (TD&E).** TD&E is a tailored type of FDE specifically designed to further exploit doctrine, system capabilities, tactics, techniques, and procedures throughout the system life cycle according to AFI 11-260, *Tactics Development Program*. TD&Es normally identify non-materiel solutions to problems or evaluate better ways to use new or existing systems.

2.6.7. **Weapons System Evaluation Program (WSEP).** WSEP is a tailored type of FDE designed to provide end-to-end evaluation of fielded weapon systems and their support systems using realistic combat scenarios. In addition, WSEP conducts investigative firings to revalidate capability or better understand munitions malfunctions.

2.6.8. **Operational Utility Evaluation (OUE).** OUEs are evaluations conducted to demonstrate or validate new operational concepts or capabilities, upgrade components, or expand the mission or capabilities of existing or modified systems. OUEs will **not** be used when IOT&E, QOT&E, or FDE are required or are more suitable.

2.6.9. **Operational Assessment (OA).** OAs are conducted in preparation for dedicated operational testing as described in the DoD 5000-series and typically support Milestone (MS) C or low-rate initial production (LRIP) decisions. They are progress reports and are not capable of rating a system effective or suitable. They provide early operational data and feedback derived from actual testing to developers, operators, and decision makers. OAs will **not** be used as substitutes for IOT&E or QOT&E. OAs are integrated with DT&E to assess and report on the following:

2.6.9.1. A system's maturity and potential to meet operational requirements during dedicated operational testing, and to augment and possibly reduce the scope of dedicated operational testing.

2.6.9.2. Support for long-lead, LRIP, or spirals of spiral development and incremental development programs.

2.6.9.3. Identification of deficiencies or design problems impacting system capability to meet operational requirements, the mission, and employment concepts.

2.6.9.4. Potential system changes needed to update operational requirements, COIs, and the acquisition strategy.

2.6.9.5. Support the demonstration of new technologies or new applications of existing technologies. Demonstrate how well prototype systems meet mission needs or satisfy operational requirements.

2.6.9.6. Support proof of concept initiatives from USAF Battlelabs.

2.6.10. **Early Operational Assessment (EOA).** EOAs are similar to OAs, except they are performed prior to MS B to provide very early assessments of system capabilities and programmatic risks.

2.6.11. **Summary of Operational Testing.** The key distinctions between types of operational testing and the decisions that are supported are shown in **Table 2.1.**. MAJCOMs will conduct OUEs or FDEs for programs requiring FRP or fielding decisions if AFOTEC elects not to conduct IOT&E, QOT&E, or FOT&E. The results of TD&Es are considered "fielded" when new TTPs are published.

Table 2.1. Options for Operational Testing.

Type of Operational Testing	ASSESSMENTS	EVALUATIONS		
	EOA, OA	IOT&E, QOT&E, FOT&E	OUE	FDE, TD&E, WSEP
Who Conducts	All	AFOTEC	All	MAJCOM
Type Program	All	ACAT I, II, III, OSD T&E Oversight	ACAT III, AF Fm 1067 mods	ACAT III, AF Form 1067 mods
Decision Supported	EOA: MS B OA: MS C, LRIP	FRP, Fielding	FRP, Fielding	FRP, Fielding

2.7. Test Support for Technology Transition. DoDI 5000.2 creates multiple paths for "technology projects" and experimentation projects to enter the new agile acquisition system in support of employment concepts. Since these technology projects fall outside the traditional acquisition process, Air Force testers may be required to support the following activities by providing T&E expertise to ensure the intent of the acquisition process is followed.

2.7.1. **Advanced Technology Demonstrations (ATD).** These are fully funded advanced development efforts used to meet the needs of employment concepts and capability requirements through "proof of principle" demonstrations in operationally realistic environments. ATDs demonstrate the maturity and potential of advanced technologies for enhancing military operational capabilities. See AFI 61-105, *Planning for Science and Technology*.

2.7.2. **Battlelab Initiatives (BI).** BIs identify and demonstrate the military utility of innovative ideas that improve core capability execution and joint warfighting. They are conducted under the direction of the sponsoring battlelab(s). Battlelabs will draw upon the expertise and resources of recognized T&E organizations for demonstration planning and execution before starting demonstration activities. BI demonstrations will not certify equipment, procedures, etc., for operational use, or replace formal T&E in acquisition or other processes. Testers will assist BI sponsors as mutually agreed. See AFI 10-2303, *Battlelabs*, and paragraph **5.9.2.** for limitations on using operational units.

2.7.3. **Advanced Concept Technology Demonstrations (ACTD).** ACTDs are Office of the Secretary of Defense (OSD)-sponsored projects designed to exploit maturing technologies that have potential to fulfill urgent military requirements and rapidly transfer those technologies to operators. ACTDs are not a formal part of the acquisition process, but highly tailored "demonstrations" under the direction of an ACTD operator-sponsor. The Deputy Under Secretary of Defense for Advanced Systems and Concepts, DUSD(AS&C), has guidance at **http://www.acq.osd.mil/actd/guidelns.htm**.

2.8. Foreign Comparative Testing (FCT). FCT is a OSD-sponsored T&E program prescribed by Title 10 §2350a(g) and centrally managed by the Office of the Under Secretary of Defense, Acquisition, Technology and Logistics, Director of Defensive Systems (USD(AT&L)/DS). FCT is conducted on foreign nations' systems, equipment, and technologies to determine their potential to satisfy validated United States (U.S.) operational requirements. Testers participate in FCT projects as directed in the program management directive (PMD). See The *Foreign Comparative Testing (FCT) Handbook* at **http://www.acq.osd.mil/cto/**, and the *International Armament Cooperation Handbook*.

2.9. Joint Test and Evaluation (JT&E). The JT&E Program charters joint test projects to evaluate military capabilities and potential options for increasing joint military effectiveness. The JT&E Program focuses on evaluating current equipment, organizations, threats, doctrine, TTPs, test methodologies, and system interoperability in realistic environments. The JT&E Program and organizational responsibilities are described in AFI 99-106, *Joint Test and Evaluation Program*, and DoDD 5010.41, *Joint Test and Evaluation (JT&E) Program*. ***NOTE:*** The JT&E projects are **not** acquisition programs, but totally distinct and separate from MOT&E and multi-Service testing. See definitions in **Attachment 1**.

Chapter 3

RESPONSIBILITIES

3.1. Overview of Responsibilities. All Air Force testers and the acquisition community will follow the T&E principles articulated in **Chapter 1** of this AFI using the types of tests described in **Chapter 2**. All testers must collaborate with other testers, acquisition officials, and requirements sponsors using the ITT as the T&E focal point for each program. The acquisition community must use this AFI to ensure the agile acquisition and seamless verification concepts function as intended.

3.2. Director, Operational Test and Evaluation (DOT&E). DOT&E:

3.2.1. Prescribes OT&E and LFT&E policies for the DoD according to Title 10 §139, §2366, §2399, and §2400; and DoDD 5141.2, *Director of Operational Test and Evaluation (DOT&E)*.

3.2.2. Exercises oversight responsibility for ACAT I or other programs in which the Secretary of Defense (SECDEF) has special interest. Monitors and reviews OT&E and LFT&E activities in the DoD. Participates in ITTs and test integrated product teams (TIPT) to foster program success.

3.2.3. Publishes, in conjunction with USD(AT&L)/DS, a combined list of OSD T&E Oversight programs for DT&E, LFT&E, and OT&E.

3.2.4. Approves in writing the adequacy of operational test plans for those programs on OSD OT&E Oversight prior to commencement of operational testing activities. Approves the operational test portions of integrated test plans. Approves the quantity of test articles required for operational testing of major defense acquisition programs (MDAP).

3.2.5. Approves test and evaluation master plans (TEMP) and T&E strategies for OSD T&E Oversight programs in conjunction with USD(AT&L)/DS and Assistant Secretary of Defense for Networks and Information Integration (ASD/NII).

3.2.6. Approves LFT&E strategies prior to commencement of LFT&E activities, and approves LFT&E waivers.

3.2.7. Submits a report to SECDEF and Congress before systems on OSD T&E Oversight may proceed beyond LRIP.

3.3. Headquarters, U.S. Air Force, Directorate of Test and Evaluation (HQ USAF/TE). HQ USAF/TE will:

3.3.1. Function as the chief T&E advisor to Air Force senior leadership. Is responsible to the Chief of Staff of the Air Force (CSAF) for establishing Air Force T&E policy, determining the adequacy of T&E resources required to support weapons system development, and resolving T&E issues.

3.3.2. Act as the final T&E review authority and signatory for TEMPs prior to Component Acquisition Executive (CAE) approval and signature.

3.3.3. Collaborate with requirements sponsors and system developers in developing, testing, and fielding better systems sooner and more cost effectively. Participate in high performance teams (HPT), ITTs, and TIPTs as necessary to help ensure program success.

3.3.4. Respond to and mediate T&E issues between HQ USAF principals, MAJCOMs, Air Force testers, the Services, OSD, and Congress.

3.3.5. Review and/or prepare T&E information for release to OSD, and assure timely availability of T&E results to decision makers.

3.3.6. Oversee the Air Force T&E infrastructure by ensuring adequate resources to support system acquisition activities. Administer various T&E resource processes and chair or serve on various committees, boards, and groups listed in Air Force Pamphlet (AFPAM) 38-102, *Headquarters United States Air Force Organization and Functions (Chartbook)*, Chapter 31.

3.3.7. Co-chair the Air Staff Foreign Materiel Program Committee which provides Foreign Materiel Program management oversight. Publish AFI 99-114, *Foreign Materiel Program (S)*.

3.3.8. Function as the certifying authority for T&E personnel for T&E Level 3 in the Acquisition Professional Development Program (APDP) when not delegated to the MAJCOMs.

3.3.9. Provide advice on ITT charter development and membership requirements. Review ITT charters for programs on OSD T&E Oversight.

3.3.10. Perform other duties listed in Air Force Pamphlet (AFPAM) 38-102, Chapter 31.

3.4. Assistant Secretary of the Air Force for Acquisition (SAF/AQ). SAF/AQ or designated representatives will:

3.4.1. Assist ITTs and TIPTs in developing T&E strategies as early as possible (i.e., before MS A) for non-space systems.

3.4.2. Ensure Program Executive Officers (PEO), Capability Directors, and PMs certify systems ready for dedicated operational testing according to AFMAN 63-119.

3.4.3. Ensure T&E responsibilities are documented in the ADM, PMD, TEMP or single acquisition management plan (SAMP), integrated program summary (IPS), and other program documentation. Ensure the initial ADM gives direction for establishing the ITT.

3.4.4. Regarding LFT&E, SAF/AQ will:

3.4.4.1. Recommend candidate systems to DOT&E for compliance with LFT&E legislation after coordinating the proposed nominations with HQ USAF/TE.

3.4.4.2. Approve agreed-upon LFT&E programs and allocate Air Force resources required to accomplish LFT&E plans. Approve and forward required LFT&E documentation to DOT&E. Forward LFT&E waivers (and legislative relief requests, if appropriate) to DOT&E if required.

3.4.5. Approve TEMPs for all non-space ACAT I, IA, II, and other programs on OSD T&E Oversight. Forward these approved TEMPs to DOT&E and USD(AT&L)/DS.

3.5. Under Secretary of the Air Force (SAF/US). SAF/US will:

3.5.1. Function as DoD's Space Milestone Decision Authority (MDA) and Air Force CAE for assigned space and missile acquisition programs according to *NSS Acquisition Policy 03-01*. ***NOTE***: The acquisition process in *NSS Acquisition Policy 03-01* is significantly different than the acquisition process in DoDI 5000.2 and AFI 63-101. See paragraph **1.2.3.**.

3.5.2. Assist ITTs and TIPTs as early as possible (i.e., before Key Decision Point A).

3.5.3. Ensure PEOs, Capability Directors, and PMs certify systems ready for dedicated operational testing according to AFMAN 63-119.

3.5.4. Ensure space system T&E responsibilities are documented in the ADM, PMD, TEMP, SAMP, or IPS, and other program documentation. Ensure each program has established an ITT prior to KDP-A.

3.5.5. Ensure approval of TEMPs for all space ACAT I, II, and other programs on OSD T&E Oversight. Forward approved TEMPs to DOT&E and USD(AT&L)/DS.

3.6. Headquarters, Air Force Materiel Command (AFMC). HQ AFMC will:

3.6.1. Develop AFMC DT&E policies, procedures, guidance, and MOAs for non-space programs in assigned mission areas to supplement this AFI. Forward draft copies for HQ USAF/TEP review prior to publication.

3.6.2. Establish and provide for DT&E training, organization, and T&E infrastructure resources.

3.6.3. Ensure T&E representation to pre-Concept Refinement phase activities to assist in early requirements development, early T&E strategy development, and early acquisition planning according to AFI 10-601, AFI 63-101, and this AFI. Identify organizations responsible for these activities.

3.6.4. Assist the ITT and PM in identifying government DT&E organizations as RTO candidates as soon as possible after the Concept Decision according to paragraphs **4.4.** and **4.5.**.

3.6.5. Establish policy for establishing and assigning T&E focal points at the air logistics centers (ALC) and product centers.

3.6.6. Maintain the 99-series AFMANs for assigned Air Force mission areas.

3.6.6.1. Ensure the 46 Test Wing (TW) maintains AFMAN 99-104, *Armament-Munitions Test Process—Direction and Methodology for Testing*, and AFMAN 99-111, *Command, Control, Communications, Computers, and Intelligence (C4I) Test and Evaluation Process.*

3.6.6.2. Ensure the Flight Test Center (AFFTC) maintains AFMAN 99-110, *Air Frame-Propulsion-Avionics Test and Evaluation Process Manual,* and AFMAN 99-112, *Electronic Warfare Test and Evaluation Process—Direction and Methodology for EW Testing.*

3.6.7. Ensure test centers conduct long-range planning to ensure T&E infrastructure and processes are in place to support required testing.

3.6.8. Ensure test centers participate in T&E resource investment planning processes according to AFI 99-109, *Test Resource Planning*.

3.6.9. Ensure ALC and product center PMs oversee the conduct of DT&E and support operational testing of fielded systems throughout the life cycle of the system.

3.6.10. Oversee and inspect AFMC compliance with this instruction.

3.7. Headquarters, Air Force Space Command (AFSPC). HQ AFSPC will:

3.7.1. Develop HQ AFSPC T&E policies, procedures, guidance, and MOAs for space and missile programs to supplement this AFI. Forward draft copies for HQ USAF/TEP review prior to publication.

3.7.2. Serve as the focal point for T&E of space launch and missile acquisition programs, and technology projects in conjunction with SAF/US.

3.7.3. Ensure T&E representation to pre-Concept Decision activities to assist in early requirements development, early T&E strategy development, and early acquisition planning.

3.7.4. Assist the ITT and PM in identifying government DT&E organizations as RTO candidates as soon as possible after the Concept Decision according to paragraphs **4.4.** and **4.5.**. Participate in ITTs and TIPTs as necessary to help ensure program success.

3.7.5. Advocate for and procure space- and missile-related T&E infrastructure, resources, and requirements.

3.7.6. Review and coordinate on space- and space launch-related test plans, test reports, and test-related correspondence for programs on OSD T&E Oversight.

3.7.7. Maintain DT&E and operational testing expertise.

3.7.8. Implement the policies in *NSS Acquisition Policy 03-01* and DoDI S-3100.15, *Space Control*, for space control systems.

3.7.9. Ensure T&E training is provided for AFSPC personnel involved in T&E.

3.7.10. Maintain AFMAN 99-113*, Space Systems Test and Evaluation Process Direction and Methodology for Space System Testing.*

3.8. Program Managers (PM). PMs will:

3.8.1. Form and co-chair (with AFOTEC or other operational testers) ITTs as early as possible (preferably before Concept Refinement) according to paragraphs **1.4.** and **4.4.**. ***NOTE:*** See definition of PM in **Attachment 1**.

3.8.2. Assist the ITT in structuring all testing into a T&E strategy and integrated test plan (ITP) in support of the requirements and acquisition strategies.

3.8.3. Lead the development of the ITT charter and coordinate with stakeholder organizations.

3.8.4. Secure specialized T&E capabilities and instrumentation sufficiently early in support of the T&E strategy and test plans.

3.8.5. Regarding LFT&E, the PM will:

3.8.5.1. Ensure systems are screened and correctly designated as “covered systems” or “covered product improvement programs” if required by Title 10 §2366. Coordinate the proposed nomination with SAF/AQ, HQ USAF/TEP, and the PEO or Capability Director before forwarding to DOT&E.

3.8.5.2. Plan, program, and budget for LFT&E resources if the system is “covered,” to include test articles, facilities, manpower, instrumented threats, and realistic targets.

3.8.5.3. Identify critical LFT&E issues. Prepare and coordinate required LFT&E documentation to include the TEMP and LFT&E strategy, plans, and reports. Review briefings pertaining to the system under test before forwarding to HQ USAF and OSD.

3.8.5.4. Prepare LFT&E waiver requests and legislative relief requests if required, to include an alternative plan for evaluating system vulnerability or lethality.

3.8.6. Plan for and document the M&S approach and keep the Modeling and Simulation Support Plan current according to AFI 16-1002, *Modeling and Simulation in Support to Acquisition*.

3.8.7. Implement an effective system certification process as early as practical. Certify systems ready for dedicated operational testing according to AFMAN 63-119.

3.8.8. Determine the scope of DT&E needed throughout the project or program life cycle according to **Chapter 4** and **Chapter 5**. Ensure an RTO is designated not later than MS A according to paragraphs **4.4.** and **4.5.**.

