Army Regulation 73–1

Test and Evaluation

Test and Evaluation Policy

Headquarters
Department of the Army
Washington, DC
8 June 2018

UNCLASSIFIED

SUMMARY of CHANGE

AR 73–1
Test and Evaluation Policy

This administrative revision, dated 25 July 2024—

- Changes proponency from the Deputy Under Secretary of the Army to the Assistant Secretary of the Army (Acquisition, Logistics and Technology) (title page).

This mandated revision, dated 8 June 2018—

- Incorporates Army Directive 2017–30, Acquisition Reform Initiative #4: Streamlining Test and Evaluation and Minimizing Redundant Testing, dated 15 November 2017, which requires changes to the Army Test and Evaluation Command System Evaluation Plan and Army Test and Evaluation Command briefing requirements to the Army Requirements Oversight Council and Army Systems Acquisition Review Council (paras 2–18*dd* through 2–18*gg*, 10–3*a*, 10–6, 10–8 (intro para), and 10–17*d*.)

- Incorporates Army Directive 2017–22, Implementation of Acquisition Reform Initiatives 1 and 2, dated 12 September 2017, which requires Army Test and Evaluation Command lead system evaluator credentials (para B–6*e*.)

- Adds definitions “data dictionary, data methods, and database structure” (glossary, section II).

Headquarters
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8 June 2018

*Army Regulation 73–1

Effective 8 June 2018

Test and Evaluation

Test and Evaluation Policy

By Order of the Secretary of the Army:

MARK A. MILLEY
General, United States Army
Chief of Staff

Official:

GERALD B. O'KEEFE
Administrative Assistant to the Secretary of the Army

History. This publication is an administrative revision. The portions affected by this administrative revision are listed in the summary of change.

Summary. This regulation implements the test and evaluation policies and procedures contained within DoDD 3200.11, DoDD 5000.01, DoDI 5000.02, DoDI 5134.17, and AR 70–1, and specifically prescribes implementing policies for the Army's testing and evaluation program. It applies to all systems acquired under the auspices of the AR 70–series. This regulation implements test and evaluation policy in support of accelerated/rapid acquisition initiatives, capabilities development for rapid transition, and cyber electromagnetic activities. This regulation states implementing polices and responsibilities for conducting test and evaluation and authorizes the procedures in DA Pam 73–1.

Applicability. This regulation applies to the Regular Army, the Army National Guard/Army National Guard of the United States, and the U.S. Army Reserve, unless otherwise stated. It also applies to personnel involved in all phases of test and evaluation in research, development, acquisition, and support of materiel items and systems. It applies to the test and evaluation of all Department of the Army acquisition programs, including information technology systems (also designated as national security systems or defense business systems); special access programs (unless specifically excepted per program charter); medical systems; computer resources integral to those items or systems; system and non-system training aids, devices, simulations, and simulators; embedded training; embedded testing; and instrumentation, targets, and threat simulators. It applies to command, control, communications, and computers/information technology systems where the Army is the executive agent for another organization or Service or where a command, control, communications, and computers/information technology system is developed cooperatively with other governments unless such organizations can assure their compliance.

Proponent and exception authority. The proponent of this regulation is the Assistant Secretary of the Army (Acquisition, Logistics and Technology). The proponent has the authority to approve exceptions or waivers to this regulation that are consistent with controlling law and regulations. The proponent may delegate this approval authority, in writing, to a division chief within the proponent agency or a its direct reporting unit or field operating agency, in the grade of colonel or civilian equivalent. Activities may request a waiver to this regulation by providing justification that includes a full analysis of the expected benefits and must include formal review by the activity's senior legal officer. All waiver requests will be endorsed by the commander or senior leader of the requesting activity and forwarded through their higher headquarters to the policy proponent. Refer to AR 25–30 for specific guidance.

Army internal control process. This regulation contains internal control provisions in accordance with AR 11–2 and identifies key internal controls that must be evaluated (see appendix C).

Supplementation. Supplementation of this regulation and establishment of command and local forms are prohibited without prior approval from the Assistant Secretary of the Army (Acquisition, Logistics and Technology).

Suggested improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) via email to usarmy.pentagon.hqda-asa-alt.mbx.asa-alt-publication-updates@army.mil.

Distribution. This regulation is available in electronic media only and is intended for the Regular Army, the Army National Guard/Army National Guard of the United States, and the U.S. Army Reserve.

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*This publication supersedes AR 73-1, dated 16 November 2016.

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Glossary

Chapter 1
Introduction

1–1. Purpose
This regulation implements the policies and procedures of Department of Defense directive (DoDD) 5000.01, DoDD 3200.11, Department of Defense instruction (DoDI) 5000.02, DoDI 5134.17, and Joint Capabilities Integration and Development System (JCIDS) Manual by specifically prescribing implementing policies and assigning responsibilities for test and evaluation (T&E) activities performed within the Army acquisition system. It applies to all systems developed, evolved, acquired, and managed under the auspices of AR 70–series and DoDI 5000.02. This regulation applies to Army participation in multi-Service operational test and evaluation (MOT&E) and joint test and evaluation (JT&E). It also provides guidance and establishes procedures governing the Test and Evaluation Managers Committee (TEMAC) and the Test Schedule and Review Committee (TSARC) which are continuing intra-departmental Army committees. Programs with the additional designation of Major Defense Acquisition Program (MDAP) and Major Automated Information System (MAIS) carry the greatest consequences in terms of T&E reporting requirements, documentation, and analysis to support program acquisition decisions.

1–2. References
See appendix A.

1–3. Explanation of abbreviations and terms
See the glossary.

1–4. Responsibilities
Responsibilities are listed in chapter 2 and appendix B.

1–5. Overview of test and evaluation management and planning
a. The senior Army official providing oversight on all Army T&E policy and procedural issues is the Army T&E Executive within the Office of the Deputy Under Secretary of the Army (DUSA).

b. T&E is conducted in order to support the Army's Title 10, United States Code (10 USC) equipping responsibility, and in support of other Services' acquisition activities in accordance with Department of Defense (DoD) reliance policy. T&E also supports developmental activities in the requirements-to-fielding cycle by providing senior leaders sufficient knowledge and understanding to make informed decisions about the marginal benefits, costs, and risks of fielding an acquisition system. T&E continues to support the Army's acquire-to-retire cycle by providing senior leaders knowledge on the continued quality of the deployed system, value of fixes and updates, and benefits, costs, and risks of planned system improvements. T&E provides an understanding about how the system meets (or continues to meet) the user intent, serviceability, and suitability for inclusion (or continuation) in the Army, and whether the system provides (or continues to provide) appropriate survivability against emerging validated threats. From the perspective of T&E activities, planning, and management begins with user identified requirements to fill an operational capability gap or take advantage of an opportunity, with the associated deployment context. Upon documentation of the requirements, a system evaluation plan (SEP) is developed to identify what data and information will need to be known (and at what level of precision, accuracy, and density) in order to verify: (1) delivery of a system that meets the user intent; (2) associated costs of the system to the user, unit, and other Army systems; (3) system vulnerabilities to enemy activities; and (4) remaining system known risks that cannot, as yet, be quantified. The Test and Evaluation Master Plan (TEMP) provides a framework for the delivery of the data and information, along with the goals and objectives of each data source (that is, tests, models, simulations, and analyses), which are used to provide the scope for resources and timelines. Based upon the approved TEMP, developmental and operational test design plans (TDPs), along with detailed test plans (DTPs), are developed. Based on each data source's relevant report, an early operational assessment (EOA) report, operational assessment (OA) report, and system evaluation report (SER) will be developed by the independent system evaluation organization. These reports support senior leader needs as a compendium of all currently available relevant data and information with particular emphasis on likely operational performance for the unit when fielded. An OA is generally rendered to support low-rate initial production (LRIP) and for fielding release. A SER is rendered to support the full-rate production (FRP) and/or the full deployment (FD) decision. Planning for T&E activities should begin early in order to minimize retesting to acquire specific data requirements.

c. Planning for T&E begins at pre-acquisition category technology projects; that is, during science and technology developmental and maturation projects and extends through development and acquisition to (finally) materiel release. As an essential element of continuous evaluation (CE) for a new system or new technology being considered for development, independent system evaluators participate in the force modernization or branch proponent review of the initial capability requirements and/or defense business system (DBS) problem statement documents.

d. T&E working-level integrated product team (WIPT).

(1) The materiel developer (MATDEV) will charter a T&E WIPT. The MATDEV, program executive officer (PEO), or acquisition authority for all systems (regardless of acquisition category (ACAT) level) will charter the T&E WIPT as soon as practical after the materiel development decision (MDD). The T&E WIPT will assist the MATDEV in managing the system's T&E throughout its life cycle. The primary objective of the T&E WIPT is to develop the T&E strategy which is documented in the TEMP. The T&E strategy includes both developmental evaluation and operational evaluation viewpoints and is based upon the approved capability requirements document, approved acquisition strategy (traditional or accelerated), or the DBS Problem Statement, the system threat assessment report (STAR), and critical operational issues and criteria (COIC). These, in turn, affect the T&E planning, execution, and reporting cycles.

(2) The T&E WIPT can be composed of representatives from all involved organizations listed in paragraph 8–2. The MATDEV normally chairs the T&E WIPT. Chapter 8 provides additional T&E WIPT details.

e. TEMP—

(1) An approved TEMP is required at Milestone A and is updated prior to the development request for proposal (RFP) release decision point, as well as each subsequent acquisition milestone. The TEMP is the program manager's (PM's) concept of operations (CONOPS) flow for the T&E campaign plan of the program. It contains the strategy to obtain the data and information required for the system assessment and/or evaluation by describing what (and how much) testing is required, where (and when per the integrated test program schedule) the testing will be performed, who will perform the testing, and listing what resources will be needed. The logistical support aspects of the TEMP in terms of time, space, costs, and availability of test and testing assets must be feasible and supported by the acquisition program baseline. The TEMP will not require a commitment of resources to acquire data unless that data is required by the SEP. The TEMP is the authoritative document for generating T&E plans and reports.

(2) All acquisition programs require a TEMP, except for certain programs involving investigational drugs, biologicals, and medical devices involving humans and/or rapid acquisitions as indicated in paragraphs 10–2*c*(8) and 10–2*c*(9). All testing planned during the acquisition of a system, including the live fire test and evaluation (LFT&E) strategy, will be identified in the TEMP. There will be one TEMP per system or increment. An Army approved TEMP is required before commitment of (acceptance to provide) T&E resources, with the only exception being valid emerging test requirements necessary for long-term planning.