3.8.9. Assist operational testers in determining the scope of operational testing.

3.8.10. Ensure all DT&E (both contractor and government) is conducted according to test plans.

3.8.11. Ensure operational testing is conducted for all acquisition or sustainment programs requiring an FRP or fielding decision. Consult with AFOTEC/XO before deciding to use a MAJCOM operational test organization in lieu of AFOTEC.

3.8.12. Plan for test and evaluation of system logistics support elements.

3.8.13. Ensure formation of TIPTs such as the Material Improvement Program Review Board and the Joint Reliability and Maintainability Evaluation Team (JRMET) to track and resolve deficiencies. See paragraphs **6.9.** and **6.10.**

3.8.14. Ensure the Air Force SEEK EAGLE Office certifies all internal or external stores according to AFI 63-104, *The SEEK EAGLE Program*.

3.8.15. Fund and support the T&E strategy and TEMP according to AFI 65-601, *Budget Guidance and Procedures*, Vol 1, Chapter 14.

3.8.16. Identify, report, validate, track, evaluate, and take appropriate actions on deficiency reports (DR) according to Chapter 2 of Technical Order (TO) 00-35D-54, *USAF Deficiency Reporting and Investigation System*, and AFI 63-501, *Air Force Acquisition Quality Program*. Continue supporting DR evaluation and resolution during operational testing and system sustainment.

3.8.17. Ensure timely government access to contractor T&E data, deficiency reporting processes, and all T&E results through an open T&E database available to all program stakeholders.

3.9. Air Force Operational Test and Evaluation Center (AFOTEC). AFOTEC will:

3.9.1. Develop AFOTEC OT&E policies, procedures, guidance, and MOAs to supplement this AFI. Forward draft copies for HQ USAF/TEP review prior to publication.

3.9.2. Carry out the responsibilities in Air Force Mission Directive (AFMD) 14, *Air Force Operational Test and Evaluation Center (AFOTEC).*

3.9.3. Help form and co-chair (with the PM) ITTs as early as possible, preferably before Concept Refinement, according to paragraph **4.4.**.

3.9.4. Assist the requirements and acquisition communities in developing testable capabilities-based requirements, technology development strategies (TDS), COAs, and analyses of alternatives (AoA).

3.9.5. Help prepare T&E strategies and integrated test plans. Prepare the OT&E portions of the TEMP or SAMP.

3.9.6. Function as the Air Force operational test agency (OTA). Monitor all Air Force acquisition programs for operational test applicability. Function as the lead OTA for multi-Service programs when designated.

3.9.7. Determine AFOTEC involvement (and level of involvement) as early as possible for technology projects and acquisition programs.

3.9.8. Plan and conduct OT&E for all programs on OSD OT&E Oversight that require an FRP or fielding decision. Use capabilities based requirements as the **primary** source of evaluation criteria. Report results directly to the CSAF and MDA.

3.9.9. Program for AFOTEC-conducted T&E activities and list costs, schedules, and resources in test resource plans (TRP). Coordinate TRPs with supporting organizations in sufficient time for funds and personnel to be budgeted during the program objective memorandum (POM) cycle.

3.9.10. Determine the quantity of test articles required for OT&E in consultation with the MAJCOM and the system program office (SPO).

3.9.11. Participate in the certification of readiness for dedicated OT&E according to AFMAN 63-119.

3.9.12. Identify, validate, submit, track, and prioritize system deficiencies and enhancements according to TO 00-35D-54.

3.9.13. Manage the Air Force JT&E Program according to DoDD 5010.41 and AFI 99-106.

3.9.14. Provide training for personnel involved in OT&E activities.

3.10. Operational MAJCOM and FOA Headquarters. MAJCOMs and FOAs will:

3.10.1. Develop MAJCOM T&E policies, procedures, guidance, and MOAs to supplement this AFI. Forward draft copies for HQ USAF/TEP review prior to publication. ***NOTE***: In this AFI, the term "MAJCOM" includes FOAs.

3.10.2. Participate early in ITTs in developing capabilities based requirements and integrated test plans in support of acquisition and sustainment programs. Consult with AFOTEC before planning to conduct operational testing that supports FRP and fielding decisions.

3.10.3. Review and coordinate on T&E-related documentation impacting MAJCOM systems.

3.10.4. Oversee the T&E policies and activities of assigned T&E organizations to ensure compliance with HQ USAF, OSD, and MAJCOM T&E policies.

3.10.5. Advocate for test resources and test requirements.

3.10.6. Ensure T&E training is provided for personnel involved in T&E activities.

3.10.7. Provide support for the OSD-sponsored JT&E Program and JTs according to AFI 99-106.

3.10.8. Ensure OAs, OUEs, and FDEs are planned, conducted, and results are reported.

3.10.9. Support AFOTEC-conducted OT&E with command resources as agreed by the ITT, TIPTs, and documented in TRPs and TEMPs. Support DT&E as agreed.

3.10.10. Assist in certifying systems ready for dedicated operational testing according to AFMAN 63-119.

3.10.11. Continue identifying and reporting DRs during OUEs and FDEs according to TO 00-35D-54, Chapter 2. Continue managing open DRs from earlier testing.

3.11. Headquarters, U.S. Air Force, Deputy Chief of Staff, Air & Space Operations (AF/XO). HQ USAF/XO will support ITTs and participate in T&E strategy development.

3.12. Air Force Command and Control & Intelligence, Surveillance, and Reconnaissance Center (AFC2ISRC). The AFC2ISRC will:

3.12.1. Participate in ITTs and TIPTs for systems with command and control (C2) and intelligence, surveillance, and reconnaissance (ISR) capabilities.

3.12.2. Coordinate with the OTA, RTO and/or owning MAJCOMs when reviewing the C2 and ISR-related portions of T&E plans.

3.12.3. Manage the interoperability certification testing program for all Air Force C2 and ISR systems according to CJCSI 6212.01C*, Interoperability and Supportability of Information Technology and National Security Systems*.

3.12.4. Act as the primary C2 and ISR Air Force interface to the Joint Interoperability Test Command (JITC) for interoperability certification test policies and interoperability testing.

3.12.5. Provide for and fund the facilities and resources to perform Air Force C2 weapon systems transformation according to HQ AF/XI program guidance, and in coordination with Air Combat Command and Electronic Systems Command.

3.12.6. Ensure C2 and ISR systems undergo sufficient interoperability compatibility, security, integration verification, and system-of-systems validation testing to support valid Air Force and Joint decision reviews and fielding decisions. Conduct interoperability certification testing as directed by JITC.

3.12.7. The AFC2ISRC/CC will provide an Air Force C2ISR Transformation Center (AFC2TC) to integrate T&E efforts of supporting contractor and government test organizations to create seamless and accelerated T&E programs to support fielding of C2 and ISR capabilities. The AFC2TC test team will serve as a user test organization for AFC2ISRC-sponsored products and lab initiatives ready for transition into operational environments when so designated by the AFC2ISRC.

3.12.8. Coordinate experimentation functions described in paragraph **2.7.** and other transformational C2 and ISR T&E activities.

3.13. Air Force Information Warfare Center (AFIWC). AFIWC will:

3.13.1. Participate in ITTs and TIPTs as soon as they are formed, as required.

3.13.2. Serve as the Air Force focal point for T&E of information operations (IO) technologies involving development, enhancements, upgrades, operations, security, training, intelligence, and TTPs of offensive and defensive counter-information operations.

3.13.3. Plan and conduct operations security, information assurance (IA), and system vulnerability assessments as described in program documentation and integrated test plans.

3.13.4. Advocate for IO-related T&E resources and requirements.

3.14. Integrated Test Team (ITT). The ITT will:

3.14.1. Develop and manage the T&E strategy and integrated test plans (ITP) to effectively support the requirements, acquisition, and sustainment strategies. ***NOTE:*** A single ITT may cover multiple related programs.

3.14.2. Develop and implement an ITT charter according to paragraph **4.4.** Coordinate updates to the charter as program changes warrant.

3.14.3. Direct formation of TIPTs to address T&E data analysis, problem solving, test planning, test execution, and reporting.

3.14.4. Assist in establishing test teams (e.g., combined test forces [CTFs]) to conduct integrated T&E, and decide who will be responsible for specific tests.

3.14.5. Assist the acquisition community in developing studies, analyses, documentation, strategies, and plans according to AFI 63-101.

3.14.6. Develop the TEMP or SAMP T&E annex and other T&E documentation according to the DoD 5000-series and this AFI.

3.14.7. Assist the requirements community in developing the Requirements Strategy, Analyses of Materiel Approaches, AoA plans and AoAs, requirements documents, and architectures as described in AFI 10-601, CJCSI 3170.01D, CJSCM 3170.01A, and CJCSI 6121.01C.

3.14.8. Ensure security test and evaluation of information technologies is planned according to DoDI 5200.40, DoD Information Technology Security Certification and Accreditation Process (DITSCAP).

3.14.9. Ensure all T&E activities comply with arms control treaty limitations and obligations. Check with SAF/GCI and HQ USAF/XONP for guidance.

3.14.10. Plan for a common T&E database according to paragraph **6.9.**

3.14.11. Nominate an RTO to the PEO for approval according to paragraph **4.5.**

3.14.12. Ensure integrated technical and safety reviews are conducted according to paragraph **6.5.**

3.14.13. Ensure test teams report, validate, and prioritize DRs according to TO 00-35D-54, Chapter 2, AFI 63-501, and AFI 10-602, *Determining Mission Capability and Supportability Requirements*.

3.14.14. Review and provide inputs to contractual documents to ensure they address government testing needs according to paragraph **5.4.** Oversee contractor and PTO T&E activities.

3.14.15. Identify T&E resource requirements, including necessary facility upgrades and personnel.

3.15. Responsible Test Organization (RTO). The RTO will:

3.15.1. Participate in ITTs as early as possible and assist TIPTs as required.

3.15.2. Assist the requirements and acquisition communities in developing studies, analyses, and program documentation according to AFI 10-601 and AFI 63-101.

3.15.3. Plan, manage, and conduct government DT&E, LFT&E, and integrated testing according to the T&E strategy, the ITP, TEMP or SAMP, and DT&E and LFT&E plans. Maintain insight into contractor activities and oversee PTO T&E activities.

3.15.4. Help PMs make technically informed, objective judgments about contractor DT&E results.

3.15.5. Provide government DT&E results and final reports to the PM and other stakeholders in support of decision reviews and certification of readiness for dedicated OT&E. Provide results and reports to common T&E databases.

3.15.6. Report, validate, and initially prioritize DRs according to TO 00-35D-54, Chapter 2.

3.16. Participating Test Organizations (PTO). PTOs will:

3.16.1. Participate in ITTs and TIPTs as soon as they are formed and as required.

3.16.2. Assist other test organizations as described in program documentation and integrated test plans.

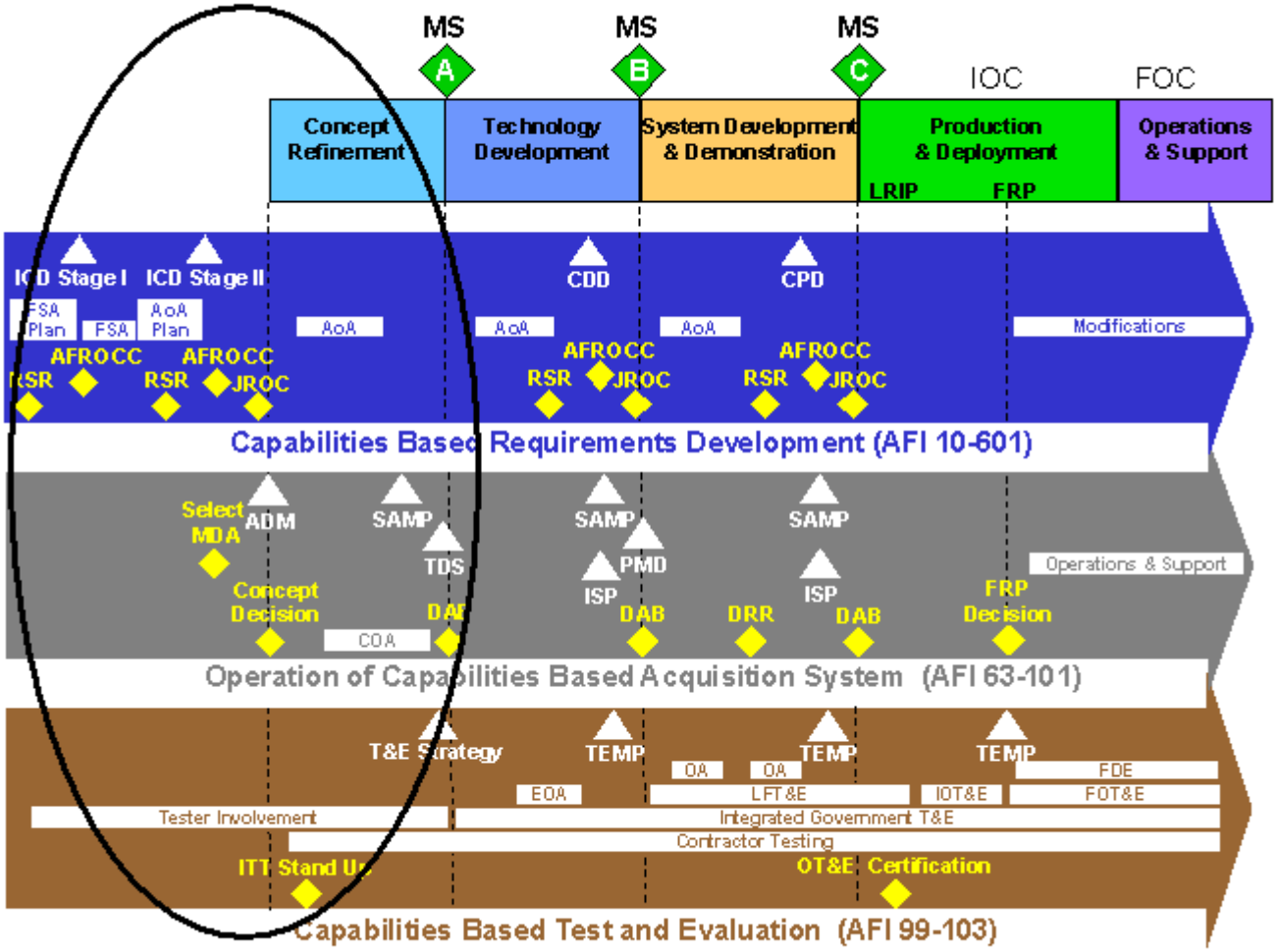
3.16.3. Ensure T&E training is provided for PTO personnel involved in T&E activities.

Chapter 4

T&E ACTIVITIES SUPPORTING THE MILESTONE A DECISION

4.1. Early Tester Involvement. The oval in **Figure 4.1.** encompasses the most important activities prior to and during Concept Refinement that support a MS A decision. This chapter explains testers' roles in these activities. ***NOTE***: The timing of T&E activities and documentation for space and missile acquisition programs is different because KDPs for these programs are phased earlier than typical DoD 5000-series programs as described in *NSS Acquisition Policy 03-01*.

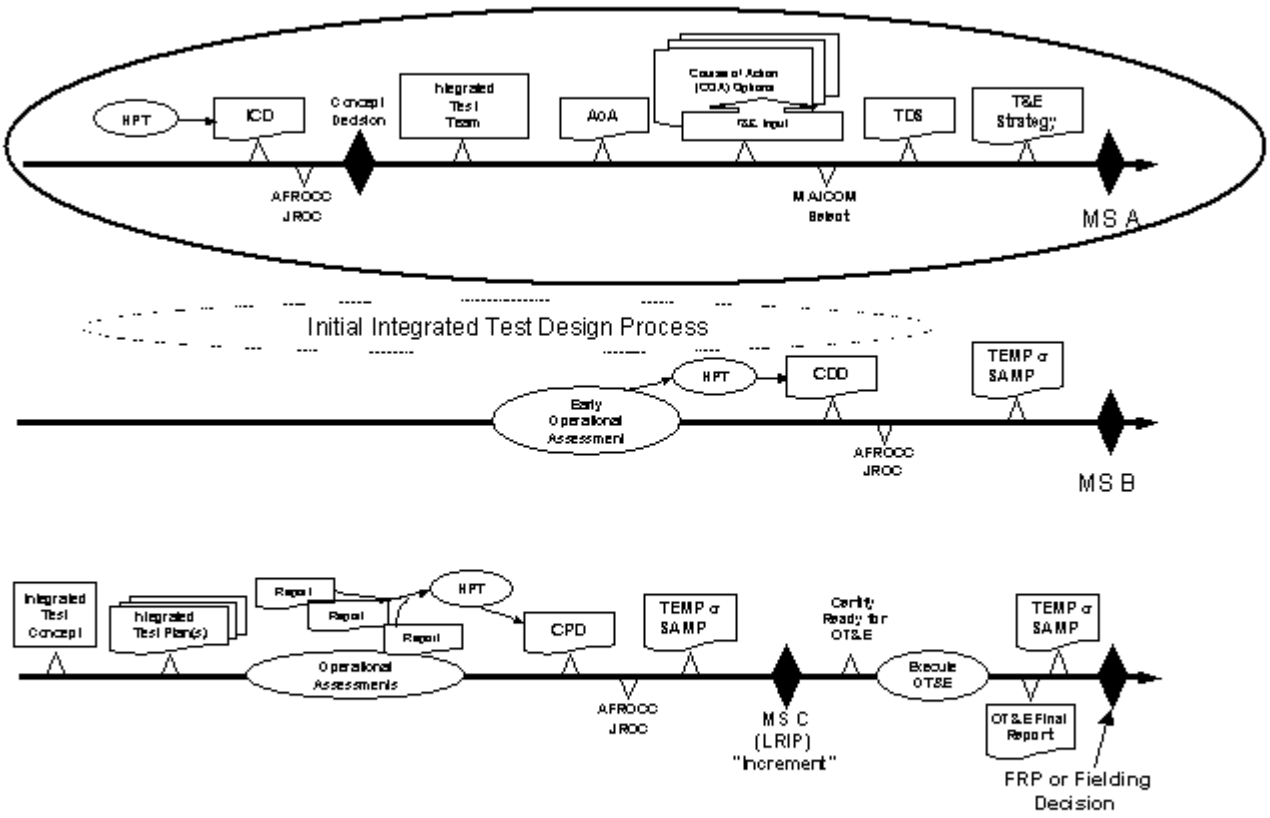
Figure 4.1. Integration of Acquisition, T&E, and Requirements Events Prior to Milestone A.



4.2. Early Tester Involvement in Requirements Development. Early tester involvement starts with participation in the requirements process described in AFI 10-601, CJCSI 3170.01D, CJCSM 3170.01A, and CJCSI 6212.01C. Testers will participate in developing the Requirements Strategy and the Analysis of Materiel Approaches. As high performance team (HPT) members, testers support development of the

Initial Capabilities Document (ICD). Testers will help ensure these documents support development of a T&E strategy, and that operational capability requirements are testable. The documents, studies, and decisions supporting MS A are shown in the oval in **Figure 4.2.**

Figure 4.2. Seamless Verification Concept Flowchart.



Note: When the MAJCOM is the operational tester, FDE or OUE is done in lieu of AFOTEC-conducted OT&E.

4.3. Early Tester Involvement in the Acquisition Process. The ADM officially starts the acquisition process. The PM should be assigned to help lead and fund early study and collaborative efforts. Testers must be involved in the collaborative work that produces the AoA Study Plan, Concept Decision, and the COA.

4.4. Formation of the Integrated Test Team (ITT). Establishment of the ITT will be directed in the new program's initial ADM. Prior to MS A, the SPO (or SPO initial cadre) will take the lead in forming an ITT of representatives from all needed disciplines. Testers who contributed to developing the AoA plan and Concept Decision should form the nucleus of the initial ITT. An ITT is mandatory for all programs. ***NOTE*:** The ITT supercedes the TPWG with expanded responsibilities as described in paragraph **3.14.** As existing TPWGs take on these new responsibilities, the group's name should change to ITT.

4.4.1. **ITT Membership.** The ITT works together as a cross-functional team to map out the grand strategy for testing and evaluating the system. Include representatives from the SPO (or initial SPO cadre), SAF/ACE, SAF/AQ or SAF/US, HQ USAF/TE, HQ USAF/XO, operational MAJCOMs, ALCs, product centers, contractor, developer, science and technology , operational and developmental testers, OSD, requirements sponsors, test facilities, and other stakeholders as needed during various test program phases. Also include representatives from AFIWC, AFC2ISRC, and JITC if required. The ITT should be formed sufficiently early to shape the requirements, acquisition, and T&E strategies depicted in **Figure 4.2.**

4.4.2. **Subgroups.** Test IPTs should be formed to write test plans or handle specific tests or test issues. A "test team" is the group of testers and other experts who write test plans and carry out integrated testing according to specific test plans. A CTF is one way to organize a test team for integrated testing. ***NOTE*:** There is one ITT for each program, but there may be multiple TIPTs and test teams.

4.4.3. **ITT Leadership.** Representatives from the SPO (or SPO initial cadre) and the operational test community will co-chair the ITT. Testers must be proactive in supporting ITT goals even though they may not be formally tasked before the initial ADM is signed.

4.4.4. **Operational MAJCOM Roles.** Operational MAJCOM testers must participate in the ITT upon inception. They must assume the ITT co-chair position if AFOTEC is not involved in the program. As programs mature, AFOTEC OT&E leadership should smoothly transition to MAJCOM operational testers.

4.4.5. **ITT Charter.** A formal, signed ITT charter is required for all ITTs and will describe team membership, responsibilities, resources, and the products for which the ITT is responsible. Charters will be reviewed and updated after each major decision review to ensure testing will be integrated as much as possible within statutory and regulatory guidelines. Changes in membership should reflect the skills required for each phase of the program. HQ USAF/TE will review ITT charters for programs on OSD T&E Oversight.

4.5. Determining the RTO. The RTO is the lead government developmental test organization that is responsible for overseeing and/or conducting DT&E.

4.5.1. **RTO Nomination and Selection.** The ITT initiates selection of an RTO in the T&E strategy prior to MS A. The ITT will submit their RTO decision to the PEO for approval. If an RTO is not needed, rationale should be stated. After approval, the PM will provide the RTO information to SAF/AQ for inclusion in the PMD.

4.5.2. **Appropriate RTO Organizations.** In all cases, the RTO must be qualified to oversee and/or conduct the required testing. During system development, several developmental test organizations may be needed, but only one will be designated as the lead RTO for a specific test phase. The designation of an RTO does not require all associated test activities to be conducted at that organization's geographic location.

4.6. AFOTEC Involvement. AFOTEC will plan and conduct OT&E for all ACAT I and II, and programs on OSD OT&E Oversight as required by Title 10. ITTs, PMs, and MAJCOMs will afford AFOTEC the opportunity to review **all** other projects and programs to determine if an AFOTEC-conducted OT&E is warranted. AFOTEC must inform the ITT of their planned level of involvement as early as practical (preferably before MS A). If AFOTEC determines they will not be involved, they will forward their posi-

tion with written coordination and justification to HQ USAF/TE, along with a recommendation if any additional operational testing is warranted. Coordination must include at least the operational MAJCOM T&E office of primary responsibility (OPR) and the developer. MAJCOM testers will make an assessment to determine if an operational test is warranted. If AFOTEC elects non-involvement during the 12 months prior to the start of operational testing, a negotiated position about who funds the remaining operational testing must be included in AFOTEC's non-involvement letter.

4.7. Lead Service Considerations. When the Air Force is designated the lead Service for multi-Service T&E, the ITT will document the other Services' T&E responsibilities, resources, and methods to eliminate conflicts and duplication. See the *MOA on MOT&E,* for more information.

4.8. Tester Inputs During Concept Refinement. Testers must assist requirements sponsors and acquisition personnel in developing AoA plans, AoAs, COAs, and TDSs. Testers will provide T&E inputs for each alternative developed. Criteria, issues, and measures such as COIs and measures of effectiveness (MOE) developed for these documents will be used in the T&E strategy and subsequent T&E plans.

4.9. T&E Strategy Development. ITT members must develop the T&E strategy according to DoDI 5000.2, Enclosure 5. The T&E strategy must integrate all T&E activities supporting the program and take full advantage of existing investments in DoD ranges and facilities as described in paragraph **4.10.** The T&E strategy must support the requirements and acquisition strategies. All tests, each with specific objectives, must be organized to achieve the greatest possible synergy, efficiency, and effectiveness. The T&E strategy is considered the first iteration of the TEMP, so its structure should follow the TEMP format. DOT&E and USD(AT&L) approve the T&E strategy at MS A for OSD T&E Oversight programs (KDP-B for space programs), and the MDA approves for all other programs. T&E strategy coordination follows the same process as prescribed for a TEMP (see paragraph **5.14.** et seq).

4.10. Early Planning for T&E Resources.

4.10.1. **Securing T&E Ranges and Facilities.** Test planners must contact potential test sites early to obtain estimates of costs and availability. HQ AFMC/DO and the range or facility points of contact (POC) will provide information and assistance on using the Major Range and Test Facility Base (MRTFB) and other government test facilities. See DoDD 3200.11, *Major Range and Test Facility Base (MRTFB)*. For space and space launch ranges, contact HQ AFSPC/XO. See AFI 13-212, Vol I, *Range Planning and Operations*, about use of test and training ranges.

4.10.2. **Use of Government Test Facilities.** Testers will take full advantage of existing investments in DoD ranges, facilities, and other resources, including the use of embedded instrumentation. Test teams should plan to use Air Force test capabilities first, followed by MRTFB facilities, followed by non-DoD government facilities.

4.10.3. **Use of Non-Government Facilities.** Contractor facilities should only be used when government facilities are not available, cannot be modified, are too expensive, or are impractical to use. If the T&E strategy or ITP calls for testing at non-government facilities, the PM must conduct a cost benefit analysis and include these facility requirements in the request for proposal (RFP) and document the final choice in the TEMP.

4.10.4. **Use of Exercises and Experiments.** Air Force testers will use exercises and experiments to take advantage of operationally realistic environments, high threat densities, and massed forces. Test

organizations should take advantage of Joint Expeditionary Force Experiments, Advanced Process and Technology Experiments, and joint and Service war games on a non-interference basis. Experiments may include prototype systems with varying degrees of maturity and configuration control. See AFPD 10-23, *Operational Innovation Program*, AFI 10-230, *Conduct of Key Exercises and Experiments*, and AFI 10-400, *Aerospace Expeditionary Force Planning*.

4.10.5. **Aerial Targets.** For aerial target requirements, see AFI 99-108*, Programming and Reporting Missile and Target Expenditures in Test and Evaluation.*

Chapter 5

T&E ACTIVITIES SUPPORTING THE MILESTONE B DECISION

5.1. Post Milestone A. The ITT will begin integrated test planning based on the T&E strategy. Sustained, high quality tester involvement and collaboration with requirements sponsors and system developers must continue throughout the Technology Development phase as shown in **Figure 5.1.** and **Figure 5.2.** This chapter focuses on early T&E **planning** considerations after MS A in preparation for the SDD phase. It also addresses test **execution** occurring during the Technology Development phase. ***NOTE***: The timing of T&E activities and documentation for space and missile acquisition programs is different because KDPs for these programs are phased earlier than typical DoD 5000-series programs as described in *NSS Acquisition Policy 03-01*.

Figure 5.1. Integration of Acquisition, T&E, and Requirements Events Prior to Milestone B.

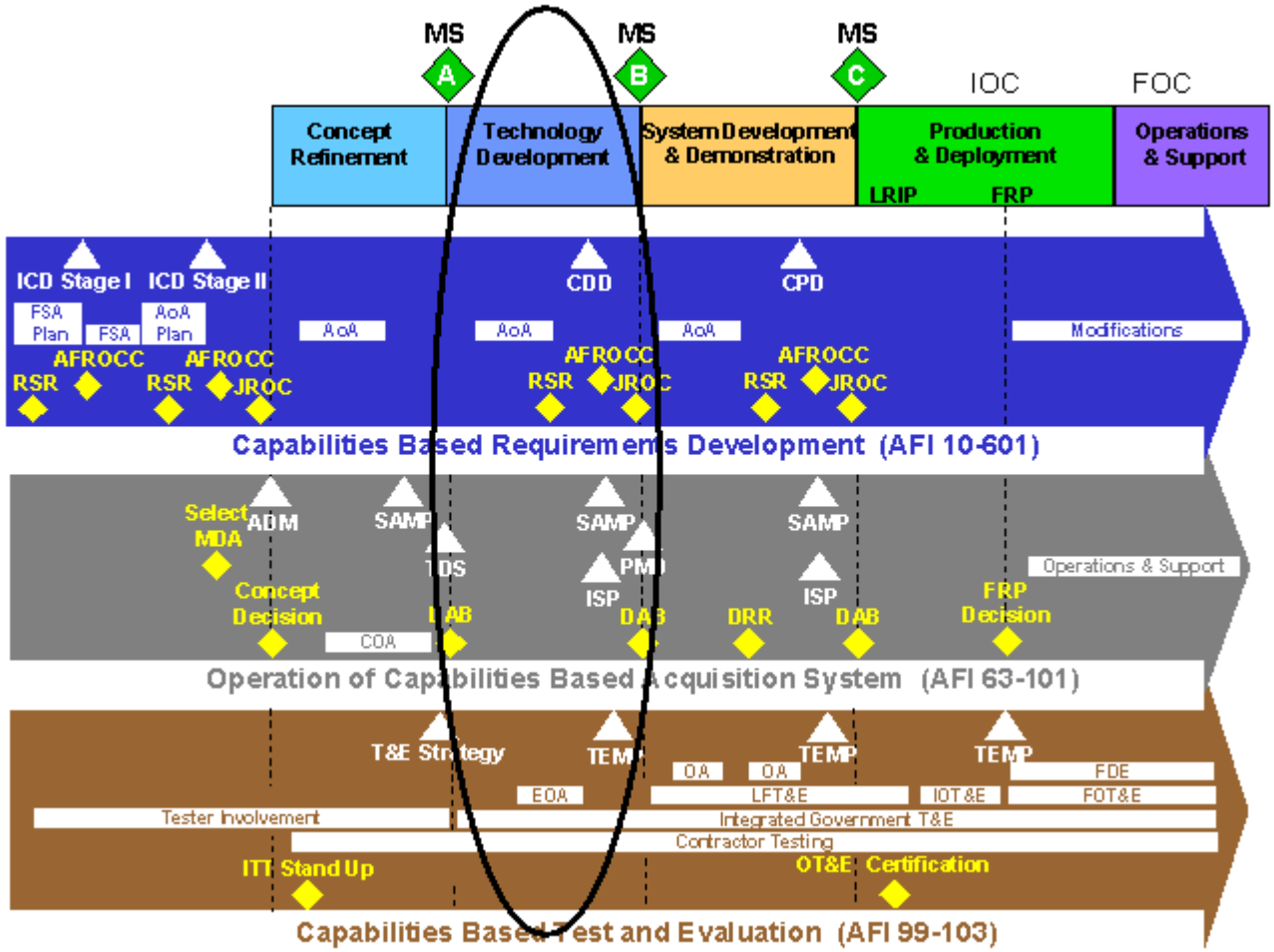
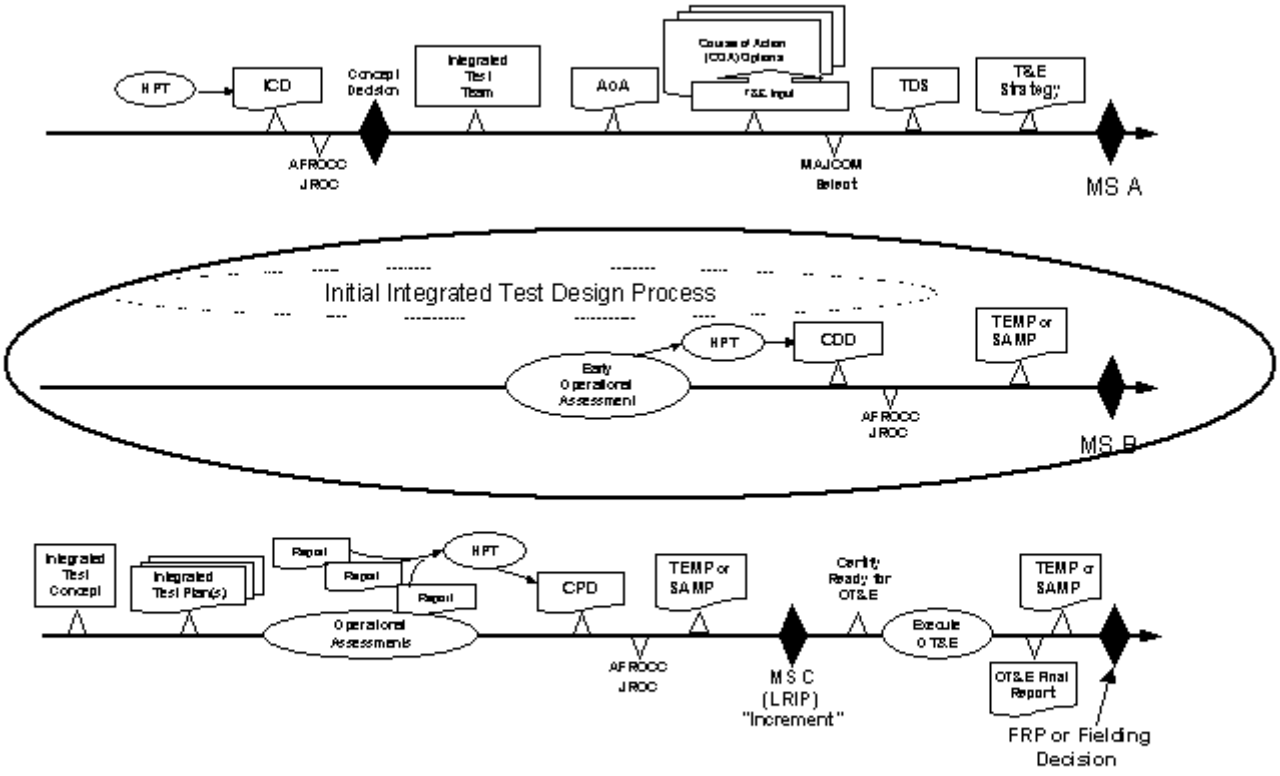


Figure 5.2. Seamless Verification Concept Flowchart.



Note: When the MAJCOM is the operational tester, FDE or OUE is done in lieu of AFOTEC-conducted OT&E.