(3) The MATDEV has the overall responsibility to develop the TEMP. However, all T&E WIPT members contribute to the TEMP development and updates. Upon approval by the appropriate authority, (that is, the T&E Executive for all ACAT I, ACAT II programs when Headquarters, Department of the Army (HQDA) is the milestone decision authority (MDA), and programs on the Office of the Secretary of Defense (OSD) T&E oversight or the cognizant PEO as the MDA for ACAT II and III programs) the TEMP serves as a contract for executing the T&E strategy among the PM and/or MATDEV, the capability developer (CAPDEV) or force modernization proponent, and the T&E communities. The TEMP provides key internal controls for T&E in support of the acquisition process.

(4) Since the TEMP is considered a signed contract, all T&E activities contained in the approved TEMP must be executed unless circumstances warrant a waiver from the TEMP approval authority.

(5) If there is a conflict in terms of risk (either known or unknown) versus the cost in time and money between the T&E planning needed to complete the relevant system assessments and/or evaluations and the PM's expressed resource constraints, then the senior acquisition, T&E, and operational user chains of command must adjudicate.

f. Evaluation planning and reporting—

(1) An essential document for T&E planning is the SEP. The SEP documents the system evaluation strategy, as well as the data needs and required data sources for the system's entire developmental cycle through fielding. Accordingly, all SEPs should be tailored to the needs of the senior decision makers in relation to the risks involved to the Army. For the required data sources, the SEP should strive to identify the lowest cost means of collecting the data with the precision and accuracy associated with attendant senior leader decision risk. This risk can be assessed in terms of decision risks (for those senior leaders balancing many systems and Army lines of operation across doctrine, organization, training, materiel, leader development and education, personnel, facilities, and policy (DOTMLPF–P)), total costs to the Army, benefits for the Army, impact on Soldier survivability, and Army cyber vulnerabilities which are all enduring metrics for consideration. One area where knowledge risk will always be minimized is Soldier survivability. The SEP can point to the suggested reuse of existing test data, use of planned contractor tests (when done

in accordance with conditions and processes recommended and witnessed by an Army T&E organization), modeling and simulation (M&S), field data (as supplemental or when applicable), or other sources. The SEP enables the T&E WIPT to identify what needs to be known, that can only be known through test. The detailed information contained in the SEP supports concurrent development of the TEMP. The SEP is focused on the evaluation of the system in the context of mission accomplishment, performance, safety, health hazard, operational effectiveness, operational suitability, and survivability. It establishes the required context for understanding of the system in terms of the user's intent (that is, the critical operational issues (COIs)), the user's specified capability requirements, any system-specific areas for evaluation or performance tracking (as identified by the PM), and the system's required interfaces and interactions when deployed. The SEP is also done in the context of the proposed fielding and full DOTMLPF–P use of the system, including the intended environments, the basis of issue plan (BOIP), the modified table of organization and equipment, planned tactics, techniques, and procedures (TTPs), the STAR, the new equipment training (NET) and system training plan, the energy plans, cyber electromagnetic activities (CEMA), and end-to-end effects threads. The independent system evaluator prepares the SEP in coordination with the T&E WIPT and, for OSD oversight programs, with the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation (DASD (DT&E)) and/or the Director, Operational Test and Evaluation (DOT&E).

(2) The TEMP documents the following evaluation methodologies:

(a) Starting at Milestone A, the TEMP describes an evaluation methodology that will provide essential information on programmatic and technical risks towards meeting the HQDA-approved COIs and the CAPDEV and/or force modernization proponent proposed requirements as well as information for major programmatic decisions. The TEMP will include a plan (typically via working link to the Systems Engineering Plan) to allocate top-level reliability requirements down to the components and subcomponents. Reliability allocations will include hardware and software, and will include commercial items and nondevelopmental items (NDIs).

(b) Starting at Milestone B, the TEMP will include an evaluation framework (from both a developmental and operational focus), to identify key data that will contribute to assessing progress toward achieving key performance parameters (KPPs), critical technical parameters (CTPs), key system attributes (KSAs), measures of effectiveness (MOEs), measures of performance (MOPs), interoperability requirements, CEMA requirements, threat requirements, reliability growth, maintainability attributes, developmental test (DT) objectives, and other measures or objectives, as needed. In addition, the evaluation framework will show the correlation and/or mapping between tests, key resources, and the supported decision. The evaluation and assessment methodology overview will show how the major tests and test phases link together to form a systematic, rigorous, and structured approach to evaluating system performance across the applicable values of the independent variables. Test resources identified in the TEMP will be derived from the system evaluation and/or assessment overview.

(3) A system assessment or system evaluation will have a technical and/or operational focus depending on the acquisition milestone and/or decision being supported and on the available credible data sources.

(a) Prior to the FRP and/or the FD decision review, evaluations can have a technical focus that is based upon DT results to assist the PM and decision makers in understanding the system's ability to meet its CTPs and COIs and its validated and derived capability requirements including its KPPs and KSAs. System assessments and system evaluations can be planned for acquisition purposes to inform the PM of the status of progress along the program's work breakdown structure, to support progress payments or award fees, and to support the acquisition reporting system of costs and schedule control system criteria.

(b) In support of Milestone C and FRP and/or FD decision reviews, system OA reports and SERs will include an operational focus based upon operational test (OT) results and will address a system's operational effectiveness, operational suitability, and survivability.

1. Operational effectiveness addresses a system's operational value through the intended operational gain to be delivered to the Army based upon HQDA-approved COIC that are focused on successful mission accomplishment. Whether or not this intended benefit is realized is primary justification for the program's continued funding and is generally expressed as operational effectiveness.

2. Operational suitability addresses a system's impact on other existing systems and Army operations, as well as the system's ability to withstand the existing constraints from the Army-generated force environment. It is critical to understand the ability of the institutional Army to provide, train, and equip the required unit personnel, maintain the depot support infrastructure, and provide stationing space and training ranges. It is also critical to understand the acquired system's cost, time, schedule, personnel, and space impacts on other systems, and whether the acquired system can successfully operate where the unit needs to operate.

3. Survivability addresses the capability of military forces to avoid or withstand hostile actions while retaining the ability to fulfill their primary missions. It is a key element of knowledge when proposing to acquire a system, since threats attempt to exploit aspects of the system in order to defeat our forces. Understanding how the system can defeat

active enemy actions is critical. Creating a capability to survive an enemy attack is one way of creating survivability; working to deny the enemy the opportunity to conduct an attack is another that can be exercised through doctrine or TTPs. Thus, the efficacy of any approach in the operational context also must be addressed.

g. Integrated testing process.

(1) Integrated testing is the collaborative planning and collaborative execution of test phases and tests to provide shared data in support of independent analysis, system evaluation, and reporting by all stakeholders, particularly, the developmental (both contractor and government) and operational T&E communities.

(2) To the extent feasible, DTs and OTs should be planned and conducted in an integrated and seamless fashion to provide the most efficient overall test program possible and to permit all stakeholders to use data in support of their respective functions.

(3) Integrated testing requires the active participation of the U.S. Army Test and Evaluation Command (ATEC) in planning with the PM so that the operational objectives are understood, testing is conducted in an operationally realistic manner, and resultant data are relevant for use in system assessments and system evaluations. For integrated test results to count as operational testing when the system is on DOT&E oversight, ATEC must develop the integrated test design plan for DOT&E's approval before the start of testing that, at a minimum, details the required test realism and conditions, OT objectives, OT metrics, and data collection requirements.

(4) PMs for all programs (and particularly accelerated and/or rapid acquisitions) may, in coordination with ATEC, elect to perform integrated testing in conjunction with training, Joint, and operational exercises, or synchronized tests. While such testing is efficient, it inherently increases the risk that a significant problem will not be discovered. If no subsequent OT is conducted prior to fielding, then additional testing will typically be required subsequent to initial fielding. When subsequent testing is required, the plan for the T&E and for the reporting of results will be included in the applicable TEMP or other planning documentation.

(5) All Army TEMP approval authorities will ensure that each initial and updated TEMP identifies test synchronization opportunities to include distributed testing. Test synchronization opportunities apply to the integrated testing and test bundling processes to enable tests to be conducted simultaneously or sequentially.

h. T&E key leadership position. The Under Secretary of Defense for Acquisition, Technology, and Logistics (USD (AT&L)), requires key leadership positions be assigned to each MDAP and MAIS program. A key leadership position requires a significant level of authority commensurate with the responsibilities and accountability for acquisition program success. Per 10 USC 1706, the Secretary of Defense shall require that each MDAP and MAIS program be supported by a properly qualified chief developmental tester. DoDI 5000.02 requires PMs for MDAPs and MAIS programs to designate a chief developmental tester in accordance with 10 USC 139 and 1706. The Defense Acquisition Management Information Retrieval System lists active programs. MDAP and MAIS program offices will be staffed with a qualified chief developmental tester, whose activities will be monitored and reviewed by the DASD (DT&E), per DoDI 5134.17.

(1) A chief developmental tester should be dedicated to a single ACAT I or information assurance (IA) program, be T&E Level III certified and compliant with existing T&E continuous learning policy. The chief developmental tester will be responsible for coordinating the planning, management, and oversight of all developmental test and evaluation (DT&E) activities; maintaining insight into contractor activities; overseeing the T&E activities of other participating government activities; and helping the PM make technically informed, objective judgments about contractor and government T&E planning and results. The chief developmental tester will normally chair the T&E WIPT.

(2) PMs for MDAPs will designate a government test agency to serve as the lead DT&E organization in accordance with 10 USC 139. The lead DT&E organization will be responsible for providing technical expertise on T&E issues to the chief developmental tester; conducting DT&E activities as directed by the chief developmental tester (or designee); supporting certification and accreditation activities; assisting the chief developmental tester in providing oversight of contractor tests; and assisting the chief developmental tester in reaching technically informed, objective judgments about contractor and government T&E planning and results. For all other programs (non-MDAPs), a lead DT&E organization should be used, when feasible, and identified in the TEMP.

i. Scientifically-based test and analysis techniques and methodologies. Scientifically based test and analysis techniques and methodologies will be used for designing an effective and efficient test program, as well as analyzing the subsequent test data. A top-level scientific and rigorous approach to designing an efficient test program that characterizes the system behavior across a variety of factors and conditions must be described starting at the initial and/or updated TEMP and SEP (and in sufficient detail in subsequent test design plans) as appropriate. At a minimum, the selected approach must address the following areas:

(1) Define the objectives of the test (or series of tests, when appropriate) for the defense acquisition phase in which the tests will be conducted.