5.2. Initial Integrated Test Design (IITD) Process. The IITD starts the iterative process of test concept and test plan development that culminates in executable test plans after MS-B. The ITT should initiate the IITD process to refine the T&E strategy into a feasible test approach for the selected COA option and ICD. All test planners must first outline their initial T&E designs, objectives, and known requirements to support development of the MS B TEMP and the post MS-B integrated test concept (ITC). The ITT uses a systems engineering approach to identify and de-conflict the initial COIs, CTPs, test objectives, MOEs, resources, and schedules. Operational testers assist MAJCOMs in developing COIs in the form of questions to be answered in evaluating a system's operational effectiveness and suitability. The IITD process culminates in an ITC that includes an initial description of test scenarios, test locations, exercises, T&E methodologies, operational impact assessments and issues, and projections for future capabilities.

5.3. Critical Technical Parameters (CTP). CTPs are measurable critical system characteristics that, when achieved, allow the attainment of operational requirements. They are technical measures derived from requirements documents. The ITT will ensure CTPs are testable and reflect the system's definition and design for all elements such as hardware components, software, architectures, personnel, facilities, support equipment, and data. Failure to achieve a CTP should be considered an indicator that the system development schedule is behind or the system will likely not achieve an operational requirement.

5.4. Formal Contractual Documents. A System Requirements Document (SRD) will describe operational capability requirements, critical design specifications, and manufacturing requirements. ITT members will check that requirements are accurately described in Section 3 of the SRD, and T&E needs are identified in Section 4. The ITT will review the Contract Data Requirements List (CDRL) to ensure it describes the content, format, delivery instructions, and approval and acceptance criteria for all deliverable contract T&E data. The RFP and statement of work (SOW) will describe the contractor's support to government T&E. These contract documents should make provisions for:

5.4.1. Government review and approval of contractor test plans and procedures before tests commence.

5.4.2. Government insight into contractor testing to ensure systems are maturing as planned.

5.4.3. The contractor's DR system to interface with the government's DR system, including TO-00-35D-54 compliant processes and methodologies, and portability of data into government information management systems.

5.4.4. Contractor T&E support such as failure analyses, data collection, operation of unique test equipment, provision of logistics support, and test reports.

5.4.5. Contractor participation in government test planning forums such as the ITT.

5.5. Contractor T&E Data. Test teams and TIPTs should use as much contractor T&E data as possible if its accuracy can be verified. Contractor T&E data should be visible in a common T&E database.

5.6. Limitations on Contractor Involvement in Operational Testing. Title 10 §2399(d) and (e) place limits on contractor involvement in OT&E. Air Force policy applies these statutory limitations to all operational test programs regardless of ACAT.

5.6.1. **System Contractors.** According to Title 10 §2399(d) and Air Force policy, operational testers must strictly avoid situations where system contractors could reduce the credibility of operational test results, or compromise the realistic accomplishment of operational test scenarios. Title 10 permits limited system contractor involvement in operational testing if the operator plans for the contractor to be involved in the operation, maintenance, and support of the system after it is fielded.

5.6.2. **System Contractor Support to Operational Testing.** System contractors may be beneficial in providing logistic support and training, test failure analyses, test data, and unique software and instrumentation support that could increase the value of operational test data. Explanations of how this contractor support will be used and the mitigation of possible adverse effects must be described in the TEMP, ITP, and operational test plans.

5.6.3. **Support Contractors.** According to Title 10 §2399(e) and Air Force policy, support contractors may not be involved in the establishment of criteria for data collection, performance assessment, or evaluation activities for operational testing. This limitation does not apply to a support contractor that has participated in such development, production, or testing solely in test or test support on behalf of the government.

5.7. Integrating Specialized Testing. The ITT must integrate interoperability certification testing and information assurance testing at the correct points in system development. New or modified software applications should not be connected to a DoD-owned network without these assessments which require a Defense Information Systems Agency-certified test network and certified test team. Information tech-

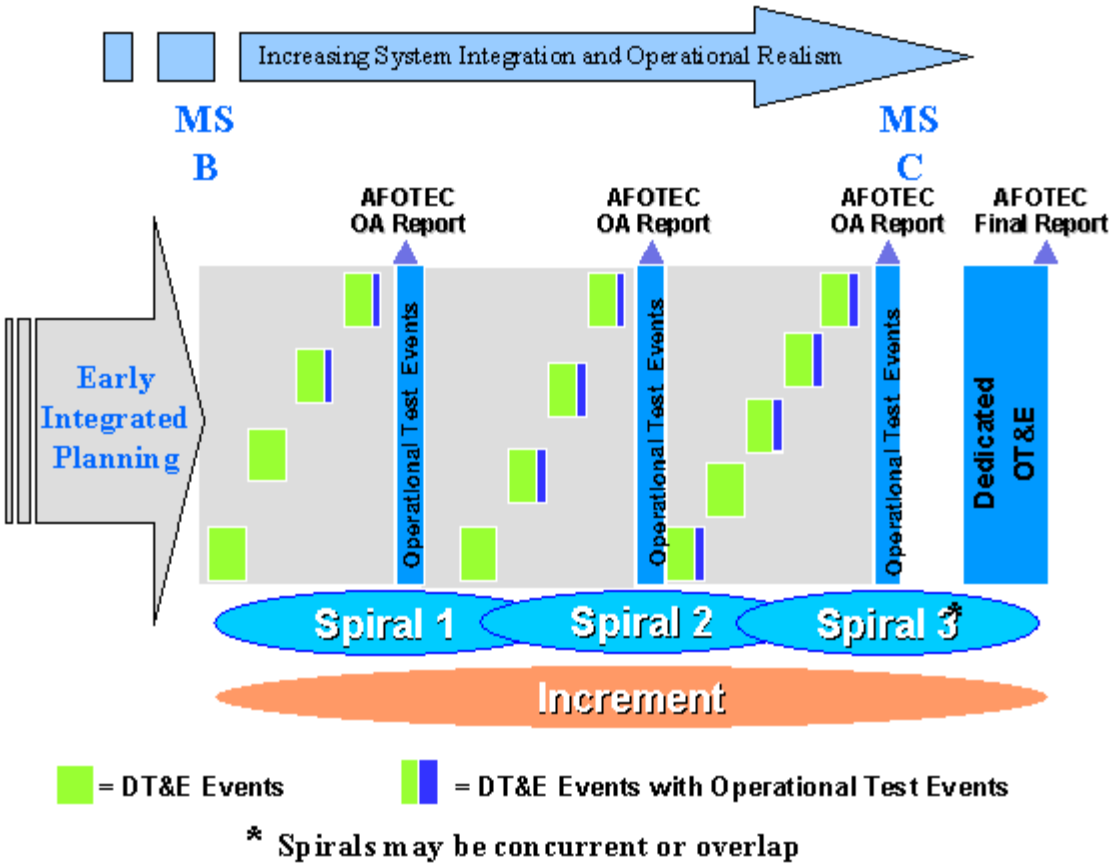
nology (IT) and National Security Systems (NSS) should be tested according to DoDI 8500.2, *Information Assurance (IA) Implementation,* and CJCSI 6212.01C, *Interoperability and Supportability of Information Technology and National Security Systems*.

5.8. Modeling and Simulation (M&S) in Support of T&E. Plan to use available and reusable M&S tools and DSMs from the Air Force Modeling and Simulation Resource Repository (AFMSRR) before building new M&S resources. Check the Air Force Agency for Modeling and Simulation (AFAMS) website at **http://www.afams.af.mil/**. Document M&S use in the Modeling and Simulation Support Plan. See AFI 16-1001, *Verification, Validation, and Accreditation (VV&A),* and AFI 16-1002.

5.9. Early DT&E Planning.

5.9.1. **Planning for Integrated T&E.** The ITT will integrate operational test events throughout DT&E to provide additional test realism, decrease overall duplication of effort, and increase test efficiency. Operational suitability will be given equal consideration with operational effectiveness. Test limitations and deferrals must be explained in test plans and the TEMP. (See AFI 10-602 and DoD 3235.1-H, *DoD Test and Evaluation of System Reliability, Availability and Maintainability A Primer*.) Multiple sets of test objectives will be accomplished together within statutory and regulatory guidelines. **Figure 5.3.** is a model of how developmental and operational test events can be integrated to reduce the scope, cost, and schedule of T&E conducted during the SDD phase. Integrated testing will be the preferred approach unless it can be shown that it adds unacceptable costs, delays, or technical risks. Existing safety review processes will not be compromised. More information is in paragraphs **6.2.** through **6.5.**

Figure 5.3. Early Planning for Integrated T&E Activities.



5.9.2. **Using MAJCOM Units to Support DT&E.** SPOs, Battlelabs, or government developmental test organizations may request operational MAJCOM units to support DT&E activities only after obtaining concurrence from that organization's MAJCOM headquarters. Such tests should be restricted to low-risk DT&E activities to demonstrate military utility under the direct supervision of the PM's or a government DT&E organization's assigned test manager. These activities will be called "DT&E Assists" (or similar name) to indicate they are not operational testing.

5.10. Live Fire Test and Evaluation (LFT&E) Planning. The following policies and guidance supplement statutory direction in Title 10 §2366. The *Defense Acquisition Guidebook* (Part 3 and Appendix 3) provides additional guidance for implementing LFT&E legislation and OSD requirements for LFT&E.

5.10.1. **Implementation.** LFT&E results must support system design and production decisions for covered systems. The focus and funding for LFT&E should be on the system components immediately related to the development or modification program, but the resultant evaluation must be at the system level. Contact the 46th OG/OGM, Eglin AFB, for assistance with development of LFT&E strategies, waivers, and alternative plans.

5.10.2. **Determining Covered System Status.** The PM and ITT must first assess if their system is a "covered system" or "covered product improvement program." PEOs and Capability Directors must continually review their portfolios for any programs "covered" under Title 10 §2366. When a poten-

tial LFT&E candidate is identified, they must notify the ITT, PM, the 46th OG/OGM, and HQ USAF/TEP as early as possible. The 46th OG/OGM can facilitate discussions to help determine a corporate Air Force position and develop a recommendation to DOT&E.

5.10.3. **LFT&E Strategy Approval.** Once an affirmative determination of covered status is made, the 46th OG/OGM, with the assistance of the ITT, must develop an LFT&E strategy and define the level of funding as soon as practical after MS A (or equivalent point). The strategy must be structured so any design deficiencies uncovered during SDD may be corrected before proceeding beyond LRIP. Technology projects and ACTDs meeting the statutory criteria are also required to undergo LFT&E. The ITT will describe the LFT&E strategy and plans in the TEMP or SAMP T&E annex. LFT&E must be fully integrated into the continuum of testing. DOT&E coordinates on and approves the LFT&E strategy prior to MS B (or equivalent point) or a waiver must be submitted.

5.10.4. **Requests for LFT&E Waivers.** If realistic, full-up, system-level survivability or lethality testing is unreasonably expensive and impractical, the ITT and/or PM may submit a waiver request and alternative LFT&E strategy to DOT&E and USD(AT&L) for ACAT ID programs, or to the CAE for less than ACAT ID programs. The waiver request and alternative strategy must first go through DOT&E and then to USD(AT&L) prior to MS B, whereupon a report and formal certification to Congress will be issued. After MS B, DoD cannot grant waivers to full-up testing except through congressional direction. Document the LFT&E waiver in the TEMP or SAMP T&E annex.

5.10.5. **Alternative LFT&E Strategy.** The alternative strategy does not alleviate the statutory requirement for survivability or lethality testing. The alternative strategy must include LFT&E of components, subassemblies, and/or subsystems which, when combined with M&S and combat data analysis, will result in confidence in the survivability (or lethality) of the system.

5.10.6. **Alternative Strategy and Testing for Major Modifications.** In the case of major modifications or new production variants, the alternative LFT&E strategy and detailed plans must focus on configuration changes that could significantly affect survivability or lethality. Potential interactions between portions of the configuration that are changed and those that are not changed must be assessed. The assessment results must include a whole system analysis of the survivability and vulnerability impacts on the total system. Alternative LFT&E will not be required on components or subsystems unrelated to the modification program.

5.10.7. **Detailed LFT&E Plans.** DOT&E reviews and approves all LFT&E plans prior to commencement of LFT&E. All LFT&E must be completed and test reports submitted 45 days before the beyond LRIP decision review. *Defense Acquisition Guidebook* (Appendix 3, Annex B) lists the mandatory contents of LFT&E plans.

5.11. Operational Assessment Planning and Execution.

5.11.1. **Early Operational Assessments (EOA).** During the Technology Development phase, EOAs are planned and conducted as required to provide operational inputs to requirements and system development prior to MS B. The EOA supports development of the Capability Development Document (CDD), integrated test concepts and plans, and the MS B decision. The scope and content of EOAs should be tailored to obtain very early estimates using any available data.

5.11.2. **Operational Assessments.** OAs conducted in the SDD phase are outlined prior to MS B. OAs must be tailored to emphasize an integrated testing approach for assessing system capabilities in preparation for dedicated operational testing as shown in **Figure 5.3.**.

5.12. Tester Involvement in the Capability Development Document (CDD). Testers must continue assisting requirements sponsors in refining operational capability requirements according to AFI 10-601. Testers will participate in HPTs by providing expertise, lessons learned, and data from EOAs, OAs, and integrated testing. Testers will help ensure system key performance parameters and MOEs are reasonable and testable.

5.13. Single Acquisition Management Plan (SAMP). A SAMP is required for all ACAT I and II programs, and is optional for ACAT III programs. The PM must include all ITT members when preparing the T&E portions of the SAMP. (Space programs produce an IPS rather than a SAMP.) Critical elements of the TEMP (Parts II, III, IV, and V) should be incorporated in the SAMP, or the entire TEMP included as a T&E annex. If program risks are high, the TEMP may remain the primary T&E management document. For OSD T&E Oversight programs, DOT&E retains final approval authority over all contents related to or impacting OT&E. See SAF/AQ's *Single Acquisition Management Plan Guide*.

5.14. Test and Evaluation Master Plan (TEMP). The TEMP integrates the requirements, acquisition, T&E, and sustainment strategies, along with all T&E schedules, funding, and resources, into an efficient continuum of integrated testing. The PM, working through the ITT, is responsible for preparing a TEMP prior to MS B (KDP-C for space programs) for ACAT I, IAM, ACAT II, and all OSD T&E Oversight programs. TEMPs are **strongly encouraged** for all other programs.

5.14.1. **TEMP Organization.** The TEMP should be written according to the recommended format in the *Defense Acquisition Guidebook*, Appendix 2. The preferred option for TEMP organization is to put all DT&E and integrated T&E in Part III, and put dedicated operational testing in Part IV. The completed TEMP conveys:

5.14.1.1. The linkage between the requirements, acquisition, T&E, and sustainment strategies.

5.14.1.2. The linkage between CONOPs, operational requirements and architectures, system characteristics, CTPs, COIs, MOEs, and increments of capability.

5.14.1.3. Organizational relationships among the contractor(s), PM, RTO, PTO(s), and operational testers.

5.14.1.4. Integrated test methodologies.

5.14.1.5. Test resources.

5.14.1.6. Test limitations and test deferrals (see paragraphs **5.19.** and **6.4.2.**).

5.14.1.7. The LFT&E strategy and plans, and the strategy for system certification of readiness for dedicated operational testing.

5.14.1.8. MAJCOM testing, to include operational testing for follow-on increments in Part IV.

5.14.2. **TEMP Submittal and Coordination.** The ITT will forward a TEMP final draft "in parallel" to all stakeholder organizations represented on the ITT for pre-coordination review. ITT representatives are expected to verify concurrence or identify outstanding issues within 30 days. Dissenting organizations must provide a position statement, to include alternatives, or formal non-concurrence on

the draft TEMP within this timeframe. Following this pre-coordination period, the PM will sign the TEMP and staff in parallel to all required "concurrence signature" organizations below the Air Staff level. For all OSD T&E Oversight programs, the PEO or Capability Director will submit the TEMP to HQ USAF/TE and the CAE for formal Service-level approval signatures before final submission to OSD (i.e., USD(AT&L)/DS and DOT&E). For programs not requiring OSD approval, the MDA is the final Service approval authority. If the TEMP is going to OSD or another Service for any reason, HQ USAF/TE and CAE (or MDA if appropriate) signatures are required.

5.14.3. **Multi-Service TEMPs.** The lead Service is responsible for coordinating multi-Service TEMPs. Signatures from the equivalent decision authorities in the other participating Services must be attained before TEMP submission to HQ USAF/TE, the CAE (or MDA if appropriate), and OSD.

5.14.4. **Schedule.** TEMPs requiring OSD approval should be submitted to the PEO 90 days prior to the decision review. See **Attachment 2** for coordination timeline requirements. After OSD's comments are incorporated, the CAE should submit the **final** Service-approved TEMP 10 days prior to the decision review.

5.14.5. **TEMP Updates and Changes.** The PM and ITT will update the TEMP prior to MS C and the FRP decision according to DoDI 5000.2. Changes will also be made whenever the program has significant changes. Staffing will proceed as described in paragraph **5.14.2.**

5.14.6. **When a TEMP Is No Longer Required.** Once a program's acquisition is complete and COIs satisfactorily resolved, a TEMP may no longer be required. The ITT should initiate requests to cancel the TEMP for programs on OSD T&E Oversight. Submit requests and justification through HQ USAF/TE to OSD. See *Defense Acquisition Guidebook*, Chapter 7 and Appendix 2.

5.15. Testing COTS, NDI, and GFE. PMs must not disregard T&E of COTS, NDI, and GFE. The operational effectiveness and suitability of these items and any military-unique applications must be tested and evaluated before a FRP or fielding decision. The ITT will plan to take maximum advantage of pre-existing T&E data to reduce the scope and cost of government testing. More information is available in USD(AT&L)'s handbook SD-2, *Buying Commercial & Non-developmental Items: A Handbook*, available at **http://dodssp.daps.mil**. IT and NSS should be tested according to DoDI 8500.2 and CJCSI 6212.01C.

5.16. T&E Funding Sources. The funding sources for T&E depend on the nature and purpose of the work and the type of testing. Explicit guidance is in DoD 7000.14-R, *Financial Management Regulation*, Vol 2A, Chapter 1; AFI 65-601, Vol 1, Chapter 14; and AFI 99-109. Testers must check these documents before committing funds. Direct assistance is available from SAF/FMBI, SAF/AQXR, and HQ USAF/TER.

5.17. Deficiency Reporting (DR) Process. All Air Force organizations must use TO 00-35D-54, Chapter 2, and AFI 63-501 according to AFPD 63-5, *Quality Assurance*. Directions for technical data deficiencies are in TO 00-5-1, *Air Force Technical Order System*. The PM has overall responsibility for establishing and administering a DR process and procedures for reporting, screening, validating, evaluating, tracking, and resolving DRs originating from government sources. A waiver must be attained from HQ AFMC/EN if the required DR system is not used. If a contractor-based DR system is planned, the RFP and SOW must require the contractor's DR system to interface with the government's DR system. See paragraph **6.10.**.

5.18. Program Management Directive (PMD). The PMD provides official HQ USAF documentation and direction for Air Force programs (both acquisition and sustainment) and associated T&E activities. The ITT will review PMDs to ensure government test organizations and their key responsibilities are correctly identified so as to ensure fully integrated testing.

5.19. Test Deferrals, Limitations, and Waivers. A test deferral is the delay of testing and/or evaluation of a specific CTP, operational requirement, or COI to a follow-on increment. A test limitation is any condition that hampers but does not preclude adequate test and/or evaluation of a CTP, operational requirement, or COI during a T&E program. The ITT and the PM will document test deferrals and test limitations in test plans and the TEMP or SAMP T&E annex. Test limitations and test deferrals do not require waivers, but must be described in test plans and the TEMP or SAMP T&E annex. These test limitations and test deferrals are considered approved when the parent document is approved. Waivers for not conducting OT&E mandated by statute or this AFI will not be approved. (See **Attachment 1** for definitions and paragraph **6.4.2.** for more details.)

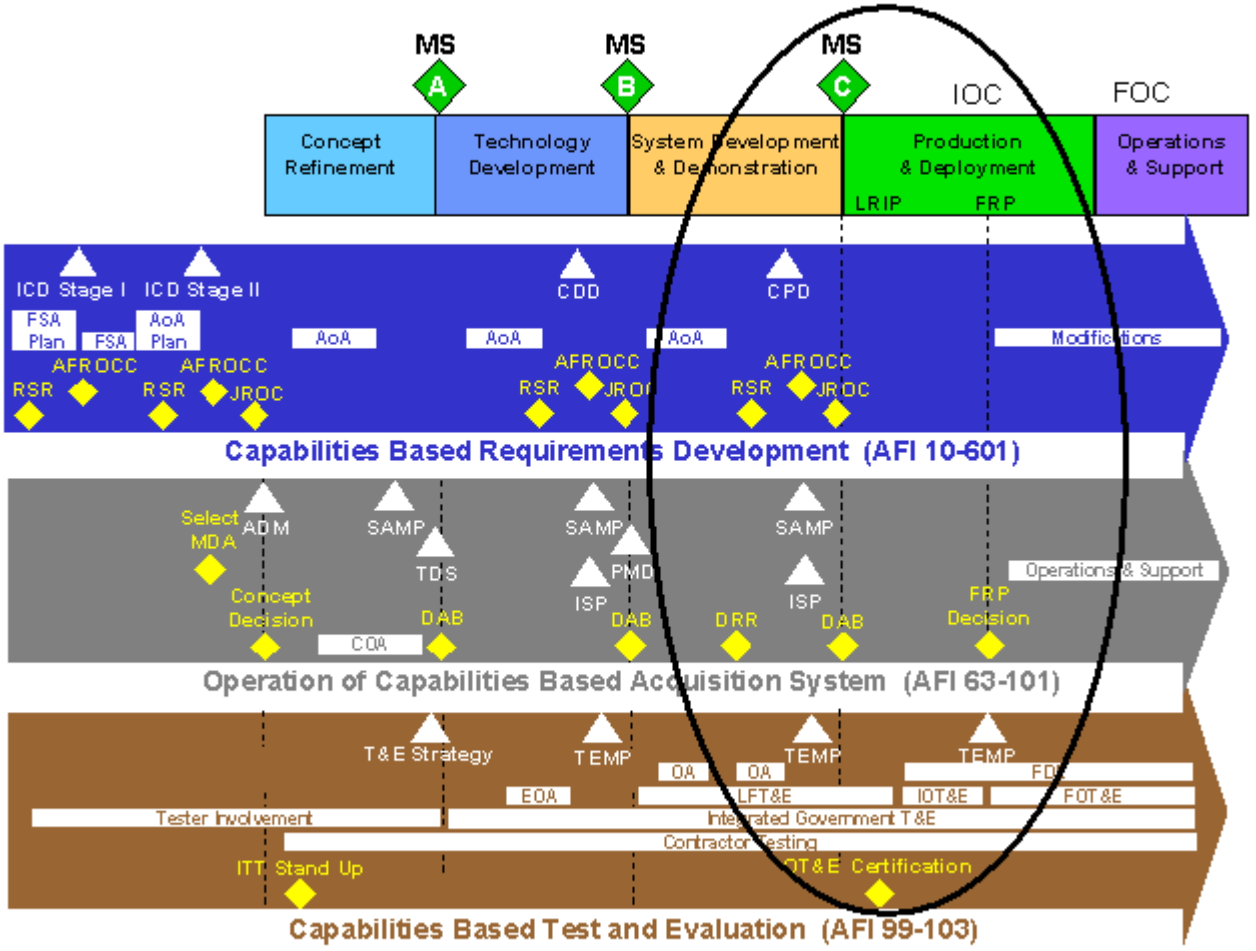
5.20. Precedence Ratings. To help prioritize T&E projects, all systems receive a precedence rating based on the nature of the system, its contribution to national security, and its overall Air Force mission according to AFI 16-301, *U.S. Air Force Priority System for Resources Management.* The type of testing conducted has no impact on the assigned precedence rating assigned. Everyone involved in the program will use the assigned precedence rating when scheduling test resources.

Chapter 6

T&E ACTIVITIES IN SUPPORT OF THE MILESTONE C AND PRODUCTION DECISIONS

6.1. Post Milestone B. The ITT will direct the execution of integrated test plans and activities supporting the MS C, FRP, and fielding decisions shown in the oval in **Figure 6.1.** This chapter focuses on test execution during the SDD and Production and Deployment phases, and follow-on increments and sustainment during the Operations and Support phase. ***NOTE***: The timing of T&E activities and documentation for space and missile acquisition programs is different because KDPs for these programs are phased earlier than typical DoD 5000-series programs as described in *NSS Acquisition Policy 03-01*.

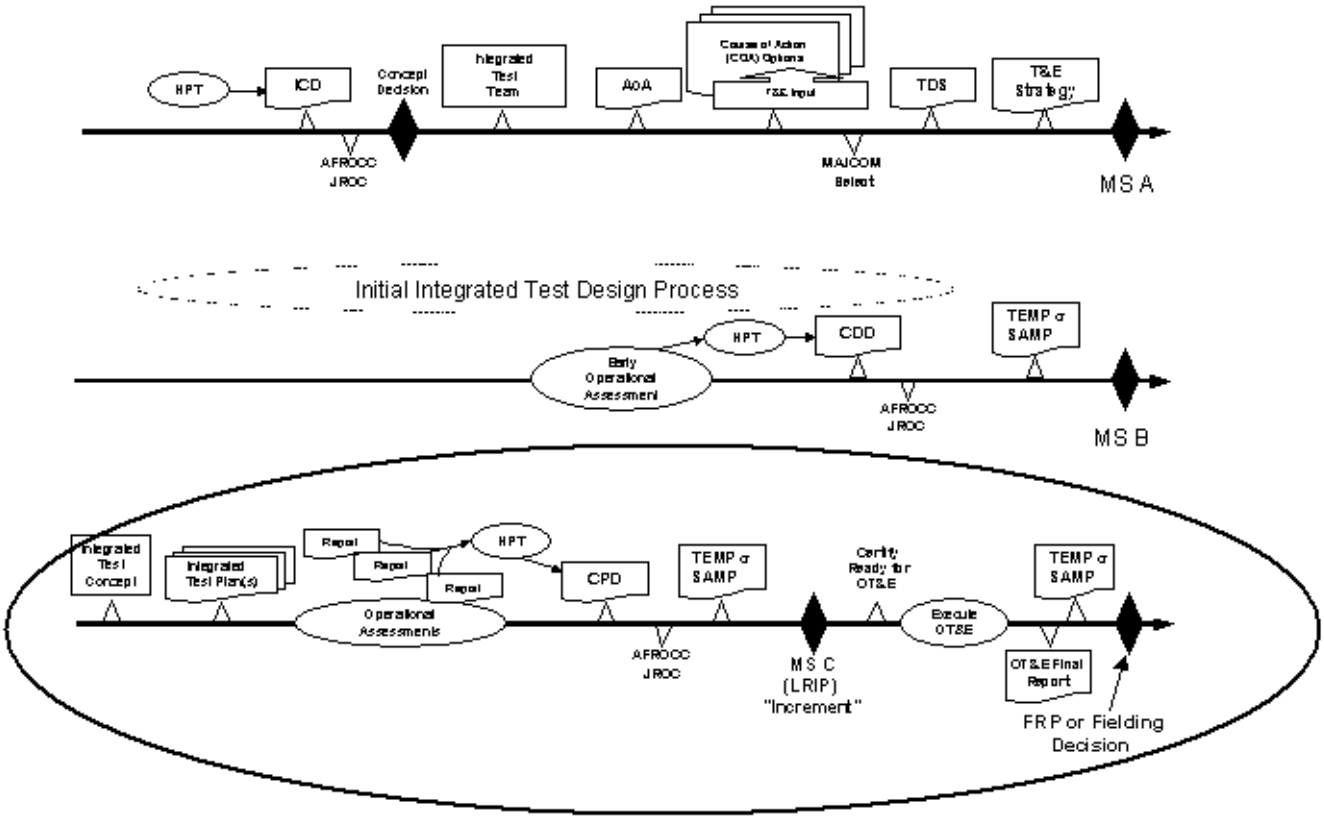
Figure 6.1. Integration of Acquisition, T&E, and Requirements Events Prior to Milestone C.



6.2. Developing Integrated T&E Plans. The ITT should continue refining the IITD into an integrated test concept (ITC) to support the development of the ITP as shown in the oval in **Figure 6.2.** The ITC should describe an executable test approach for the validated operational capability requirements. Con-

tinue using the systems engineering approach to refine and finalize the COIs, CTPs, test objectives, MOEs, measures of performance (MOP), resources, and schedules. Test teams will execute integrated T&E plans that meet as many DT&E and operational test objectives as possible prior to dedicated operational testing. A series of OAs should be integrated into the T&E continuum to reduce program risk and minimize the overall number of test events without compromising the requirements of Title 10.

Figure 6.2. Seamless Verification Concept Flowchart.



Note: When the MAJCOM is the operational tester, FDE or OUE is done in lieu of AFOTEC-conducted OT&E.

6.3. Integrated Test Plan (ITP). The ITP integrates all individual contractor and government test plans into an interlocking series of evaluations focused on the current increment, with follow-on increments described in lesser detail. The ITT must plan for OAs intermingled with operationally relevant DT&E to produce increasing amounts of operationally relevant data from spiral to spiral within each increment. The ITP should use M&S tools and DSMs for test design, systems engineering, data evaluation, and to supplement, augment, and extrapolate available T&E data wherever practical.

6.3.1. The ITP should support each spiral with DT&E and an OA addressing system maturity, operational impacts, and readiness for dedicated operational testing. OA reports should be planned to describe system capabilities and limitations as measured against operational requirements and employment concepts. The remaining actions required to reach the desired capabilities must be out-

lined. Timely, credible, and continuous feedback must be provided to developers and decision makers. The ITP should plan to address most of the COIs and MOEs before dedicated operational testing begins.

6.3.2. The ITP should culminate with dedicated operational testing that concentrates on mission impacts and unanswered COIs, MOEs, and MOPs. The operational test plan may use operationally relevant data collected during previous testing to verify system capabilities in the approved capability production document (CPD) for the fielded item.

6.4. Realistic Testing. Title 10, OSD policy, and Air Force policy require operational testers to conduct tests in as realistic an operational environment as possible to determine system operational effectiveness, suitability, and assess impacts to wartime and peacetime operations. Test scenarios should be developed that reflect progressively more strenuous conditions. See descriptions of operational testing in paragraph **2.6.** et seq.

6.4.1. **Limitations on Use of M&S.** According to Title 10 §2399(h), dedicated OT&E will not be based solely on computer modeling, simulation, or an analysis of system requirements, engineering proposals, design specifications, or any other information contained in program documents. M&S tools and DSMs must receive sufficient verification, validation, and accreditation (VV&A) according to AFI 16-1001 and AFI 14-206, *Modeling and Simulation*.

6.4.2. **Deferment of Operational Testing.** Operational testers will not defer testing of any COIs or operational requirements to future increments unless planned for in the acquisition strategy and ITP. If an unplanned deferral is unavoidable at the MS C or FRP decision, the MDA, in consultation with HQ USAF/TE, will decide on the best strategy for completing the deferred testing. The decision will be documented in an approved ADM, TEMP, or SAMP T&E annex, and a waiver is not required. See paragraph **5.19.**

6.4.3. **Support of AFOTEC-Conducted Operational Testing.** MAJCOM operational units, ALCs, and DT&E organizations may be tasked to support AFOTEC-conducted operational testing. This support will be documented in PMDs, TEMPs, TRPs, test plans, MOAs, and MAJCOM test project orders. AFOTEC will prepare TRPs in time to budget during the POM cycle. Test resource shortfalls and proposed solutions will be submitted to appropriate resource forums in AFPAM 38-102, Chapter 31.

6.5. Integrated Technical and Safety Reviews. Independent government technical and safety personnel will examine the technical and safety aspects of T&E plans that involve government resources prior to commencement of test activities. All test organizations must establish procedures for when and how these reviews will be accomplished.

6.5.1. **Technical Review Board (TRB).** The TRB assesses the soundness of system designs and test plans to reduce test risk. Technically qualified personnel with test management experience, but who are independent of the test program, will perform these reviews. As a minimum, technical reviews will assess test requirements, techniques, approaches, and objectives. The TRB will also ensure that environmental assessments have been completed as required by Title 32, Code of Federal Regulations, Part 989, *Environmental Impact Analysis Process,* and referenced in the test plan.

6.5.2. **Safety Review Board (SRB).** The SRB assesses whether the T&E project's safety plan has identified and mitigated all health and safety hazards according to AFI 91-301, *Air Force Occupa-*

tional and Environmental Safety, Fire Protection and Health (AFOSH) Program. SRB members must be technically qualified and independent of the test program. At the recommendation of the SRB, the PM and all test organizations will eliminate or mitigate identified hazards. All test organizations will set up procedures for controlling and supervising tests consistent with the risk involved and according to local range safety criteria. See AFI 91-202, *The US Air Force Mishap Prevention Program*. Mishap accountability must be clearly established according to AFI 91-204, *Safety Investigations and Reports,* prior to conducting tests.

6.5.3. **Nonnuclear Munitions Safety Board (NNMSB).** The NNMSB will review and approve all newly developed live, uncertified munitions, fuses, and initiating devices prior to airborne testing or expenditures according to AFI 91-205, *Nonnuclear Munitions Safety Board*.

6.6. Certification of System Readiness for Dedicated Operational Testing. The PM will implement a system certification and operational test readiness review process as early as practical during SDD. The certification process in AFMAN 63-119 is mandatory for reviewing programs in all ACATs. Tailor the process to suit program objectives. See DoDI 5000.2, paragraph E5.6, for additional requirements.

6.6.1. **The Readiness Certification Process.** The CAE (or as delegated) is the "certifying official" who determines the overall scope and schedule for the operational test readiness review and certification process. The certification process must be a continuous effort, not a single event in time. How and when the certification process is implemented will be described in the TEMP. To be certified ready for dedicated operational testing, the system must be mature and demonstrate stabilized performance in an operationally relevant environment, and all necessary test support must be available as planned. The system must have a high likelihood of a successful operational test. Identified shortfalls will be remedied before dedicated operational testing starts, or negotiated work-around solutions developed.

6.6.2. **Final Certification of Readiness for Dedicated Operational Testing.** Final certification of system readiness must be done approximately 30 days prior to the planned start of dedicated operational testing to allow time for last minute adjustments. Certification requires a formal briefing to the CAE or designated official. The briefing shall address DT&E results, conclusions, recommendations, and an assessment of the system's capability to meet operational requirements. Once the system has been certified by the CAE (or as delegated), the system is ready to enter dedicated operational testing.

6.7. Briefings and Plans for Operational Testing. DOT&E requires operational testers to present and submit briefings and written plans discussed below for programs on OSD OT&E Oversight. See **Attachment 2** for a summary.