(2) Identify the information required from each test to meet the test objectives.

(3) Identify the important factors, and associated conditions, that must be measured in obtaining the data required for analysis. Identify how those variables will be measured and controlled.

(4) Identify the analysis techniques to be used.

(5) Identify the test points required and identify their placement in the test space to maximize the information obtained from each test.

(6) If using a traditional hypothesis test for data analysis, calculate statistical measures of merit (power and confidence level) for the relevant response variables. Each relevant response variable will be quantified among the factors affecting operational performance, as well as the risk to the government of accepting a poorly performing system or incorrectly rejecting a system with acceptable performance. If using another statistical analysis technique, indicate what statistical measures of merit will be used. If a statistical analysis technique is not being used, discuss the analysis technique that is being used along with the supporting rationale.

(7) Selected test design plans should ensure more efficient integration of all types of testing up to and including a follow-on operational test (FOT). In all cases, the PM must be responsible for the adequacy of the planned series of tests and report on the expected decision risk remaining after test completion.

j. Test resources. Tests require adequate resources to be effective and efficient.

(1) Programs will use government T&E capabilities unless an exception can be justified as cost-effective to the government. PMs will conduct a cost-benefit analysis for exceptions to this policy and obtain approval through the TEMP approval process before acquiring or using nongovernment, program unique test facilities or resources. If a Major Range and Test Facility Base (MRTFB) activity cannot conduct a PM required DT, or if a cost-benefit cannot be derived by the use of a MRTFB activity, the PM has the authority to use contractor support.

(2) Test resource estimates (including but not limited to quantities of test articles, test sites, testbeds, test instrumentation, test support equipment, threat representation, targets, expendables, threat simulations, operational forces (both friendly and threat), joint mission environment, distributed test networks, funding, manpower, personnel, training, federal/state/local requirements, range requirements, and any special requirements (for example, explosive ordnance disposal requirements or corrosion prevention and control)) will be derived from scientifically defensible test methodology.

(3) Mission critical systems or mission critical functions and components capable of sending or receiving digital information which have a two-way data connection with a network external to the system (whether direct or indirect) will require a cooperative vulnerability and penetration assessment and an adversarial assessment that includes Red Team threat offensive cyberspace operations emulation. The level of testing required for systems that do not have a two-way connection with an external network will be determined by ATEC (and if on DOT&E oversight, approved by DOT&E on a case-by-case basis) based on an examination of system architecture and network protocols. For systems with incrementally fielded capabilities or frequent software upgrades, ATEC will assess the changes and consider previous testing results, known vulnerabilities, DT data, systems architectures, and other defensive mitigations in order to conduct a risk assessment at each delivery and propose an appropriate level of cybersecurity testing. Adequate test programs gather sufficient data to identify all significant vulnerabilities of a system in the operational environment so as to capture the effect on mission accomplishment in the presence of a realistic cyber threat. Each cooperative vulnerability and penetration assessment and each adversarial assessment should be executed in an operationally realistic environment.

(4) When required by the T&E strategy, the test environment for cybersecurity and electronic warfare will be budgeted and resourced with the integrated test program schedule documented in the approved TEMP and will include activities to test and evaluate the system in a mission environment consisting of a representative cyber threat and electronic warfare threat capability.

(5) Systems that operate as part of a system-of-systems (SoS) may require deployment of additional test assets to evaluate end-to-end capabilities. PMs will ensure that adequate testing of total SoS performance is conducted as part of the DT&E Program.

(6) Test resources will reflect the best estimate (as justified by analysis) for conducting all tests and will be mapped against the evaluation framework and schedule within the approved TEMP to ensure adequacy and availability.

(7) The TSARC provides Army level centralized management of resources for Army tests, MOT&E, JT&E, and experimentation/demonstrations (see chap 9). The TSARC maximizes the use of limited resources while minimizing the impact on unit operational readiness. The TSARC, as a decision making body for the Army, coordinates all required resources, synchronizes tests (either integrated or bundled), and reviews schedules. The TSARC validates resource requirements and recommends Deputy Chief of Staff (DCS), G–3/5/7 approval/disapproval of the semi-annual Five-Year Test Program (FYTP).

(8) The TSARC manages support to experiments, investigations, demonstrations, studies, and other efforts that generally do not require a TEMP. Requesting entities (for example, PMs for technical manual verification, logistics

demonstration (LD), or advanced technology demonstration (ATD)) for these efforts will be required to provide a test resource plan (TRP) to the TSARC with an optimal minimum notification of 2 years prior to the resource date for units and 180 days prior for Soldiers, civilians, equipment, supplies, ammunition, flying hours, and other assets.

(9) The Army FYTP is a compendium of TRPs, approved by DCS, G–3/5/7, for a 5-year period commencing with the current fiscal year. The FYTP is published every 6 months. The TRPs in the approved FYTP become official Army tasking documents for those committing organizations that provide resources for current and budget years and planning guidance for the out years.

k. The Army T&E Enterprise strategy provides strategic direction for future Army T&E infrastructure and investments in concert with the Army Modernization Strategy and Army Science and Technology Master Plan. It also provides an overview of the current Army T&E facilities and capabilities, guidance to initiate program objective memorandum (POM) T&E submissions, and a summary of the overarching T&E Enterprise vision. Specifically, the Army T&E Enterprise strategy prescribes the current program year's capability end states and the future years' defense plan/program. It provides insight to the long-range investment requirements analysis process to ensure synchronization with the 30 year plan.

l. The Army T&E Enterprise consists of the following organizations:

(1) U.S. Army Space and Missile Defense Command/Army Forces Strategic Command (USASMDC/ARSTRAT).

(2) ATEC consisting of the Headquarters, U.S. Army Evaluation Center (AEC), U.S. Army Operational Test Command, and test centers.

(3) U.S. Army Materiel Systems Analysis Activity (AMSAA).

(4) U.S. Army Research Laboratory Survivability and Lethality Analysis Directorate (SLAD).

(5) Project manager for instrumentation, targets and threat simulators (PM ITTS).

m. The Army TEMAC is established and convened by the committee chair to accomplish specific T&E objectives. The TEMAC will serve as a centralized departmental committee supporting the U.S. Army T&E, the acquisition, and the requirements generation communities. TEMAC will forge efficient and effective working relationships among MATDEVs and CAPDEVs, testers, system evaluators, and others participating in the Army T&E process. TEMAC will sponsor other forums, as required, to provide centralized T&E management.

n. In addition to AR 70–1 acquisition programs, provisions of this regulation also apply to T&E of all ancillary equipment and components, such as nonsystem training devices (see AR 350–38), ground support equipment, and field maintenance test sets.

o. Testing performed by the National Security Agency on communications security equipment will fulfill the requirements of this regulation.

p. Where critical environmental concerns have been identified, T&E will be performed to identify and quantify the emissions, effluents, wastes, and other environmental impacts of the acquisition system (see generally, AR 200–1).

q. Army T&E management and planning supports multi-Service acquisition programs (see para 3–10) and JT&E (see para 3–11).

Chapter 2
Responsibilities

2–1. Assistant Secretary of the Army (Acquisition, Logistics and Technology)

The ASA (ALT) will—

a. Execute research, development, test, and evaluation (RDT&E) and Army procurement appropriation (APA) funds for T&E.

b. Assist the Army T&E Executive in developing T&E policy.

c. Provide members for the TEMAC and General Officer (GO) and Council of Colonels (CoC) TSARC to represent ASA (ALT) and PEOs (see chaps 1 and 9).

d. Ensure PEOs and PMs adhere to the timelines established by the TSARC for obtaining Soldiers, civilians, units, equipment, and other assets in support of T&E. In support of the TSARC—

(1) Synchronize integrated or bundled test candidates' acquisition milestone decision dates and fielding plans to support planning and execution of integrated/bundled testing.

(2) Provide the initial and subsequent updates of the acquisition program baseline threshold and objective "Test Windows."

e. Using data provided by ATEC, the ASA (ALT) will—

(1) Perform the integrated product support (IPS) program surveillance for Army materiel systems.

(2) Perform logistics supportability assessments.

(3) Evaluate the logistics supportability for all materiel acquisition programs and deployed systems, except for medical items for which the U.S. Army Medical Command (MEDCOM) is responsible.

(4) Oversee and evaluate the logistics aspects of materiel acquisition and modification programs and deployed systems to ensure supportability.

(5) Participate in program reviews, the supportability WIPT, the T&E WIPT, and other working and review groups.

(6) Participate in the development of requests for proposal, statements of work, and contract data requirements lists.

(7) Serve as the independent acquisition logistician for all systems, except medical systems for which MEDCOM is responsible.

(8) Provide funding to the U.S. Army Training and Doctrine Command (TRADOC) DCS, G–2, Fort Eustis, VA, in support of threat test support package (TSP) development for operational testing of all non-TRADOC proponent acquisition programs of record.

f. Provide IPS and related T&E policy to include input to program management documents (see AR 700–127, and see generally, AR 750–1).

g. In coordination with PM ITTS within the Program Executive Office, Simulation, Training, and Instrumentation—

(1) Serve as the Army's manager and the proponent for major test instrumentation, targets, and threat simulators (ITTS) and represent the U.S. Army on Joint Service programs.

(2) Plan, program, budget, defend, and oversee the execution of major test ITTS funding.

(3) Provide input to the Army T&E Enterprise strategy.

(4) Coordinate and consolidate customer technical and functional requirements for ITTS.

(5) Monitor threat representative targets and threat simulators/simulations to ensure they are programmed for validation.

(6) Participate in the development of the Central Test and Evaluation Investment Program (CTEIP).

(7) Maintain a capability inventory of current Army test ITTS for assigned systems.

(8) Initiate the development, engineering, procurement, and modification of major ITTS programs and deliver them to user organizations for accountability, operation, and maintenance.

(9) Provide representation to Validation and Threat Accreditation Working Groups (WGs) for targets and threat simulators.