6.7.1. **Operational Test Concept Briefings.** According to DoDI 5000.2, DOT&E requires a "test concept" briefing a minimum of 120 days before the start of dedicated operational tests for programs on OSD OT&E Oversight. HQ USAF/TEP will arrange for corporate Air Force-level reviews of test concept briefings. Operator and developer representatives are required to attend these briefings. A pre-brief to HQ USAF/TE and Air Staff agencies is required before going to DOT&E. For multi-Service programs, the other Services must be briefed. DOT&E may elect to defer this requirement and accept a later briefing of the final operational test plan as described in paragraph **6.7.2.** in lieu of the test concept briefing. Operational test concept briefings for OAs should be presented a minimum of 30 days before test start for programs on OSD T&E Oversight. No briefings are required for non-Oversight programs.

6.7.2. **Operational Test Plans and Test Plan Briefings.** An operational test plan is due to DOT&E a minimum of 60 days prior to test start. DOT&E may request, or the operational test organization may elect, to present a briefing to accompany the final test plan. This briefing will be coordinated the same way as an operational test concept briefing.

6.8. DOT&E Test Plan Approval. OAs and OT&Es for programs on OSD OT&E Oversight may not start active testing until DOT&E approves the adequacy of the test plan in writing. All information required for OSD T&E Oversight programs is summarized in **Attachment 2**. HQ USAF/TEP will assist with the review, coordination, and submission of this information. DOT&E approval is required on the operational test portions of integrated T&E plans prior to the start of operational testing.

6.9. Common T&E Data Management. A common T&E database accessible to all program stakeholders will be used for all T&E data for the system under test. All test teams will establish rigorous data collection, control, accountability, and security procedures for T&E data. Operational testers may use data from sources such as integrated T&E and OAs to augment or reduce the scope of dedicated operational testing if the data can be verified as accurate and applicable. Operational testers must allow open data sharing and non-interference observation by all other testers, the system developer, contractor, operators, DOT&E, and the PM.

6.9.1. **Tracking T&E Data.** To avoid using questionable test data, test teams must verify the origin and integrity of any data used in final reports, i.e., whether the data came from contractors, DT&E, integrated T&E, other Service OTAs, or dedicated Air Force operational tests.

6.9.2. **Joint Reliability and Maintainability Evaluation Team (JRMET).** The PM will establish a JRMET (or similar TIPT) to assist in the collection, analysis, verification, and categorization of reliability, maintainability, and availability (RM&A) data. The JRMET may also review applicable DRs and recommend whether or not they should be closed. When scoring RM&A data, the PM or designated representative will chair the JRMET during DT&E; an operational test representative will chair during dedicated operational testing.

6.9.3. **Test Data Scoring Board (TDSB).** The TDSB is a government-only group that compiles, reviews, and scores all available RM&A data. The PM and operational testers will establish a TDSB and jointly designate a chairperson. The operational test representative will chair during dedicated operational testing. The TDSB should include representatives from the RTO, operational testers, PTOs, operating command(s), and other participating commands.

6.9.4. **Timely Release of T&E Data.** All test teams will release validated test data and factual information as soon as practical to other testers and stakeholders. This data may be preliminary and should be identified as such.

6.9.5. **Disclosing Test Data to Foreign Nationals.** To determine what test data or materials may be disclosed to foreign nationals, use AFPD 16-2, *Operations Support, Disclosure of Military Information to Foreign Governments and International Organizations*, and AFI 61-204, *Disseminating Scientific and Technical Information*. See paragraphs **7.12.** and **7.13** about the release and protection of test information.

6.10. Deficiency Reports (DR). All testers are responsible for identifying deficiencies and enhancements and submitting DRs. Government testers must clearly distinguish between DRs for deficiencies versus "nice-to-have" enhancements going beyond the scope of the system operational requirements.

Government testers will use the government-run DR system described in Chapter 2 of TO 00-35D-54 and AFI 63-501, *Air Force Acquisition Quality Program*. See DR planning considerations in paragraph **5.17.**. Test teams will determine the optimum time to begin formally submitting DRs. The contractor-based DR system may suffice for the early stages of development, but the government-based DR system must become the primary method of reporting and tracking DRs during government-conducted T&E.

6.10.1. **Accurate Categorization of DRs.** When submitting or screening DRs, testers must ensure the DR's severity is accurately represented by assigning the proper DR category as defined in TO 00-35D-54 and **Attachment 1** of this AFI. Further categorize software DRs using AFI 10-602, **Attachment 8**, **Table A8.1**.

6.10.2. **DRs from DT&E.** The ITT will periodically convene a Deficiency Review Board to prioritize all open DRs. The PM will convene a JRMET to review DRs related to RM&A. Prioritized DRs will be used in preparation for certification of readiness for dedicated operational testing. If the PM cannot correct or resolve Category I or high priority Category II DRs before dedicated operational testing begins, or defers fixes for these DRs, operational testers and operators must assess the impacts. The PM and ITT must reach agreement prior to certification of readiness for operational testing and develop a plan for regression testing.

6.10.3. **Operational Tester DR Responsibilities.** Prior to the FRP decision review, operational testers and operators will complete a final prioritization of all open DRs for resolution and funding. The MAJCOM's priorities must be used for rank-ordering these DRs. The final priorities will be forwarded to the PM to help direct corrective actions and will be listed in the final report.

6.10.4. **Tracking and Closing DRs.** Not all open DRs may receive funding or be corrected after a system is accepted for operational use. The database of open DRs may provide the only documentation of unsatisfactory conditions or worthwhile system enhancements. At no time will the SPO unilaterally close or downgrade DRs without formal consultation with the originating test organization and/or MAJCOM project officer. MAJCOM project officers must continue to track open DRs until they are funded and corrected, or the MAJCOM concurs with closing them.

6.11. Integrated Testing During Sustainment and Follow-on Increments. Follow-on increments and modifications are tested and evaluated in basically the same way as the first increment. Operational test and evaluation is required for each increment of capability prior to release to the user. This testing will be structured according to the program acquisition strategy. The T&E activities described in this chapter are tailored and repeated during the Operations and Support phase. Planning for these T&E activities is also tailored and repeated as described in **Chapter 4** and **Chapter 5**.

6.12. Disposing of Test Assets. Test assets (e.g., instrumentation and test articles) from canceled or completed tests will be catalogued and turned over to government T&E organizations or acquisition or sustainment programs, or refurbished and reassigned to owning MAJCOMs. Surplus or unusable items will be sent to the nearest Defense Reutilization Management Office.

Chapter 7

TEST AND EVALUATION OVERSIGHT AND REPORTING

7.1. OSD T&E Oversight List. DOT&E and USD(AT&L)/DS jointly publish an annual list of acquisition and sustainment programs requiring OSD T&E Oversight and approval. All test organizations should forward recommended additions or deletions to the T&E Oversight List through HQ USAF/TEP to OSD. In addition, OSD places information technology programs with significant interoperability deficiencies and issues on an Interoperability Watch List where they may transition to the OSD T&E Oversight List. The Annual T&E Oversight List is at **http://www.dote.osd.mil**.

7.2. General Reporting Policy. Test reports must be timely, factual, concise, and tailored to the needs of decision makers. All T&E plans will describe which kinds of reports are required, their contents, and when and to whom they are submitted. All tests should conclude with reports containing evaluations of test results, conclusions, and recommendations. All reports must be properly archived and retrievable for future use. Reporting requirements for programs on OSD T&E Oversight are summarized in **Attachment 2**.

7.3. DT&E Reports. The types and frequency of DT&E reports will be tailored to meet decision makers' requirements as documented in the ITP and the TEMP. LFT&E reports must be submitted to DOT&E 45 days prior to the beyond LRIP decision review. The PM will document requirements for contractor test reports in the CDRL. Formal briefings are generally not required.

7.4. DT&E Report Distribution. The ITT will develop a distribution list for all DT&E reports which shall include operational testers, PTOs, applicable MAJCOMs, and the Defense Technical Information Center (DTIC). DT&E reports are not releasable to non-government agencies without prior approval and coordination of the PM. Release of contractor test reports may be subject to restrictions in the contract. For OSD T&E Oversight programs, the PEM will send a copy through appropriate channels to USD(AT&L)/DS and DOT&E if required. The PM will coordinate distribution of Signals Intelligence and Communications Security final reports with the National Security Agency, and provide copies to HQ AFIC/IMQF, San Antonio TX 78243-5000.

7.5. Operational Test Reports.

7.5.1. **Significant Test Event Reports.** These reports briefly describe the results of significant test events during operational test activities. Operational testers will submit these reports to the PM, HQ USAF/TE, PEM, PEO or Capability Director, RTO, PTOs, operational MAJCOM, among others, within 24 hours of any significant test event as described in the test plan.

7.5.2. **Interim Summary Reports.** Operational testers will provide an interim summary report when a final report cannot be completed 45 days before a decision review. They are done on a contingency basis only as needed. A formal briefing may also be required. Interim summary reports are especially important prior to FRP decisions.

7.5.3. **Final Reports.** All final reports are due not later than 60 days after the last dedicated test event. The reports must address each of the COIs, system operational effectiveness and suitability, and include an assessment of operational mission impacts. These reports must strike the proper balance between system capabilities versus limitations, while taking into account how well the system per-

formed mission essential tasks. When appropriate, a production or fielding recommendation is required for final IOT&E, QOT&E, FOT&E, OUE, and FDE reports. All Category I DRs and the top 10 Category II DRs will be listed. Detailed technical information should be published in separate data documents.

7.6. Operational Test Report Distribution. Operational testers will send reports to the MDA, PM, PEO or Capability Director, HQ USAF/TEP, RTO, PTOs, HQ AFMC/DO or HQ AFSPC/DR, operational MAJCOM(s), PEM, and DTIC as a minimum. For OSD OT&E Oversight programs, HQ USAF/TE will forward copies to DOT&E and USD(AT&L)/DS. A summary of operational test reporting requirements is in **Attachment 2**.

7.7. Electronic Warfare (EW) Programs. All EW programs on OSD T&E Oversight are required to annually report their progress in implementing the DoD T&E Process for EW Systems according to Public Law (P.L.) 103-160 §220(a). PMs and test organizations for these programs will provide T&E information to HQ USAF/TEP according to **Attachment 2**. HQ USAF/TEP will consolidate information in coordination with HQ USAF/XORE before submitting to USD(AT&L)/DS.

7.8. Integrated Test Reports. Integrated test reports (e.g., combined developmental and operational) are written and distributed according to ITT direction and tailored to decision makers' needs. The goals and results of each embedded test should be visible yet fully integrated into a total picture of system capabilities and mission impacts.

7.9. MOT&E Reports. The lead Service will prepare a single MOT&E report aggregating all OT&E information from the participating Services' inputs. Each participating Service has the option of preparing its own supplemental report as an attachment to the single MOT&E report. All significant differences between Service test results should be explained. This guidance also applies to testing with other DoD or Federal agencies. See the *Memorandum of Agreement on Multi-Service Operational Test and Evaluation (MOT&E)*. ***NOTE:*** Final MOT&E reports are required 90 days after the last MOT&E event.

7.10. "Briefing Trail." HQ USAF/TE will arrange for Air Force-level reviews of test report briefings. The other Services must be invited for multi-Service programs. The PM must be prepared to address technical questions, program issues, DT&E, and the resolution of deficiencies. Operators must attend to answer questions regarding operational requirements and mission impacts of fielding the system. Allow sufficient time between briefings to address questions and unforeseen issues.

7.11. Control of Test Reports. The reporting requirements in this AFI are exempt from licensing according to AFI 33-324, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information Collections*.

7.12. Distributing and Safeguarding Test Information.

7.12.1. **Within the DoD.** Test organization commanders determine release authority for reports and information under their control. Classified test information cannot be released except as specified in DoDD 5200.1, *DoD Information Security Program*, and associated documents.

7.12.2. **Outside the DoD.** Test directors do not have release authority for test information and communications outside DoD channels. Freedom of Information Act requests should be processed accord-

ing to DoD Regulation 5400.7/Air Force Supplement. Test information released to Congress, the General Accounting Office, the DoD Inspector General, or similar agencies must follow guidance in AFI 90-401, *Air Force Relations With Congress*, and AFI 65-401, *Relations With the General Accounting Office*. The Information Branch of the Office of the Vice Chief of Staff of the Air Force (HQ USAF/CVAII) will release test information to foreign nationals.

JOHN T. MANCLARK, Director
Test and Evaluation

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

Title 10, United States Code, *Armed Forces,* §139, §2366, §2399, §2400, §2350a(g)

Title 32, Code of Federal Regulations, Part 989, *Environmental Impact Analysis Process*

Public Law (P.L.) 103-160 §220, *National Defense Authorization Act for Fiscal Year 1994*

JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*

CJCSI 3170.01D*, Joint Capabilities Integration and Development System*

CJCSM 3170.01A, *Operation of the Joint Capabilities Integration and Development System*

CJCSI 6212.01C*, Interoperability and Supportability of Information Technology and National Security Systems*

DoDD 3200.11, *Major Range and Test Facility Base (MRTFB)*

DoDD 5000.1, *The Defense Acquisition System*

DoDI 5000.2, *Operation of the Defense Acquisition System*

DoDI S-3100.15, *Space Control*

DoDD 5141.2, *Director of Operational Test and Evaluation (DOT&E)*DoDD 5010.41, *Joint Test and Evaluation (JT&E) Program*

DoDD 5200.1, *DoD Information Security Program*

DoD 3235.1-H, *DoD Test and Evaluation of System Reliability, Availability and Maintainability A Primer*

DoDI 5200.40, *DoD Information Technology Security Certification and Accreditation Process (DITSCAP)*

DoD 7000.14-R, *Financial Management Regulation,* Vol 2A

DoDI 8500.2, *Information Assurance (IA) Implementation National Security Space(NSS) Acquisition Policy 03-01*

AFDD 1-2, *Air Force Glossary*

AFMD 14, *Air Force Operational Test and Evaluation Center (AFOTEC)*

AFPD 10-23, *Operational Innovation Program*

AFI 10-230, *Conduct of Key Exercises and Experiments*

AFI 10-400, *Aerospace Expeditionary Force Planning*

AFI 10-601, *Capabilities Based Requirements Development*

AFI 10-602, *Determining Mission Capability and Supportability Requirements*

AFI 10-1202, *Space Test Program (STP) Management*

AFI 10-2303, *Battlelabs*

AFI 11-260, *Tactics Development Program*

AFI 13-212, Vol I, *Range Planning and Operations*

AFI 14-206, *Modeling and Simulation*

AFPD 16-2*, Operations Support, Disclosure of Military Information to Foreign Governments and International Organizations*

AFI 16-301*, U.S. Air Force Priority System for Resources Management*

AFI 16-1001, *Verification, Validation and Accreditation (VV&A)*

AFI 16-1002*, Modeling and Simulation in Support to Acquisition*

AFI 33-324, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information Collections*

AFPD 37-1, *Information Management*

AFMAN 37-123, *Management of Records*

AFPAM 38-102, *Headquarters United States Air Force Organization and Functions (Chartbook)*

AFI 61-105, *Planning for Science and Technology*

AFI 61-204, *Disseminating Scientific and Technical Information*

AFPD 63-5, *Quality Assurance*

AFI 63-101*, Acquisition System,* to be replaced by AFI 63-101, *Operation of the Capabilities Based Acquisition System*, in Summer, 2004

AFI 63-104, *The SEEK EAGLE Program*

AFMAN 63-119, *Certification of System Readiness for Dedicated Operational Test and Evaluation*

AFI 63-501, *Air Force Acquisition Quality Program*

AFI 63-1101*, Modification Management*

AFI 63-1201, *Assurance of Operational Safety, Suitability, and Effectiveness*

AFI 65-401, *Relations With the General Accounting Office*

AFI 65-601, Vol 1, *Budget Guidance and Procedures*

AFI 90-401, *Air Force Relations With Congress*

AFI 91-202, *The US Air Force Mishap Prevention Program*

AFI 91-204*, Safety Investigations and Reports*

AFI 91-205, *Nonnuclear Munitions Safety Board*

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program*

AFPD 99-1, *Test and Evaluation Process*

AFMAN 99-104, *Armament-Munitions Test Process—Direction and Methodology for Testing*

AFI 99-106, *Joint Test and Evaluation Program*

AFI 99-108, *Programming and Reporting Missile and Target Expenditures in Test and Evaluation*

AFI 99-109, *Test Resource Planning*

AFMAN 99-110, *Air Frame-Propulsion-Avionics Test and Evaluation Process Manual*

AFMAN 99-111, *Command, Control, Communications, Computers, and Intelligence (C4I) Test and Evaluation Process*

AFMAN 99-112, *Electronic Warfare Test and Evaluation Process—Direction and Methodology for EW Testing*

AFMAN 99-113*, Space Systems Test and Evaluation Process Direction and Methodology for Space System Testing*

AFI 99-114, *Foreign Materiel Program (S)Single Acquisition Management Plan Guide*TO 00-35D-54, *USAF Deficiency Reporting and Investigation System*

TO 00-5-1*, Air Force Technical Order System*SD-2, *Buying Commercial & Nondevelopmental Items: A Handbook*, Apr 1996

The Foreign Comparative Testing (FCT) HandbookMemorandum of Agreement on Multi-Service Operational Test and Evaluation (MOT&E)Defense Acquisition Guidebook International Armament Cooperation Handbook Test and Evaluation Management Guide, Defense Acquisition University Press, 4th edition*Glossary, Defense Acquisition Acronyms and Terms*

Abbreviations and Acronyms

ACAT—Acquisition Category

ACTD—Advanced Concept Technology Demonstration

ADM—Acquisition Decision Memorandum

AFAMS—Air Force Agency for Modeling and Simulation

AFC2ISRC—Air Force Command and Control & Intelligence, Surveillance, and Reconnaissance Center

AFDD—Air Force Doctrine Document

AFFTC—Air Force Flight Test Center

AFI—Air Force Instruction

AFIWC—Air Force Information Warfare Center

AFMAN—Air Force Manual

AFMC—Air Force Materiel Command

AFMD—Air Force Mission Directive

AFMSRR—Air Force Modeling and Simulation Resource Repository

AFOSH—Air Force Occupational and Environmental Safety, Fire Protection and Health

AFOTEC—Air Force Operational Test and Evaluation Center

AFPAM—Air Force Pamphlet

AFPD—Air Force Policy Directive

AFROCC—Air Force Requirements for Operational Capabilities Council

AFSPC—Air Force Space Command

ALC—Air Logistics Center

Ao—Availability

AoA—Analysis of Alternatives

APDP—Acquisition Professional Development Program

ATD—Advanced Technology Demonstration

ATEC—Army Test and Evaluation Command

BI—Battlelab Initiative

C2—Command and Control

C4I—Command, Control, Communications, Computers, and Intelligence

CAE—Component Acquisition Executive

CDD—Capability Development Document

CDRL—Contract Data Requirements List

CJCSI—Chairman of the Joint Chiefs of Staff Instruction

CJCSM—Chairman of the Joint Chiefs of Staff Manual

COA—Course of Action

COI—Critical Operational Issue

COTS—Commercial-Off-The-Shelf

CPD—Capability Production Document

CSAF—Chief of Staff of the Air Force

CTF—Combined Test Force

CTP—Critical Technical Parameter

DAB—Defense Acquisition Board

DAU—Defense Acquisition University

DoD—Department of Defense

DoDD—Department of Defense Directive

DoDI—Department of Defense Instruction

DOT&E—Director, Operational Test and Evaluation

DR—Deficiency Report or Deficiency Reporting

DRR—Design Readiness Review

DSM—Digital System Model

DTIC—Defense Technical Information Center

DT&E—Developmental Test and Evaluation

EA—Evolutionary Acquisition

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EOA—Early Operational Assessment

EW—Electronic Warfare

FAT—First Article Test

FCT—Foreign Comparative Testing

FDE—Force Development Evaluation

FOA—Field Operating Agency

FOC—Full Operational Capability

FOT&E—Follow-on Operational Test and Evaluation

FRP—Full-Rate Production

FSA—Functional Solution Analysis

GFE—Government Furnished Equipment

HPT—High Performance Team

HQ—Headquarters

IA—Information Assurance

ICD—Initial Capabilities Document

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IITD—Initial Integrated Test Design

IO—Information Operations

IOC—Initial Operational Capability

IOT&E—Initial Operational Test and Evaluation

IPS—Integrated Program Summary

ISP—Information Support Plan

ISR—Intelligence, Surveillance, and Reconnaissance

IT—Information Technology

ITC—Integrated Test Concept

ITP—Integrated Test Plan

ITT—Integrated Test Team

JITC—Joint Interoperability Test Command

JP—Joint Publication

JRMET—Joint Reliability and Maintainability Evaluation Team

JROC—Joint Requirements Oversight Council

JT&E—Joint Test and Evaluation

KDP—Key Decision Point

LAT—Lot Acceptance Test

LFT&E—Live Fire Test and Evaluation

LRIP—Low-Rate Initial Production

M&S—Modeling and Simulation

MAJCOM—Major Command

MCOTEA—Marine Corps Operational Test and Evaluation Agency

MDA—Milestone Decision Authority

MDAP—Major Defense Acquisition Program

MOA—Memorandum of Agreement

MOE—Measure of Effectiveness

MOP—Measure of Performance

MOT&E—Multi-Service Operational Test and Evaluation

MRTFB—Major Range and Test Facility Base

MS—Milestone

NDI—Non-Developmental Item

NNMSB—Nonnuclear Munitions Safety Board

NSS—National Security System *or* National Security Space

OA—Operational Assessment

OPR—Office of Primary Responsibility

OPTEVFOR—Operational Test and Evaluation Force

OSD—Office of the Secretary of Defense

OT&E—Operational Test and Evaluation

OTA—Operational Test Agency

OUE—Operational Utility Evaluation

PAT&E—Production Acceptance Test and Evaluation

PEM—Program Element Monitor

PEO—Program Executive Officer

P.L.—Public Law

PM—Program Manager

PMD—Program Management Directive

POC—Point of Contact

POM—Program Objective Memorandum

PPQT—Pre-Production Qualification Test

PQT—Production Qualification Test

PTO—Participating Test Organization

QOT&E—Qualification Operational Test and Evaluation

QT&E—Qualification Test and Evaluation

R&D—Research and Development

RDT&E—Research, Development, Test, and Evaluation

RFP—Request for Proposal

RM&A—Reliability, Maintainability, and Availability

RTO—Responsible Test Organization

SAMP—Single Acquisition Management Plan

SDD—System Development and Demonstration

SECDEF—Secretary of Defense

SOW—Statement of Work

SPO—System Program Office

SRB—Safety Review Board

SRD—System Requirements Document

T&E—Test and Evaluation

TD&E—Tactics Development and Evaluation

TDS—Technology Development Strategy

TDSB—Test Data Scoring Board

TEMP—Test and Evaluation Master Plan

TIPT—Test Integrated Product Team

TO—Technical Order

TPWG—Test Planning Working Group (discontinued)

TRB—Technical Review Board

TRP—Test Resource Plan

TTP—Tactics, Techniques, and Procedures

TW—Test Wing

U.S.—United States

USAF—United States Air Force

VV&A—Verification, Validation, and Accreditation

WSEP—Weapon System Evaluation Program

www—World Wide Web

Terms

NOTE: See AFI 10-601 and AFI 63-101 for definitions of terms relating to the requirements and acquisition processes. ***NOTE:*** A common understanding of terms is essential to effectively implement this instruction. In some cases, definitions from multiple sources are offered where they may be of value. Italicized words and notes in brackets are not part of the formal definition and are offered only for clarity. ***NOTE:*** For additional terms and definitions not listed below, see Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*, and Air Force Doctrine Document (AFDD) 1-2, *Air Force Glossary,* which contain standardized terms and definitions for DoD and Air Force use. An unofficial source is the *Test and Evaluation Management Guide,* 4th edition, Defense Acquisition University (DAU) Press.

Acquisition Category (ACAT)—Acquisition categories determine the level of review, decision authority, and applicable T&E policies and procedures. They facilitate decentralized decision making and execution, and compliance with statutorily imposed requirements. See DoDI 5000.2, Enclosure 2 for details.

Advanced Concept Technology Demonstration—A demonstration of the military utility of a significant new technology and an assessment to clearly establish operational utility and system integrity. (CJCSI 3170.01D)

Availability (Ao)—A measure of the degree to which an item is in the operable and committable state at the start of a mission when the mission is called for at an unknown (random) time. (*Defense Acquisition Guidebook*)

Capability Based Testing—A mission-focused methodology of verifying that a capabilities solution will enable operations at an acceptable level of risk. Capabilities-oriented evaluations are emphasized throughout system testing in addition to traditional evaluations of system performance measured against specification-like requirements. It requires understanding Concept of Operations and involves developing T&E strategies and plans to determine whether a capability solution option merits fielding.

Combined Testing—See Integrated Testing.

Covered System—1. A vehicle, weapon platform, or conventional weapon system that includes features designed to provide some degree of protection to users in combat; and this is a major system within the meaning of that term in Title 10 §2302(5). (Title 10 §2366). **2.** All categories of systems or programs

identified in Title 10 §2366 as requiring live fire test and evaluation. In addition, non-traditional systems or programs that do not have acquisition points referenced in Title 10 §2366, but otherwise meet the statutory criteria. ***NOTE*:** The definitions of "covered system," "major munitions program," and "covered product improvement program" are encompassed in the single DoD term "covered system." (*Defense Acquisition Guidebook*, Appendix 3, which includes conventional munitions programs for which more than 1,000,000 rounds are planned to be acquired; or a modification to a covered system that is likely to affect significantly the survivability or lethality of such a system.)

Covered Product Improvement Program—See Covered System.

Critical Operational Issue (COI)— 1. Operational effectiveness and operational suitability issues (not parameters, objectives, or thresholds) that must be examined during operational testing to determine the system's capability to perform its mission. (paraphrased from DAU's *Test and Evaluation Management Guide)* **2.** A key question that must be examined in operational test and evaluation to determine the system's capability to perform its mission. Testers normally phrase a COI as a question to be answered in evaluating a system's operational effectiveness or suitability.

Critical Technical Parameter (CTP)—Measurable critical system characteristics that, when achieved, allow the attainment of operational performance requirements. They are technical measures derived from operator requirements. Failure to achieve a critical technical parameter should be considered a reliable indicator that the system is behind in the planned development schedule or will likely not achieve an operational requirement. (paraphrased from *Defense Acquisition Guidebook***)**

Dedicated Operational Testing—Operational test and evaluation that is conducted independently from contractors, developers, and operators and used to support production or fielding decisions.

Deficiency Report (DR)—The report used to identify, document, and track system deficiency or enhancement data while a system is in advanced development, operational test, or operational transition.

—**Category I** DRs are those that could cause death, severe injury, severe occupational illness, major loss or damage, or directly restrict combat or operational readiness if left uncorrected.

—**Category II** DRs are those that do not meet the criteria of a Cat I DR. They are attributable to errors in workmanship, nonconformance to specifications, drawing standards, or other technical requirements; or identify a problem for potential improvement or enhancement.

—**Enhancements** are a type of Category II DR that identifies conditions that complement, but are not absolutely required for successful mission accomplishment. The recommended condition, if incorporated, will improve a system's operational effectiveness or suitability. (paraphrased from TO 00-35D-54)

Deployment 1.—The movement of forces within operational areas. **2.** The relocation of forces and materiel to desired operational areas. Deployment encompasses all activities from origin or home station through destination. (JP 1-02)

Developmental Test and Evaluation (DT&E)—Test and evaluation conducted to evaluate design approaches, validate analytical models, quantify contract technical performance and manufacturing quality, measure progress in system engineering design and development, minimize design risks, predict integrated system operational performance (effectiveness and suitability) in the intended environment, and identify system problems (or deficiencies) to allow for early and timely resolution. DT&E includes contractor testing and is conducted over the life of the system to support acquisition and sustainment efforts. (*Defense Acquisition Guidebook*)

Early Operational Assessment (EOA)—An operational assessment (OA) conducted before MS B. An EOA assesses the design approach sufficiently early in the acquisition process to assure it has the potential to fulfill operator requirements. See Operational Assessment.

Evaluation Criteria—Standards by which the accomplishment of required technical and operational effectiveness and/or suitability characteristics, or resolution of operational issues, may be addressed. (*Defense Acquisition Guidebook*)

Evolutionary Acquisition—Evolutionary acquisition is the preferred DoD strategy for rapid acquisition of mature technology for the user. An evolutionary approach delivers capability in increments, recognizing, up front, the need for future capability improvements. The objective is to balance needs and available capability with resources, and to put capability into the hands of the user quickly. The success of the strategy depends on consistent and continuous definition of requirements, and the maturation of technologies that lead to disciplined development and production of systems that provide increasing capability towards a materiel concept. The approaches to achieve evolutionary acquisition require close collaboration between the user, tester, and developer. (DoDI 5000.2) They include:

Spiral Development—In this process, a desired capability is identified, but the end-state requirements are not known at program initiation. Those requirements are refined through demonstration and risk management; there is continuous user feedback; and each increment provides the user the best possible capability. The requirements for future increments depend on feedback from users and technology maturation. (DoDI 5000.2)

Incremental Development—In this process, a desired capability is identified, an end-state requirement is known, and that requirement is met over time by developing several increments, each dependent on available mature technology. (DoDI 5000.2)

Fielding—The decision to acquire and/or release a system to operators in the field.

First Article Test (FAT)—Production testing that is planned, conducted, and monitored by the materiel developer. FAT includes pre-production and initial production testing conducted to ensure that the contractor can furnish a product that meets the established technical criteria. (DAU's *Test and Evaluation Management Guide*)

Follow-on Operational Test and Evaluations (FOT&E)—The continuation of IOT&E or QOT&E activities past the full-rate production decision. FOT&E answers specific questions about unresolved COIs or completes areas not finished during the IOT&E or QOT&E. It ensures the initial system acquisition process is complete.

Force Development Evaluation (FDE)—The operational test and evaluation of fielded, operational systems during the sustainment portion of the system life cycle after acceptance for operational use. The focus is on maintaining or upgrading operational systems after the initial acquisition process is complete. An FDE also supports acquisition of MAJCOM-managed systems.

Foreign Comparative Test (FCT)—A T&E program centrally managed by OSD which provides funding for U.S. T&E of selected equipment items and technologies developed by allied or friendly countries when such items or technologies are identified as having good potential to satisfy valid DoD requirements. (DoD 5000.3-M-2)

Full-Up, System-Level Testing—Testing that fully satisfies the statutory requirement for "realistic survivability testing" or "realistic lethality testing" as defined in Title 10 §2366. (*Defense Acquisition Guidebook*, Appendix 3)

Increment—A militarily useful and supportable operational capability that can be effectively developed, produced or acquired, deployed, and sustained. Each increment of capability will have its own set of threshold and objective values set by the user. (CJCSI 3170.01D and AFI 10-601) ***NOTE***: An increment

may contain multiple spirals. Generally, only increments are fielded according to DoDI 5000.2, CJCSI 3170.01D, and AFI 63-101.

Information Support Plan (ISP)—[The plan] used by program authorities to document the IT and NSS needs, objectives, interface requirements for all non-ACAT and fielded programs. (CJCSI 6212.01C)

Initial Operational Test and Evaluation (IOT&E)—See Operational Test and Evaluation.

Integrated Testing—Any combination of two or more types of testing used to achieve greater test efficiency, reduced cost, and schedule savings without compromising the objectives and needs of the participating test organizations.

Integrated Test Team (ITT)—A cross-functional team of empowered representatives from multiple disciplines and organizations and co-chaired by operational testers and the program manager. The ITT is responsible for developing the T&E strategy and TEMP, assisting the acquisition community with T&E matters, and guiding the development of integrated test plans. There is one ITT for each acquisition program.

Joint Test and Evaluation (JT&E)—An OSD-sponsored T&E program conducted among more than one military Service to provide T&E information on combat operations issues and concepts. JT&E does not support system acquisition. (DoDD 5010.41)

Lethality—The capability of a munition or directed energy weapon to cause damage that will cause the loss or a degradation in the ability of a target system to complete its designated mission(s). (*Defense Acquisition Guidebook*, Appendix 3)

Live Fire Test and Evaluation (LFT&E)—The firing of actual weapons (or surrogates if actual weapons are not available) at components, subsystems, sub-assemblies, and/or full-up, system-level targets or systems to examine personnel casualties, system vulnerabilities, or system lethality; and the evaluation of the results of such testing. (*Defense Acquisition Guidebook*, Appendix 3)

Logistics Support Elements —1. A composite of all support considerations necessary to ensure the effective and economical support of a system for its life cycle. It is an integral part of all other aspects of system acquisition and operation. (JP 1-02) ***NOTE:*** The ten logistics support elements are: maintenance planning; manpower and personnel; supply support; support equipment; technical data; training and training support; computer resources support; facilities; packaging, handling, storage, and transportation; and design interface. Formerly known as Integrated Logistics Support. (AFI 10-602)

Logistics Supportability—The degree to which the planned logistics support allows the system to meet its availability and wartime usage requirements. Planned logistics support includes the following: test, measurement, and diagnostic equipment; spare and repair parts; technical data; support facilities; transportation requirements; training; manpower; and software. (*Defense Acquisition Guidebook*)

Logistics Test and Evaluation—The test methodology, criteria, and tools for evaluating and analyzing the ten logistics support elements as they apply to a system under test. The objective is to influence the design through applying the logistics support elements as early as possible in the acquisition cycle. This testing integrates the evaluation and analysis efforts of RM&A, human factors engineering, and logistics test, and is an integral part of the DT&E report.

Lot Acceptance Test (LAT)—A test based on a sampling procedure to ensure that the product retains its quality. No acceptance or installation should be permitted until this test for the lot has been successfully completed. (*Glossary, Defense Acquisition Acronyms and Terms*, and DAU's *Test and Evaluation Management Guide*)

Low-Rate Initial Production (LRIP)—Production of the system in the minimum quantity necessary (1) to provide production-configured or representative articles for operational tests pursuant to §2399; (2) to establish an initial production base for the system; and (3) to permit an orderly increase in the production rate for the system sufficient to lead to full-rate production upon the successful completion of operational testing. ***NOTE:*** The LRIP quantity should not exceed 10 percent of the total number of articles to be produced as determined at the milestone B decision. (Title 10 §2400)

Maintainability—The capability of an item to be retained in or restored to a specified condition when maintenance is performed by personnel having specified skill levels, using prescribed procedures and routines, at each prescribed level of maintenance and repair. (*Defense Acquisition Guidebook*)

Major Munitions Program—See Covered System.