(10) Coordinate, consolidate, and recommend development priorities for test ITTS requirements developed by Army and DoD user agencies and document them in a long-range plan.

(11) Manage foreign test ITTS required to support T&E not managed by ATEC.

h. By means of the PM ITTS–

(1) Through oversight by the Army T&E Executive, execute funding in direct support of the development, acquisition, fielding, and test support associated with Army requirements for major test instrumentation and threat representations and environments.

(2) Provide full acquisition and materiel development rigor in accordance with all established regulatory guidelines on all programs of record (see AR 70–1).

(3) Provide full life cycle cost management in accordance with the approved threat capability requirements document and any applicable memorandums of agreement (MOAs) and memorandums of understanding (MOUs).

(4) Ensure each managed threat system can fully function from the individual and collective training level through basic threat company operations.

(5) For tests generating data in support of survivability evaluation of systems that operate in cyber and electronic warfare environments–

(a) Manage personnel and tools used to conduct testing techniques and procedures over open or closed networks in accordance with all appropriate U.S. statutes, regulations, policies, and guidance.

(b) Lead threat offensive cyberspace operations efforts, leveraging expertise from other Government agencies, as appropriate.

(c) Provide management and oversight of the execution of relevant cyber blue vulnerability assessment capabilities.

(6) Support ATEC in the execution of the ATEC threat POM advocacy process.

(7) Serve as the item manager for all ATEC requested threat representation requirements/needs involving threat materiel development (to include M&S), acquisition, fielding, operation, and maintenance in support of Army DTs and/or OTs and threat technology initiatives executed through OSD funding (that is, CTEIP).

(8) As a voting member, provide technical support to the Army's Validation WG to facilitate support of operational T&E and in support of DT where the data derived will support a milestone decision (see AR 381–11).

(9) Develop and maintain, on a reimbursable basis, a capability to support ATEC's threat accreditation efforts in support of T&E.

(10) Serve as a voting member on the Threat Accreditation WG.

i. Request and coordinate all operational resources, including Soldiers, for experiments, investigations, demonstrations, studies, tests, system assessments, and system evaluations through the integrated Army Force Generation (ARFORGEN) and/or TSARC process (see AR 525–29).

j. Through the Executive Director, System of Systems Engineering and Integration, plan, conduct, and fund all integrated tests except for programs of record.

k. In support of the Weapon System Review, ensure the MATDEV and/or the PM identifies all test resources and requirements, including ammunition (both funded and unfunded).

l. Ensure that that each PEO and PM (who acts as MATDEV) under ASA (ALT) supervision complies with the responsibilities listed in appendix B.

2–2. Deputy Under Secretary of the Army

Through the Army T&E Executive, the DUSA will—

a. Oversee all Army T&E missions and functions, to include formulating overarching Army T&E strategy, policy, and program direction, providing policy oversight, and managing resources.

b. Serve as the HQDA coordination agent for all T&E policy, resource programming, and related programmatics.

(1) Oversee all Army T&E associated with the research, development, and acquisition of all systems.

(2) Provide oversight for the budget of T&E facility institutional costs and maximize use of current capabilities of the HQDA MRTFB activities (see DoDD 3200.11). Ensure the implementation of a reimbursement system for user charges and represent the Army in intergovernmental management coordination processes. Develop and monitor Army MRTFB management funding policy.

(3) Develop, coordinate, and execute the Army T&E Enterprise strategy by providing policy guidance and procedure updates to the T&E community for resource planning and justify/explain the T&E resource needs to the Army, DoD, and Congress.

(4) Coordinate and oversee T&E investment funding for RDT&E and APA accounts and OT support for the Army T&E Enterprise.

(5) Oversee and validate the requirements for major instrumentation.

(6) Administer the Army portion of the DoD CTEIP.

c. Serve as the Army member of the T&E Executive Board of Directors (BOD) and chair the BOD during a designated 2-year period.

d. Consult with the OSD (DASD (DT&E) and DOT&E) on behalf of HQDA by recommending candidate acquisition systems for DT, OT, and/or live fire (LF) oversight.

e. Manage the staffing and approval process for TEMPs requiring HQDA approval.

f. Approve test-related documentation (T&E strategies) for HQDA and when required, forward it to the OSD for approval. Endorse OT and LF test design plans. Coordinate and facilitate communication with OSD on all T&E matters.

g. Provide staff management of all test programs of interest to the Office of the Secretary of the Army.

h. Chair the Armywide TEMAC.

i. Provide HQDA oversight on the funding of the Army Threat Simulator Program, Army Targets Program, and Army Instrumentation Program and coordinate with the PM ITTS.

j. Ensure that threat representative targets and threat simulators are validated to support accreditation of each specific application by chairing the Army Threat Validation WG and approving Army threat validation reports for targets and threat simulators and/or simulations.

k. Ensure Army T&E policy and procedures reflect environmental policy (see AR 200–1).

l. Represent the Army in OSD forums for coordinating T&E policy and resources.

m. Serve as the functional chief for the T&E Acquisition Career Field workforce.

n. Oversee Army responsibilities in JT&E, Foreign Comparative Testing, and multi-Service and multi-national T&E acquisition programs.

o. Serve as the Army representative in the Defense Test and Training Steering Group.

p. Serve as an advisor to the Army's voting representative on the JT&E Senior Advisory Council.

q. Serve as the T&E Executive for the DoD Chemical and Biological Defense Program (CBDP) to ensure adequacy of T&E programs and infrastructure by:

(1) Providing CBDP T&E strategy, policy, oversight, and issue resolution.

(2) Establishing and sustaining common processes and standards; coordinating and overseeing CBDP investment in T&E infrastructure.

(3) Providing T&E guidance and strategy approval for chemical, biological, radiological, and nuclear (CBRN) defense acquisition programs.

r. Serve as a nonvoting member T&E technical expert to the Army Business Council.

s. Provide a member to the GO and CoC TSARC (see chap 9) and T&E WIPT, when requested.

2–3. Chief Information Officer/G–6

The CIO/G–6 will—

a. Supervise command, control, communications, and computers (C4) and information technology (IT) functions (including T&E life cycle management) and certify IT expenditures in support of the Army Acquisition Executive (AAE).

b. Plan, program, and budget operation and maintenance, Army (OMA) funds for fixed and recurring costs for testing of the network and IT systems assigned to U.S. Army Communications and Electronics Command (CECOM).

c. Review, coordinate, and approve COIC for non-tactical C4 and IT programs to include all Army DBSs.

d. Execute staff responsibilities for information management, including IT and national security systems, as the CIO for the Army and provide technical oversight and technical guidance to the Army's interoperability test agent.

e. Manage the Army interoperability certification (AIC) process and certify digital interoperability between Army IT and national security systems.

f. Establish reliability, availability, and maintainability (RAM) requirements, operational mode summary/mission profile (OMS/MP), and failure definition and scoring criteria (FD/SC) with the MATDEV's assistance (see AR 702–19).

g. Assist the Army T&E Executive in developing information management, including IT, CEMA, and national security systems related T&E policies.

h. Provide members to the TEMAC and to the GO and CoC TSARC (see chaps 1 and 9) and T&E WIPT, when requested.

2–4. Director of Army Safety

The DAS, assisted by the Commanding General (CG), U.S. Army Combat Readiness Center will—

a. Develop, establish, coordinate, and disseminate policy, guidance, and procedures for system safety as an element of the Army Safety Program based upon strategic policy developed by Assistant Secretary of the Army (Installations, Energy and Environment), statutory requirements, and national standards in support of the Army's mission.

b. Advise the Army Staff, the Chief of Staff, Army, the Army Secretariat, and the Secretary of the Army on matters relating to the Army Safety Program and its implementation and effectiveness, to include system safety.

c. Execute an effective and efficient Army Safety Program, to include system safety, according to this regulation and statutory requirements, which provides safe and healthful work environments, missions, and operations and reduces accidents.

d. Provide a member to the TEMAC (see chap 1).

2–5. Deputy Chief of Staff, G–1

The DCS, G–1 will—

a. Ensure that Human Systems Integration (HSI) T&E concerns are addressed in appropriate T&E documents (see AR 602–2).

b. Provide a member to the GO and CoC TSARC (see para 9–3) and the T&E WIPT, when requested.

c. Review and provide the DCS, G–1 position during coordination and participate in the resolution of any issues leading to approval of COIC.

d. Perform HSI assessments (see AR 602–2).

2–6. Deputy Chief of Staff, G–2

The DCS, G–2 will—

a. Provide guidance on representation of threats in testing.

b. Develop threat policy and procedures, and provide Department of the Army (DA) approval of the threat and threat surrogates to be used for T&E for ACAT I (IC and ID) programs, ACAT IA (IAM and IAC) programs, ACAT II programs, and programs on OSD T&E oversight (see AR 381–11).

c. Coordinate Defense Intelligence Agency validation for ACAT ID programs and programs on OSD T&E oversight.

d. Review and provide the DCS, G–2 position during coordination and participate in the resolution of any issues leading to approval of the STAR and threat TSP (see AR 381–11).

e. Establish RAM requirements, OMS/MP, and FD/SC with the MATDEV's assistance (see AR 702–19).

f. Provide a member to the TEMAC, as required, the GO and CoC TSARC and the T&E WIPT, when requested (see chap 1).

g. Serve as a voting member of the Army Threat Validation WG.

h. Serve as a voting member on the Threat Accreditation WG.

i. On behalf on the DCS, G–2, the CG, U.S. Army Intelligence and Security Command (INSCOM) will—

(1) Provide a member to the GO and CoC TSARC (see chap 9) and the T&E WIPT, when requested.

(2) Conduct T&E for assigned systems.

(3) Develop and maintain programs in compliance with guidance from the Army Human Research Protections Office (AHRPO) for testing determined to involve human subjects research (see AR 70–25).

(4) Provide a member to the TEMAC (see chap 1).

(5) Serve as the intelligence and security CAPDEV in accordance with AR 71–9.

(6) By means of the National Ground Intelligence Center, appoint a standing member to the Army Threat Validation WG and a member (when requested) to the Threat Accreditation WG.

(7) Manage and execute the Offensive Cyberspace Operations Capability Technical Assurance Standard (TAS) program by—

(a) Conducting evaluation and certification of offensive cyberspace operations capabilities in accordance with DoDI O–3600.03 and its attached TAS.