Measurable—Having qualitative or quantitative attributes (e.g., dimensions, velocity, capabilities) that can be ascertained and compared to known standards. (See Testable.)

Measure of Effectiveness (MOE)—A qualitative or quantitative measure of a system's performance or a characteristic that indicates the degree to which it performs the task or meets a requirement under specified conditions. MOEs should be established to measure the system's capability to produce or accomplish the desired result.

Measure of Performance—A quantitative measure of a system's capability to accomplish a task. Typically in the area of physical performance (e.g., range, velocity, throughput, payload).

Military Utility—The military worth of a system performing its mission in a competitive environment including versatility (or potential) of the system. It is measured against the operational concept, operational effectiveness, safety, security, and cost/worth. Military utility estimates form a rational basis for making management decisions. (*Glossary, Defense Acquisition Acronyms and Terms*)

Multi-Service—Involving two or more military Services or DoD components.

Multi-Service Operational Test and Evaluation (MOT&E)—OT&E conducted by two or more Service OTAs for systems acquired by more than one Service. MOT&E is conducted according to the T&E directives of the lead OTA, or as agreed in a memorandum of agreement between the participants.

Objective—An operationally significant increment above the threshold. An objective value may be the same as the threshold when an operationally significant increment above the threshold is not significant or useful. (AFI 10-601)

Operational Assessment (OA)—An analysis of potential operational effectiveness and suitability made by an independent operational test activity, with operator support as required, on other than production systems. The focus of an operational assessment is on significant trends noted in development efforts, programmatic voids, areas of risk, adequacy of requirements, and the ability of the program to support adequate operational testing. Operational assessments may be made at any time using technology demonstrators, prototypes, mockups, engineering development models, or simulations, but will not substitute for the dedicated OT&E [sic] necessary to support full production decisions. (*Defense Acquisition Guidebook*)

Operational Effectiveness—Measure of the overall ability to accomplish a mission when used by representative personnel in the environment planned or expected for operational employment of the system considering organization, doctrine, tactics, supportability, survivability, vulnerability and threat. (CJCSI 3170.01D)

Operational Suitability—The degree to which a system can be placed and sustained satisfactorily in field use with consideration given to availability, compatibility, transportability, interoperability, reliability, wartime usage rates, maintainability, safety, human factors, habitability, manpower,logistics, supportability, logistics supportability, natural environmental effects and impacts, documentation, and training requirements. (CJCSI 3170.01D)

Operational Test Agency (OTA)—An independent agency reporting directly to the Service Chief that plans and conducts operational tests, reports results, and provides evaluations of effectiveness and suitability on new systems. (DoDD 5000.1) ***NOTE***: Each Service has one designated OTA: The Air Force has the Air Force Operational Test and Evaluation Center (AFOTEC). The Navy has the Operational Test and Evaluation Force (OPTEVFOR). The Army has the Army Test and Evaluation Command (ATEC). The Marine Corps has the Marine Corps Operational Test and Evaluation Agency (MCOTEA).

Operational Test and Evaluation (OT&E)— 1. The field test, under realistic combat conditions, of any item of (or key component of) weapons, equipment, or munitions for the purpose of determining the effectiveness and suitability of the weapons, equipment, or munitions for use in combat by typical military users; and the evaluation of the results of such test. (Title 10 §139(a)(2)) **2.** Testing and evaluation conducted in as realistic an operational environment as possible to estimate the prospective system's operational effectiveness and operational suitability. In addition, OT&E provides information on organization, personnel requirements, doctrine, and tactics. It may also provide data to support or verify material in operating instructions, publications, and handbooks.

Operational Testing—A generic term describing the test and evaluation options and levels of effort available to an operational test organization.

Operational Utility Evaluation (OUE)—OUEs are evaluations of military capabilities conducted to demonstrate or validate new operational concepts or capabilities, upgrade components, or expand the mission or capabilities of existing or modified systems. .

Operator—Refers to the operating command which is the primary command operating a system, subsystem, or item of equipment. Generally applies to those operational commands or organizations designated by Headquarters, US Air Force to conduct or participate in operations or operational testing, interchangeable with the term "using command" or “user.” In other forums the term “warfighter” or “customer” is often used. (AFI 10-601)

Oversight—Senior executive-level monitoring and review of programs to ensure compliance with policy and attainment of broad program goals.

Oversight Program—A program on the OSD T&E Oversight List for DT&E, LFT&E, and/or OT&E. The list includes all ACAT I (MDAP) programs, ACAT II (major system) programs, and any other programs selected for OSD T&E Oversight. These programs require additional documentation and have additional review, reporting, and approval requirements.

Participating Test Organization (PTO)—Any test organization required to support a lead test organization by providing specific T&E data or resources for a T&E program or activity.

Pre-Production Qualification Test (PPQT)—The formal contractual tests that ensure design integrity over the specified operational and environmental range. These tests usually use prototype or pre-production hardware fabricated to the proposed production design specifications and drawings. Such tests include contractual reliability and maintainability demonstration tests required prior to production release. (*Glossary, Defense Acquisition Acronyms and Terms*, and DAU's *Test and Evaluation Management Guide*)

Production Acceptance Test and Evaluation (PAT&E)—Test and evaluation of production items to demonstrate that items procured fulfill requirements and specifications of the procuring contract or agreements. (DAU's *Test and Evaluation Management Guide*)

Production Qualification Test (PQT)—A technical test conducted prior to the full rate production decision to ensure the effectiveness of the manufacturing processes, equipment, and procedures. [ ] These tests are conducted on a number of samples taken at random from the first production lot, and are repeated if the manufacturing process or design is changed significantly, or when a second source is brought on line. (*Glossary, Defense Acquisition Acronyms and Terms*, and DAU's *Test and Evaluation Management Guid*e)

Program Manager (PM) —1. The designated individual with responsibility for and authority to accomplish program objectives for development, production, and sustainment to meet the user's operational needs. The PM shall be accountable for credible cost, schedule, and performance reporting to the MDA. (DoDD 5000.1) **2**. Applies collectively to system program directors, product group managers, single managers, acquisition program managers, and weapon system managers. Operating as the single manager, the PM has total life cycle system management authority. ***NOTE***: This AFI uses the term "PM" for any designated person in charge of acquisition activities prior to MS A (i.e., before a technology project is officially designated an acquisition program).

Prototype 1.—A model suitable for evaluation of design, performance, and production potential. (JP 1-02) ***NOTE:*** The Air Force uses prototypes during development of a technology or acquisition program for verification or demonstration of technical feasibility. Prototypes may not be representative of the final production item.

Qualification Operational Test and Evaluation (QOT&E)—A tailored type of IOT&E performed on systems for which there is little to no RDT&E-funded development effort. Commercial-off-the-shelf (COTS), non-developmental items (NDI), and government furnished equipment (GFE) are tested in this manner.

Qualification Test and Evaluation (QT&E)—A tailored type of DT&E for which there is little to no RDT&E-funded development effort. Commercial-off-the-shelf (COTS), non-developmental items (NDI), and government furnished equipment (GFE) are tested in this manner.

Recoverability—Following combat damage, the ability to take emergency action to prevent loss of the system, to reduce personnel casualties, or to regain weapon system combat mission capabilities. (*Defense Acquisition Guidebook*, Appendix 3)

Reliability—The capability of a system and its parts to perform its mission without failure, degradation, or demand on the support system. (*Defense Acquisition Guidebook*)

Research, Development, Test and Evaluation (RDT&E)—The type of funding appropriation (3600) intended for research, development, test and evaluation efforts. (DoD 7000.14-R, Vol 2A, and AFI 65-601, Vol I) ***NOTE:*** The term "research and development" (R&D) broadly covers the work performed

by a government agency or the private sector. “Research” is the systematic study directed toward gaining scientific knowledge or understanding of a subject area. “Development” is the systematic use of the knowledge and understanding gained from research for the production of useful materials, devices, systems, or methods. RDT&E includes all supporting test and evaluation activities.

Responsible Test Organization (RTO)—The lead government developmental test organization on the ITT that is qualified to conduct and responsible for overseeing DT&E.

Risk—1. A measurable probability of consequence associated with a set of conditions or actions. (*Glossary, Defense Acquisition Acronyms and Terms*) **2.** Probability and severity of loss linked to hazards. (JP 1-02) **3**. A subjective assessment made regarding the likelihood or probability of not achieving a specific objective by the time established with the resources provided or requested. It also refers to overall program risk. (*Defense Acquisition Guidebook*)

Seamless Verification—A concept for structuring test and evaluation (T&E) to more effectively support the requirements and acquisition processes so new capabilities are brought to operators more quickly. Seamless verification promotes using integrated testing procedures coupled with tester collaboration in early requirements definition and system development activities. It shifts T&E away from the traditional "pass-fail" model to one of providing continuous feedback and objective evaluations of system capabilities and limitations throughout system development.

Specification—A document intended primarily for use in procurement which clearly and accurately describes the essential technical requirements for items, materials, or services, including the procedures by which it will be determined that the requirements have been met. Specifications may be prepared to cover a group of products, services, or materials, or a single product, service, or material, and are general or detail specifications. (*Glossary, Defense Acquisition Acronyms and Terms*)

Spiral—One subset or iteration of a development program within an increment. Multiple spirals may overlap or occur sequentially within an increment. ***NOTE***: Generally, spirals are not fielded according to DoDI 5000.2, CJCSI 3170.01D, and AFI 63-101.

Survivability—The capability of a system and crew to avoid or withstand a man-made hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission. Survivability consists of susceptibility, vulnerability, and recoverability. (*Defense Acquisition Guidebook*, Appendix 3)

Susceptibility—The degree to which a weapon system is open to effective attack due to one or more inherent weaknesses. (Susceptibility is a function of operational tactics, countermeasures, probability of enemy fielding a threat, etc.) Susceptibility is considered a subset of survivability. (*Defense Acquisition Guidebook*, Appendix 3)

Sustainment— 1. The provision of personnel, logistic, and other support required to maintain and prolong operations or combat until successful accomplishment or revision of the mission or of the national objective. (JP 1-02) **2.** The Service's ability to maintain operations once forces are engaged. (AFDD 1-2) **3.** Activities that sustain systems during the operations and support phases of the system life cycle. Such activities include any investigative test and evaluation that extends the useful military life of systems, or expands the current performance envelope or capabilities of fielded systems. Sustainment activities also include T&E for modifications and upgrade programs, and may disclose system or product deficiencies and enhancements that make further acquisitions necessary.

Tactics Development and Evaluation (TD&E)—TD&E is a tailored type of FDE specifically designed to further exploit doctrine, system capabilities, tactics, techniques, and procedures during the sustainment portion of the system life cycle. TD&Es normally identify non-materiel solutions to tactical problems or evaluate better ways to use new or existing systems.

Testable—The attribute of being measurable with available test instrumentation and resources. ***NOTE:*** Testability is a broader concept indicating whether T&E infrastructure capabilities are available and capable of ***measuring*** the parameter. The difference between testable and measurable may indicate a test limitation. Some requirements may be ***measurable*** but not ***testable*** due to T&E infrastructure shortfalls, insufficient funding, safety, or statutory or regulatory prohibitions.

Test and Evaluation (T&E)—The act of generating empirical data during the research, development or sustainment of systems, and the creation of information through analysis that is useful to technical personnel and decision makers for reducing design and acquisition risks. The process by which systems are measured against requirements and specifications, and the results analyzed so as to gauge progress and provide feedback.

Test and Evaluation Master Plan (TEMP)—Documents the overall structure and objectives of the T&E program. It provides a framework within which to generate detailed T&E plans and it documents schedule and resource implications associated with the T&E program. The TEMP identifies the necessary developmental, operational, and live-fire test activities. It relates program schedule, test management strategy and structure, and required resources to: COIs; critical technical parameters; objectives and thresholds documented in the requirements document; and milestone decision points. (DAU's *Test and Evaluation Management Guide) NOTE*: Where the word "TEMP" appears in this AFI, the SAMP T&E annex is also implied. The TEMP may be included in a SAMP as a T&E annex.

Test and Evaluation Organization—Any organization whose designated mission includes test and evaluation.

Test and Evaluation Strategy—The overarching integrated T&E plan for the entire acquisition program that describes how operational capability requirements will be tested and evaluated in support of the acquisition strategy. Developed prior to Milestone A, the T&E strategy addresses modeling and simulation, risk and risk mitigation, development of support equipment, and identifies how system concepts will be evaluated against mission requirements, among other things. The T&E strategy is a precursor to the test and evaluation master plan.

Test Deferral—The delay of testing and/or evaluation of a specific critical technical parameter, operational requirement, or critical operational issue to a follow-on increment.

Test Integrated Product Team (TIPT)—Any temporary group consisting of testers and other experts who are focused on a specific test issue or problem. There may be multiple TIPTs for each acquisition program.

Test Limitation—Any condition that hampers but does not preclude adequate test and/or evaluation of a critical technical parameter, operational requirement, or critical operational issue during a T&E program.

Test Team—A group of testers and other experts who carry out integrated testing according to a specific test plan. ***NOTE***: A combined test force (CTF) is one way to organize a test team for integrated testing.

Threshold—A minimum acceptable operational value below which the utility of the system becomes questionable.

User—See Operator.

Verification, Validation and Accreditation (VV&A)—VV&A is a continuous process in the life cycle of a model or simulation as it gets upgraded or is used for different applications. (AFI 16-1002)

—***Verification:*** Process of determining that M&S accurately represent the developer's conceptual description and specifications.

—***Validation:*** Rigorous and structured process of determining the extent to which M&S accurately represents the intended "real world" phenomena from the perspective of the intended M&S use.

—***Accreditation:*** The official determination that a model or simulation is acceptable for use for a specific purpose.

Vulnerability—The characteristic of a system that causes it to suffer a definite degradation (loss or reduction of capability to perform its designated mission) as a result of having been subjected to a certain (defined) level of effects in an unnatural (man-made) hostile environment. Vulnerability is considered a subset of survivability. (*Defense Acquisition Guidebook*, Appendix 3)

Waiver—A decision not to conduct OT&E required by statute or policy.

Attachment 2

INFORMATION REQUIREMENTS FOR OSD T&E OVERSIGHT PROGRAMS

A2.1. Space acquisition programs exempted from compliance with the DoD 5000-series must consult *NSS 03-01* for modified reporting information.

Table A2.1. Information Requirements for OSD T&E Oversight Programs.

Item of Information	HQ USAF OPRs	Due to OSD[2, 3]	Comments
TEMPs and SAMPs[1] a. Draft TEMP or SAMP b. Service-approved TEMP or SAMP c. Newly-designated TEMP or SAMP	OPR: PEM OCR: AF/TEP	a. 90 days prior to milestone b. 45 days prior to milestone c. 90 days after program designation for OSD T&E Oversight	OSD (USD(AT&L) and DOT&E approval required prior to milestones and major decision reviews. Updates required for significant changes.
T&E Strategy	OPR: PEM OCR: AF/TEP	MS A	DOT&E approval required. Not required for programs starting at MS B.
LFT&E Waiver and Alternate LFT&E Plan (if required)	OPR: PEM OCR: AF/TEP	Due to DOT&E prior to MS B	DOT&E sends notification to Congress prior to MS B.
IOT&E, QOT&E, FOT&E , or OA Test Concept Briefings	AF/TEP	a. IOT&E, QOT&E or FOT&E briefings 120 days prior to test start **if required by DOT&E.** b. OA briefings should be provided a minimum of 30 days prior to test start.	a. Requirement stated in *Defense Acquisition Guidebook*. b. Requirement **not** stated in *Defense Acquisition Guidebook*.
OA, IOT&E, QOT&E, or FOT&E Test Plan Briefings	AF/TEP	Briefing required 60 days prior to test start at DOT&E request.	Requirement **not** stated in *Defense Acquisition Guidebook*.
OA, IOT&E, QOT&E, or FOT&E Plans (Service-approved)	AF/TEP	a. Required 60 days prior to start of IOT&E, QOT&E, or FOT&E. b. No minimum requirement for OA plans.	DOT&E written approval required before OA, IOT&E, QOT&E, or FOT&E may start. Report major revisions to DOT&E. Requirements stated in *Defense Acquisition Guidebook*.
FDE Plan (Service Approved)	AF/TEP	60 days prior to start of designated FDEs.[4]	DOT&E will direct approval prior to start of selected programs.
Significant Test Event Reports	a. PEM for DT&E b. AF/TEP for OT&E	24 hours after event	Events and addressees as listed in TEMP or SAMP and test plans.
OA, IOT&E, QOT&E, and FOT&E Final Reports	AF/TEP	60 days after end of last test event and 90 days for multi-Service tests.	A single report is required for multi-Service programs.
LFT&E Report	OPR: PEM OCR: AF/TEP	45 days prior to FRP review.	Due to DOT&E.

Item of Information	HQ USAF OPRs	Due to OSD[2, 3]	Comments
FDE Briefings and Final Reports	AF/TEP	Same as for OT&E final reports	Same as for OT&E final reports
Synopsis Report of EW Programs	AF/TEP	Due annually by 15 Nov to USD(AT&L)/DS	Congressionally required.[5]

NOTES:

1. Only the T&E portions of SAMPs require AFOTEC/CC and HQ USAF/TE coordination, and USD(AT&L)/DS and DOT&E approval.
2. All days are "calendar" days. Time periods and dates are "Not Later Than" due dates to OSD.
3. Due dates to HQ USAF are not later than 30 days prior to OSD due dates and decision reviews.
4. Only for programs on OSD OT&E Oversight.
5. Required by P.L. 103-160 §220(a).