(b) Providing a representative to advise the Under Secretary of Defense for Intelligence on matters and technical issues pertaining to the TAS.

(c) Assigning responsibilities and developing procedures for TAS evaluations and certification at each evaluated level of assurance.

2–7. Deputy Chief of Staff, G–3/5/7

The DCS, G–3/5/7 will—

a. Review and provide a position during the coordination and participate in the resolution of any issues leading to COIC approval.

b. Assist the Army T&E Executive in developing T&E policy.

c. Provide a member to the TEMAC (see chap 1) and the T&E WIPT, when requested.

d. Provide oversight for the TSARC process:

(1) Provide a member to serve on the GO and CoC TSARC.

(2) Provide guidance to the TSARC chair, as necessary, and approve the semi-annual FYTP (see chap 9).

(3) Prioritize and submit the FYTP to the source providers (Army commands (ACOMs), Army service component commands (ASCCs), and direct reporting units (DRUs)) in the integrated requirements priority list for sourcing.

e. Provide a representative for the T&E WIPT, as required.

f. Provide a voting member on the Army Threat Validation WG for M&S related validation efforts.

g. Provide a voting member on the Army T&E M&S WG.

h. Monitor T&E programs that affect the Army's mission responsibilities.

i. Capture, validate, prioritize, and submit Army T&E requirements to ARFORGEN including Joint training and exercise requirements and Army experimentation requirements (see AR 525–29).

j. Participate in Joint Mission Environment Test capability forums.

k. Manage the ammunition and missile requirements for resourcing for all Army tests, evaluations, and experiments via the Total Army Munitions Requirements Process (see AR 5–13).

2–8. Deputy Chief of Staff, G–4

The DCS, G–4 will—

a. Review and provide the DCS, G–4 position during coordination and participate in the resolution of any issues leading to COIC approval.

b. Provide a member to the GO and CoC TSARC (see chaps 1 and 9).

2–9. Deputy Chief of Staff, G–8

The DCS, G–8 will—

a. Ensure T&E efforts for programs are budgeted and synchronized based upon the Army T&E Executive advice while being in compliance with the Army Vision, Army POM, and the Planning, Programming, Budgeting, and Execution procedures.

b. Review, coordinate, and approve COIC for all materiel programs including tactical C4 and IT systems.

c. Assist the Army T&E Executive in developing T&E policy.

d. Provide a member to the TEMAC and to the GO and CoC TSARC (see chaps 1 and 9) and the T&E WIPT, when requested.

e. Provide the chairs for the nonstandard equipment CoCs and the GO steering committee.

f. Serve as the HQDA point of contact and provide oversight for OSD-chartered JT&E. Manage, solicit, and coordinate Army participation in JT&E. Provide Army members to the JT&E Planning Committee and the JT&E Senior Advisory Council. Provide an Army liaison to OSD for JT&E issues. Issue the annual call for Army JT&E nominations (see para 3–11).

2–10. Chief of Engineers

The COE will—

a. Support the MATDEV in the development of materiel for operation in extreme climatic conditions in accordance with AR 70–38.

b. Review digital terrain data for accurate representation in demonstrations and tests.

c. Establish RAM requirements, OMS/MP, and FD/SC with the MATDEV's assistance (see AR 702–19).

d. On behalf of the COE, the CG, U.S. Army Corps of Engineers (USACE) will—

(1) Serve as the force modernization proponent, tester, and system evaluator for the DCS, G–3/5/7 assigned systems (civil works and military construction) (see AR 5–22).

(2) Provide a member to the TEMAC, as required, and to the GO and CoC TSARC (see chaps 1 and 9).

(3) Perform system evaluation for assigned systems in accordance with ATEC policies and procedures.

(4) Develop and maintain programs in compliance with guidance from the AHRPO for testing determined to involve human subjects research (see AR 70–25).

(5) Establish RAM requirements, OMS/MP, and FD/SC with the MATDEV's assistance as delegated by the COE (see AR 702–19).

(6) On a cost-reimbursable basis, provide geospatial expertise and support to ATEC.

(7) On a cost-reimbursable basis, provide geospatial expertise and support to the CIO/G–6 in support of AIC.

(8) On an "as available" basis, generate and provide M&S terrain products to support analysis, testing, and experimentation in support of the acquisition of Army and other defense systems and other customers such as other Federal agencies, State, and local governments, foreign and allied governments, and private industry.

2–11. The Surgeon General

TSG will—

a. Have staff responsibility for the health hazard assessment (HHA) program under AR 40–10.

b. Support testers and system evaluators concerning the HHA Program (see AR 40–10).

c. Develop policies consistent with both DoDI 3216.02 and AR 70–25 concerning the oversight and execution of policies addressing the use of humans as volunteers in research, test, and evaluation.

d. Establish RAM requirements, OMS/MP, and FD/SC with the MATDEV's assistance (see AR 702–19).

e. Through the Director, AHRPO, provide guidance to the test community on policies and procedures governing testing determined to involve human subjects research.

f. As a DRU to TSG, the CG, MEDCOM will serve as the force modernization proponent, trainer, tester, and system evaluator for assigned U.S. Army Medical Department DOTMLPF–P requirements (see app B). The CG, MEDCOM will—

(1) Conduct medical research, development, testing, and evaluation; manage Army medical materiel; educate and train personnel; and develop medical concepts, doctrine, and systems to support Army health care delivery.

(2) Have staff responsibility for the HHA program under AR 40–10.

(3) Provide centralized T&E management by assigning a T&E manager and by providing representation to T&E forums as required.

(4) Provide a member to the TEMAC as required and to the GO and CoC TSARC (see chaps 1 and 9).

(5) Perform system evaluation for assigned systems.

(6) Develop and maintain programs in compliance with guidance from the AHRPO for testing determined to involve human subjects research (see AR 70–25).

g. Through the CG, U.S. Army Medical Research and Materiel Command, will—

(1) Perform the duties as developmental tester for medical systems for TSG (see AR 40–60).

(2) Provide system safety and health data, to include safety and HHAs and releases, on medical materiel and system acquisition programs.

(3) Coordinate testing of all nondevelopmental medical systems, items, and medical assemblages.

(4) Perform the IPS program surveillance for Army medical materiel systems (see, generally AR 700–127).

(5) Perform IPS assessments for Army medical materiel. (See generally AR 700–127.)

h. Through the CG, U.S. Army Medical Department Center and School, will—

(1) Serve as the force modernization proponent for MEDCOM (see AR 5–22).

(2) Be responsible for medical support of OT, provide consultants, subject matter experts, and test players to the test organizations to assist with test planning, execution, and reporting.

(3) Using the U.S. Army Medical Department Board, perform the duties of an operational tester and system evaluator for medical materiel systems, materiel systems having medical implications, and medical C4I/IT.

i. Through the CG, U.S. Army Center for Health Promotion and Preventative Medicine, will conduct and provide a HHA for acquisition programs (see AR 40–10).

2–12. Assistant Chief of Staff for Installation Management

The ACSIM provides oversight to the CG, U.S. Army Installation Management Command (IMCOM). The CG, IMCOM will—

a. Provide a member to the GO and the CoC TSARC (see chap 9).

b. Provide base support services in support of T&E in accordance with current DoD and Army policy.

2–13. Commanding General, U.S. Army Materiel Command

The CG, AMC will provide technology, acquisition support, and logistics to the Army and will—

a. By means of the U.S. Army Research, Development, and Engineering Command (RDECOM)—

(1) Appoint T&E managers at Headquarters, RDECOM and its major subordinate elements to provide centralized T&E management and representation to T&E forums, as required.

(2) Provide members to the TEMAC representing the U.S. Army Research Laboratory (ARL)/SLAD and each research, development, and engineering center and to the GO and CoC TSARC (see chaps 1 and 9).

(3) Provide input to the Army T&E Enterprise strategy.

b. By means of the CG, CECOM—

(1) Manage and provide test efforts for IT and cryptographic equipment as assigned by CIO/G–6 or AMC. Coordinate with ATEC through the T&E WIPT for the management of test efforts associated with assigned systems.

(2) Serve as advisor to OSD, CIO/G–6, and to AMC for C4 and IT on engineering programs and phases to include DT during the engineering life cycle, technical policy matters concerning transmission and communication systems, facilities, equipment standards and practices, RDT&E, and activities within DoD concerning industry standards and practices.

(3) Provide testing support as requested by the PM to obtain applicable Joint and AICs.

(4) Coordinate with all testers to provide a safety release before the start of pretest training for any test that uses Soldiers as test players for systems assigned by CIO/G–6 or AMC.

(5) Provide for M&S as it supports the system life cycle, to include workload, capacity, network, and peak performance tests for systems assigned by CIO/G–6 or AMC.

c. By means of the Director, ARL—

(1) Provide the Army's human factors engineering and other HSI resources through the Human Research and Engineering Directorate.

(a) Conduct research that directly impacts the Soldier by developing technologies that improve how humans interact with Army systems while mitigating adverse effects from threat systems. Such research is used to enhance the operational characteristics of Army systems that undergo the T&E process.

(b) Provide research to T&E organizations that optimize Soldier performance and Soldier/machine interfaces for maximum effectiveness. This includes extensive research in human perceptual, cognitive, and psychomotor performance that builds the framework for human factors and HSI advances and helps improve the effectiveness of fielded and developmental systems.

(c) Provide information to T&E organizations on human performance measurement, intelligent decision aids, human control of automated systems, control/display/workstation design, simulation, and human modeling, and HSI design and integration.

(2) Using ARL/SLAD, provide the Army's survivability, lethality, and vulnerability (SLV) analysis and evaluation support (for both materiel and personnel) adding value over the entire system life cycle.

(a) Provide SLV analysis and evaluation support over the entire life cycle of major Army systems and SoS. Help acquire systems that will survive and/or be highly lethal in all environments against the full spectrum of battlefield threats (ballistic, electronic warfare and cyber warfare).

(b) For CEMA events supporting Army T&E:

1. Provide penetration testing, vulnerability analyses, and vulnerability assessment in support of the AEC during DT and OT.

2. Provide penetration testing, vulnerability analyses, and vulnerability assessment in support of the CIO/G–6 during AIC events.

3. Provide protect, detect, react, and restore (PDRR) subject matter experts and analysis to AEC in support of OTs.

4. Manage personnel and tools used to conduct cybersecurity penetration testing, vulnerability analyses, vulnerability assessments, and PDRR analyses.

5. Lead penetration test teams, vulnerability assessment and analysis teams, and PDRR teams, leveraging expertise from other government agencies as appropriate.

6. Provide certified blue team cyberspace operations support to PM ITTS, as appropriate.

7. Provide threat offensive cyberspace operations support as needed.

8. Provide electronic warfare analyses, monitoring, and environments (laboratory, hardware-in-the-loop, anechoic chamber, DT, and airborne OT). In addition, provide electronic warfare environments for other OTs as requested by PM ITTS.

9. Serve as a member of the CEMA survivability subgroup to the T&E WIPT.

(c) Provide SLV analysis and system assessment/evaluation support to ensure the Soldier is survivable against the full spectrum of battlefield injury mechanisms.

(d) Provide advice and/or consultation and analyses on SLV issues to HQDA, PEOs or PMs, system evaluators, CAPDEVs, intelligence activities, and other DA and DoD activities.

(e) Conduct investigations, experiments, simulations, analyses, and develop associated methodologies and instrumentation to quantify SLV of Army and selected foreign weapon systems and personnel.

(f) Provide well-documented timely technical judgments on complex SLV issues.

(g) Perform special studies and make recommendations regarding tactics, techniques, procedures, or design modifications to reduce vulnerability, enhance survivability and lethality of Army materiel, and enhance the survivability of the Soldier and mitigate injuries.

(h) Perform electronic warfare vulnerability analyses, M&S, hardware-in-the-loop simulation, laboratory, anechoic-chamber, and open-air experimentation.

(i) Develop M&S tools, techniques, and methodologies for improving SLV analysis and system assessment and/or evaluation support for acquisition programs, LFT&E, and operational data from theater.

(j) Develop or identify appropriate injury criteria and methodologies for use in Army SLV analyses and assessments of the Soldier and non-combatants.

(k) Manage and execute the Army's live fire test (LFT) mission for Army aircraft systems.

(l) Serve as chair of the damage assessment teams for all Army LFT&E programs.

(m) Prepare pre-shot predictions for all Army LFT&Es except for strategic missile systems.

(n) Assess damage and conduct crew casualty assessments for all Army LFT&Es.

(o) Perform controlled damage and behind-armor debris vulnerability experiments, analyses, and M&S.

(p) Perform Soldier survivability assessments.

(q) Perform optical augmentation/electro-optical vulnerability analyses, M&S, hardware-in-the-loop simulation, laboratory, and open-air experimentation.

(r) Chair the Army Regional Structural Validation Working Group with support from National Ground Intelligence Center and the Standard Military Operations in Urban Terrain Target and Testing Board (see AR 381–11).

(s) Support ATEC in the execution of the ATEC threat POM advocacy process.

(t) Develop and maintain a capability to support ATEC in threat validation and accreditation; provide technical support to and serve as a voting member on Army's Threat Validation and Threat Accreditation WGs.

d. By means of the Director, Army Materiel System Analysis Activity (AMSAA) will—

(1) Support ATEC with early engineering reviews using the reliability scorecard to determine if an acquisition system is on a path to achieving the established reliability threshold.

(2) Serve as the co-lead with ATEC–AEC for the Army's Center for Reliability Growth.

(3) Provide analytical support to ATEC for test planning and conducting system assessments and evaluations.

(4) Use data generated during the T&E process to develop system performance data that can be used in combat simulations to evaluate systems, and that can be used as an operational tool (for example, the Joint Technical Coordinating Group for Munitions Effectiveness) to support weaponeering and collateral damage estimates.

2–14. Commanding General, U.S. Forces Command

The CG, FORSCOM will—

a. Appoint a T&E manager to provide centralized T&E management and representation to T&E forums as required.

b. Provide a member to the TEMAC and to the GO and CoC TSARC (see chaps 1 and 9).

c. When feasible, provide typical users in support of experiments, demonstrations, investigations, studies, tests, systems assessments, and system evaluations (based on the level of funding provided).

2–15. Commanding General, U.S. Army Training and Doctrine Command

The CG, TRADOC is the Army's primary CAPDEV, trainer, and operational architect for current and future forces. The CG, TRADOC will—

a. Determine and develop DOTMLPF–P solutions required to fulfill all designated Army and Joint required capabilities (see AR 71–9).

b. Integrate and submit capability requirements documents and/or DBS Problem Statements (for example, joint DOTmLPF–P change recommendations (DCRs), Army DOTMLPF–P integrated capabilities recommendations (DICRs), initial capabilities documents (ICDs), capability development documents (CDDs), and capability production documents (CPDs)) produced by the Army community to DCS, G–3/5/7 for validation, prioritization, and resourcing for Army Requirements Oversight Council (AROC) approval (see AR 71–9).

c. Assist HQDA in developing and maintaining an efficient Army capabilities determination process congruent and supportive of the JCIDS. This effort includes recommendations for HQDA Program Evaluation Group organizations to gain efficiencies and maintain integrated and synchronized DOTMLPF–P development efforts. Ensure determination process supports the ARFORGEN model (see AR 71–9.)

d. Manage the development of capability requirements documents.

e. Develop, guide, and coordinate Army COIC and submit to HQDA for approval. Propose draft COIs in support of the Materiel Determination Decision.

f. Establish and document the basis of RAM requirements, OMS/MP, and FD/SC in coordination with the U.S. Army Capabilities Integration Center (ARCIC), MATDEV, and ATEC (see AR 702–19).

g. Provide input to the ATEC Decision Support System (ADSS) for resources required by TRADOC experiments, evaluations, and demonstrations that require operational assets of any kind (Soldiers, equipment, supplies, ammunition, and flying hours).

h. Provide subject matter experts to serve as observers/controllers during the conduct of OTs.

i. Assist the Army T&E Executive in developing T&E policy.

j. Provide centralized T&E management by assigning T&E managers, as required.

k. Participate in the Army's JT&E candidate nomination process.

l. Provide ARCIC members to the TEMAC and to the GO and CoC TSARC (see chaps 1 and 9).

m. Provide training TSPs in support of OTs.

n. Provide operational test readiness statements (OTRSs) in support of operational test readiness reviews (OTRRs).

o. Develop the requirements for instrumentation to support training at Army training ranges.

p. Determine the need for a force development test or experimentation (FDT/E) as a standalone product or in support of an acquisition program.

q. For Nonstandard Equipment AROC non-materiel capability solutions and initiatives, review for disposition and documentation via a DCR or DICR.

r. Develop, coordinate, and approve the doctrine and organizational (D&O) TSP in preparation for OT. The D&O TSP will include the OMS/MP and references to specific tests that allow evaluation of all the requirements of the system under test. Operational tester and CAPDEV will use the D&O TSP to plan and execute the OT.

s. As a developer for system threat assessments reports—

(1) Develop, coordinate, and obtain approval and validation of the initial STAR and its updates prior to Milestone B. Review and support subsequent bi-annual reviews (see AR 381–11).

(2) Provide threat input into the TEMP and participate in on-site approval and validation of OT, and integrated/combined DT/OT threat portrayals in coordination with ATEC (see AR 381–11).

(3) Develop, coordinate, and approve (or, if required, obtain approval and validation of) the threat TSP for OT or combined/integrated DT/OT from the operational tester (see AR 381–11). Conduct (or assist DCS, G–2 in conducting) an assessment of the operational tester's implementation of the threat TSP and actual representation of the threat for the OT. Participate in OTRRs when necessary. Participate in on-site approval and validation of the OT and integrated/combined DT/OT threat portrayals in coordination with the ATEC (see AR 381–11).

(4) Ensure threat managers train and certify the training of all personnel providing threat support to the OTs prior to third OTRR (that is, OTRR three).

t. As an operator of battlefield laboratories, coordinate with ATEC and integrate OT planning early in battle laboratory experimentation to permit data to be collected for system assessment and/or evaluation and reduce future OT where possible.

u. Ensure that that each CAPDEV under CG, TRADOC supervision complies with the responsibilities listed in appendix B.

2–16. Commanding General, U.S. Army Special Operations Command

The CG, USASOC will—

a. Serve as the force modernization proponent as assigned by DCS, G–3/5/7 for special operations (SO) peculiar systems (see AR 5–22).

b. Provide centralized T&E management as required for SO peculiar systems by assigning a T&E manager and by providing representation to T&E forums.

c. Provide a member to the TEMAC and to the GO and CoC TSARC (see chaps 1 and 9).

d. Conduct operational testing for assigned SO peculiar systems.

e. When a SO peculiar system's use is anticipated outside of USASOC, enter into agreements with ATEC that address operational testing responsibility.

2–17. Commanding General, U.S. Army Space and Missile Defense Command/Army Forces Strategic Command

The CG, USASMDC/ARSTRAT will—

a. Provide test facilities and technical expertise in support of strategic national missile defense and, when requested, full envelope missile defense life cycle DT activities.

b. Maintain and operate the U.S. Army Ronald Reagan Ballistic Missile Defense Test Site (U.S. Army Kwajalein Atoll) in accordance with DoDD 3200.11.

c. Develop and maintain programs in compliance with guidance from the AHRPO for testing that is determined to involve human subjects research (see AR 70–25).

d. Provide centralized T&E management by assigning a T&E manager and by providing representation to T&E forums, as required.

e. Assist the Army T&E Executive in developing T&E policy.

f. Provide a member to the TEMAC and to the GO and CoC TSARC process when invited by the chairperson to participate in the TSARC process (see chaps 1 and 9).

g. Ensure that all strategic missile defense testing complies with the Intermediate-Range Nuclear Forces Treaty and the Anti-Ballistic Missile Treaty.

h. Comply with the Compact of Free Association (allows the use of the U.S. Army Kwajalein Atoll) between the U.S. and the Republic of the Marshall Islands.

i. Provide input to the Army T&E Enterprise strategy.

j. Develop the requirements for space and missile defense instrumentation that are specific to assigned programs and manage the acquisition of sustaining instrumentation.

k. Coordinate with ATEC and integrate OT planning early in battle laboratory experimentation to permit data to be collected for system assessment and system evaluation and to reduce future OT requirements, when possible.

l. Through a direct reporting PM—

(1) Exercise program management for assigned systems.

(2) Participate as a member of integrated product/process teams (IPTs) and T&E WIPTs on the acquisition of space and missile defense systems.

2–18. Commanding General, U.S. Army Test and Evaluation Command

The CG, ATEC will support the system acquisition, force development, and experimentation processes through overall management of the Army's T&E programs. ATEC is the Army's Independent Operational Test Agency (OTA) that reports directly to the Chief of Staff, U.S. Army (through the Director of the Army Staff and the Vice Chief of Staff, U.S. Army) to plan and conduct independent OTs, report results, and provide assessments and/or evaluations of operational effectiveness, operational suitability, and survivability (see DoDD 5000.01). The CG, ATEC will—

a. Plan, integrate, and conduct testing and evaluation required in support of the acquisition process and provide essential information to acquisition decision makers, commanders, PEOs, and other customers.

b. Develop the requirements and supporting methodologies for DT and OT instrumentation. Manage the sustainment of major instrumentation and non-major test instrumentation.

c. Research, develop, and acquire test facilities and capabilities and improve, develop, and promulgate new DT and OT methodologies.

d. Ensure integration of M&S in T&E to a feasible degree and conduct and/or support the verification, validation, and accreditation (VV&A) of all M&S used in T&E in accordance with DoD and Army policy.

e. Maintain a long-range plan for T&E resource requirements and provide input to the Army T&E Enterprise strategy.

f. Manage a database of Army major test facilities, major instrumentation, and test equipment. Program and budget for operations and modernization of test facilities.

g. Serve as a member of the Test Resource Advisory Group (TRAG) supporting the T&E Executive BOD.

h. Provide representation to the TEMAC and other T&E forums, as required (see chap 1).

i. Participate in program reviews, T&E WIPTs, supportability subgroups of the T&E WIPTs, and other working and review groups and in the development of requests for proposal, statements of work, and contract data requirements lists. In coordination with the T&E WIPT, provide input to parts II, III and IV of the TEMP for systems assigned for T&E.

j. Serve as the Army manager and resource coordinator for JT&E and participate in the nomination and selection of the Army joint test director or deputy test director for approval by DCS, G–8 (see para 3–11).

k. Develop and maintain programs in compliance with guidance from the AHRPO for testing that is determined to involve human subjects research (see AR 70–25).

l. Assist the Army T&E Executive in developing T&E policy.

m. Serve as chair and conduct the GO TSARC. Provide a chair for the CoC TSARC (see chap 9).

n. In support of DCS, G–3/5/7, manage and maintain the TSARC process, including the ADSS database.

o. Provide TSARC finalized TRPs optimally with 2 years notification prior to the resource date for units, and a minimum of 180 days notification prior to the resource date for Soldiers, Civilians, and other assets.

p. Identify OT requirements and develop prioritized solutions for Army T&E Executive approval and submission to OSD as part of the Army's Resource Enhancement Program.

q. Prepare Army input for the CTEIP.

r. Ensure compliance of all tests with all treaties and agreements that may be applicable to the T&E community.

s. Conduct or support simulations and the verification and validation of targets and threat representations.

t. As the CAPDEV for T&E threat forces, develop, and maintain the threat architecture and the threat T&E requirements determination process, oversee PM ITTS development, and submit the threat POM for targets and threat simulators (threat representations).

u. Serve as a voting member of the Army Threat Validation WG.

v. Provide the chair for the Threat Accreditation WG for all ATEC tests requiring a validated and accredited threat (see AR 381–11).

w. Ensure that the development of a system LFT&E strategy is in compliance with statute and DoD policy and notify DOT&E and the Army T&E Executive of all testing of personnel protection equipment (PPE) related to Soldier lethality and survivability.

x. In support of the disposition analysis of the Nonstandard Equipment AROC process, develop an operational utility assessment or an expeditionary OA.

y. Conduct predeployment and post-deployment assessments to ensure safety, technical applicability, and operational usefulness of nonstandard equipment and nonmateriel capabilities using the accelerated capabilities development process.

z. Conduct and chair OTRRs and combined DT/OT readiness reviews, as appropriate.

aa. Manage and execute the Army's LFT&E mission for assigned systems.

bb. Ensure that each system evaluator, tester, and logistician under CG, ATEC supervision complies with the responsibilities at appendix B.

cc. Provide subject matter expertise and advice to the Army Business Council on the testing and evaluation of Army DBSs (see AR 5–1).

dd. Brief the AROC and Army Systems Acquisition Review Council (ASARC) as required, on DT results of CEMA at Milestones B and C to ensure that software, hardware, and firmware development is secure to proceed to OT.

ee. Brief the AROC (at Milestone B) on test plans, cost, schedule, and test results (at Milestone C and FRP), including risk assessment of system testability, to inform requirement forum decisions.

ff. Brief the ASARC (at Milestone C and FRP) on test plans and test results, including risk assessment of system testability, to support milestone decisions and acquisition decision memorandums.

gg. Establish and maintain a searchable and secure repositories for storage of all planning/reporting documents and data in support of system evaluations. This includes documents and data provided by the Army T&E enterprise (see para 1–5*l*). Documents will be stored within 30 days of final signature or approval. Data will be stored within 90 days of event completion.

hh. By means of the AEC, will—

(1) Perform the duties of an independent system evaluator for all Army systems except for the systems assigned for evaluation to MEDCOM, INSCOM, USASMDC/ARSTRAT, and USACE.

(2) As designated by the PM for each MDAP, serve as the lead DT&E organization (see DoDI 5000.02).

(3) Provide a safety release before the start of training, testing, maintenance, or demonstrations that use Soldiers as participants (see AR 385–10).

(4) Provide safety confirmations for milestone and materiel release decision reviews, fielding, and equipping.

(5) Provide data to ASA (ALT) to perform the IPS program surveillance for Army systems, perform independent logistics supportability assessments and report them to the Army Logistician and other interested members of the acquisition community. Oversee and evaluate the logistics aspects of system acquisition and modification programs and deployed systems to ensure supportability.

(6) When there is a requirement, plan for threat offensive cyberspace operations to be an integral component of all OTs governed by the threat TSP.

(7) Serve as the co-lead with AMSAA for the Army's Center for Reliability Growth.

(8) Manage Survivability T&E of systems operating in the cyber electromagnetic environment by chairing the CEMA survivability subgroup to the T&E WIPT. Ensure the CEMA survivability T&E strategy in an approved TEMP is in compliance with statute and DoD policy.

(9) In coordination with the MATDEV/PM, conduct periodic cybersecurity risk assessments to determine the appropriate Blue, Green, and/or Red Team and to determine operational impact tests in alignment with the overall test strategy for evaluating the program for real world effects. DBSs will undergo theft/fraud operational impact testing.

(10) Consult with the PM ITTS Threat System Management Office, TRADOC, DCS, G–2, and ARL and/or SLAD to identify the composition of threat offensive cyberspace operations teams, penetration teams, vulnerability analysis teams, and PDRR teams.

(11) Assist the CAPDEV and/or Office of Business Transformation in the requirements development process by providing T&E expertise and experiences in the review of draft capability requirements documents and/or DBS Problem Statements prior to formal staffing.

(12) Upon AMSAA request, provide data to support development of system performance estimates, weaponeering estimates, and collateral damage estimates.

ii. By means of the U.S. Army Operational Test Command, will—

(1) Perform the duties of operational tester for all Army systems except those assigned to MEDCOM, INSCOM, USASMDC/ARSTRAT, USASOC, and USACE for operational testing.

(2) Perform the duties of operational tester for joint tests; multi-Service tests; force development test and/or experimentation; customer tests (CTs); Joint, integrated, or combined DT/OTs; urgent materiel releases, and accelerated acquisition initiatives.

(3) Conduct and report test results from ATDs, advanced warfighting experiments, and joint capability technology demonstrations (JCTDs) when requested by the demonstration manager or TRADOC–ARCIC.

jj. By means of the ATEC Test Centers will—

(1) Perform the duties of government developmental tester for Army systems and multi-Service systems when the Army is designated the Lead Service, except systems assigned to CECOM (by CIO/G–6), MEDCOM, INSCOM, USASMDC/ARSTRAT, and USACE for developmental testing.

(2) On an 'as available' basis, provide test facilities and testing expertise on a cost reimbursable basis in support of the acquisition of Army and other defense systems and other customers (such as other federal agencies, state, and local governments, foreign and allied governments, and private industry).

(3) Operate and maintain the Army's portion of the MRTFB (except for the U.S. Army Ronald Reagan Ballistic Missile Defense Test Site (U.S. Army Kwajalein Atoll)) in accordance with DoDD 3200.11.

(4) Ensure compliance of all ATEC tests with the National Environmental Policy Act (NEPA) and that environmental considerations are addressed in accordance with AR 200–1 and Title 32, Part 651 of the Code of Federal Regulations (CFR).

(5) Manage the Army Test Incident and Reporting System (ATIRS).

(6) Provide CEMA vulnerability assessments and/or penetration testing support to ARL/SLAD as needed.

2–19. Commanding General, U.S. Army Cyber Command and Second Army

The CG, ARCYBER and Second Army will–

a. Provide a member to the GO and CoC TSARC (see chap 9).

b. Support services in accordance with current DoD and Army policy.

2–20. Commanding General, Military Surface Deployment and Distribution Command

The CG, MSDDC will—

a. Manage the Army portion of the DoD Engineering for Transportability Program (see AR 10–87).

b. Review and analyze the transportability and engineering aspects of test related documents.

c. Ensure that appropriate transportability testing is planned, conducted, and reported by the MATDEV.

d. Provide a transportability assessment to the MATDEV and to the ATEC.

e. Provide transportability functional expertise in the planning and conduct of T&E, including M&S support.

f. Participate in the GO and CoC TSARC, as required (see chap 9).

2–21. Commanding General, U.S. Army Pacific

The CG, USAPAC will provide a member to the GO and CoC TSARC (see chap 9).

2–22. Commanding General, National Guard Bureau, Army National Guard

The CG, NGB, ARNG will provide a member to the GO and CoC TSARC (see chap 9).

2–23. Commanding General, Office of the Chief Army Reserve

The CG, OCAR will provide a member to the GO and CoC TSARC (see chap 9).

Chapter 3
Test and Evaluation in Support of Systems Acquisition and Development

3–1. Introduction

a. The primary purpose of T&E is to support systems development and acquisition. Army T&E provides information to—

(1) Decision makers responsible for procuring effective, suitable, and survivable systems.

(2) CAPDEVs for the purpose of refining/modifying requirements and developing DOTMLPF–P products and organizations.

(3) MATDEVs, so they can identify and resolve technical and logistical issues pertaining to performance and risk.

(4) Trainers, so they can identify the initial required institutional training loads, the unit training time burden, the training retention time leading to required retraining cycles, the training space and consumables burdens, and training needs to meet readiness status.

(5) Personnel proponents and CAPDEVs, so they can identify required personnel qualifications.

(6) Logisticians, so they can identify the total support personnel and support equipment required to meet readiness goals, the required spares and supply support, and stockpile reliability and inventory management.

b. T&E strategies will integrate all testing and M&S activities as an efficient continuum. Developmental testers and operational testers, in concert with a system evaluator, assist MATDEVs and CAPDEVs in developing integrated T&E strategies that optimize the use of all testing, M&S, and other credible events as appropriate to the specific program.

c. The Army conducts T&E to demonstrate the feasibility of conceptual approaches, evaluate risks, identify alternatives, and compare and analyze tradeoffs toward an iterative process so as to verify the achievement of CTPs and answer the COIs and/or COIC. The iterative process of testing changes as a system maturity evolves. As the system approaches the FRP/FD decision review, emphasis shifts to attainment of documented thresholds and objectives by a production representative system when employed by typical user personnel under realistic field conditions that depict the expected operational environment.

d. M&S are integrated with T&E to improve the acquisition process and reduce acquisition cycle times. M&S provide predictions of system performance and effectiveness while tests provide empirical data to validate M&S. M&S that utilizes or portrays threat characteristics or parameters must have that portrayal accredited by the Defense Intelligence Agency. Every distinct use of a model or simulation in support of an operational system assessment/evaluation will be accredited by ATEC and for programs under DOT&E oversight use for the operational system evaluation will be approved by DOT&E. This is referred to as the model-test-model process. Tests also support assessment

and/or evaluation of system maturity and conformance with performance specifications to determine a system's operational effectiveness, operational suitability, and survivability. The goal of testing is to learn about the capabilities and limitations (C&L) of a system. A system assessment and/or evaluation is the means to understand a system's military utility.

e. The iterative use of system M&S and tests support the overall incremental design and development of a system. Testing assists in validating system models, which are then immersed into synthetic environments to predict system performance under conditions that are not (or cannot be) tested to support the decision making process. System models that are tested should be the same as (or traceable to) the models used for concept development, analysis of alternatives, system design, and production. Synthetic test environments may also be reused for training, operations planning and rehearsal, and subsequent concept developments.

f. CE is a process that provides a steady flow of evaluation information to the CAPDEV and MATDEV on a proposed acquisition of a system, even as the acquisition evolves from a laboratory or experiment to an identified and recognized program (or project) of record. CE is conducted by ATEC, will be employed on all acquisition programs, and can be comprised of system, subsystem, and component testing. CE is a strategy that ensures responsible, timely, and effective assessments of the status of a system's performance throughout its acquisition process. CE can begin as early as the materiel solution analysis phase and continues through system post-deployment activities. The CE process includes EOA reports, OA reports, and SERs.

g. A system assessment and system evaluation focus on issues of a system's technical and operational characteristics, performance, and safety as a part of system operational effectiveness, operational suitability, and survivability. EOA reports, OA reports, and SERs focus on the ability of the system to accomplish its mission in its intended operational environment and is provided to the MDA at Milestone B and Milestone C, and at the FRP/FD decision review, respectively.

h. An integrated methodology using data from experimentation, demonstration, M&S, and T&E will be used to provide the maximum benefits from a complete, unified T&E program by efficiently using resources to minimize acquisition cycle time. This integrated methodology will reduce the multiple and redundant products and processes, which in concert with DoD guidance, encompasses the development of a single integrated SEP. The SEP (prepared by ATEC using their specified format), includes a single integrated test and/or simulation execution strategy that leads to a single EOA report, OA report, and SER. The Army T&E community will consider contractor test results (especially when conducted in the presence of Army test experts and professionals) to support system evaluation and expand the use of M&S to aid in achieving the goals of reducing T&E cost, increasing T&E efficiencies, and reducing program cycle times. The following processes will apply:

(1) Army T&E for systems will be structured to integrate all T&E activities as an efficient continuum. M&S will be an integral part of T&E planning and will be used to reduce time, resources, and T&E-related risks involved. The integrated test and/or simulation strategy can include separate DT and OT, combined DT/OT, integrated DT/OT, M&S, and other sources that generate credible data.

(2) Verified, validated, and accredited M&S will be applied, as appropriate, through the system life cycle to support efficient test planning and to supplement T&E.

(3) A system's approved TEMP will provide a roadmap for integrated M&S, T&E plans, schedules, and resource requirements necessary to accomplish the T&E program. For integrated testing to be successful, it is important that the pedigree of the data be understood and maintained. The pedigree of the data refers to accurately documenting the configuration of the test asset and the actual test conditions under which each element of test data was obtained. The T&E WIPT plays an important role in maintaining the data pedigree for a program within the integrated test process. The T&E WIPT establishes agreements among the test program stakeholders regarding roles and responsibilities in implementing the integrated test process in developing and maintaining data/report release procedures, and in data access procedures (or a data repository) where all stakeholders will have access to test data for separate assessments and evaluations.

(4) System evaluators and testers will participate in experimentation and technology demonstration processes, as appropriate, to maximize the use of available data in the development of system assessments and system evaluations. The intent is to save the Army from procuring the same data twice thus reducing overall test resource requirements.

i. Planning, programming, and budgeting for T&E must begin early in the system life cycle management process. The approved TEMP must reflect T&E cost funding by appropriation, amount, and budget year of the planning, programming, budgeting, and execution system (see chap 11).

j. The development, approval, and execution of the system's approved TEMP provides the key internal controls for T&E in support of the acquisition process. Major provisions in the approved TEMP become key internal controls once TEMP execution has begun (see app C).

3–2. Test and evaluation relationship to the life cycle model

a. DoDI 5000.02 describes the phases, acquisition milestones, and descriptions of life cycle activities for the acquisition life cycle model for all acquisition systems. Implementation of DoDI 5000.02 requires the conduct of T&E as prescribed herein. T&E will be tailored to accommodate the unique characteristics and schedule of each acquisition program. The T&E WIPT tailors T&E tools and strategy to maximize effectiveness and efficiency.

b. Incremental acquisition strategies define, develop, and produce/deploy an initial, military useful capability (Increment 1) based upon proven technology, time-phased requirements, projected threat assessments, and demonstrated manufacturing capabilities. Incremental acquisition provides for subsequent development, production, and/or deployment of increments beyond the initial capability over time (Increments 2, 3, and beyond). Each of these increments must be tested and evaluated to support design and development as well as "go" and/or "no-go" decision-making. The approved TEMP will be part of program planning activities and will require an update and approval for each increment. The T&E WIPT must determine which tests are required to support independent system assessments or system evaluations. Statutory T&E requirements and guidelines apply.

c. Whenever practical, hardware-in-the-loop simulation should be used to assist in identifying deficiencies prior to them being discovered in either DT or OT.

d. DT will be conducted to assess achievement of CTPs, to identify technological and design risks, to demonstrate early engineering and manufacturing development phase reliability test threshold value for other than IT programs that include no hardware procurement or development, and to determine readiness to proceed to the initial operational test (IOT).

e. If the early engineering and manufacturing development phase reliability test threshold is not demonstrated during the full-up system DT established by the system T&E WIPT's RAM Subgroup, an in-process review, led by ATEC, will be convened. Topics to be addressed include the PM's planning and implementation of corrective actions, projected reliability as corrective actions are implemented, and programmatic impacts, if any. ATEC will develop a reliability risk assessment based on the PM's corrective actions plan, the system's current and projected reliability, and risk of the program not getting back on track. ATEC, in coordination with the PM, will also estimate ownership cost impacts of the current and projected reliabilities.

f. OT will be conducted to provide data for EOA reports, OA reports, and SERs, with the IOT being conducted to determine operational effectiveness, operational suitability, and survivability of the system under realistic operational conditions.

g. The MATDEV will ensure that appropriate testing is planned, coordinated, and executed to provide the independent system evaluator the data necessary to develop EOA and OA reports supporting the acquisition life cycle model.

h. The SER will document a system's operational effectiveness, operational suitability, and survivability. The SER addresses the ability of the system to facilitate the closing of operational capability gaps or to take advantage of new opportunities (as generally identified in the COIs) within the operational context of personnel, unit, environment, interdependencies, and threat ability to counter the value of the new system. The SER applies to all systems regardless of ACAT level—to include commercial, off-the-shelf, NDIs, product improvements or preplanned product improvements of legacy systems, and engineering change proposals.

3–3. Test and evaluation relationship with the National Environmental Policy Act

32 CFR Part 651 sets forth the Army's policies and responsibilities for the early integration of environmental considerations into planning and decision making. This federal regulation mandates environmental analysis of Army actions affecting human health and the environment; provides criteria and guidance on actions normally requiring environmental assessments or environmental impact statements, and lists Army actions that are categorically excluded from such requirements when stating specific criteria are met. PEOs will implement environmental reviews in coordination with test organizations. MATDEVs will submit existing program NEPA documentation to test organizations with the firm test request. Not later than 120 days prior to the test, the MATDEV will coordinate with the test organization to determine the appropriate level, scope, and schedule for completing site-specific NEPA documentation required for the test. Not later than 30 days prior to the test, the DT and OT test organizations will verify that the MATDEV has completed and submitted adequate NEPA documentation for consideration by the test decision maker as required by 32 CFR Part 651. DT and OT test organizations will ensure compliance with the NEPA requirements and that properly prepared NEPA documentation has been signed, approved, and received in accordance with 32 CFR Part 651. The test will not proceed unless adequate NEPA documentation has been received, considered, and included in the test file prior to the test.

3–4. Test and evaluation in support of personnel protection equipment

For realistic survivability testing, 10 USC 2366 defines the term "covered system" as "a vehicle, weapon platform, or conventional weapon system that includes features designed to provide some degree of protection to users in combat…." DoDI 5000.02 requires the PM to assess risks to personnel and address, in terms of system design, protection from direct threat events and accidents (such as chemical, biological, and nuclear threats). Design consideration will include primary and secondary effects from these events and consider any special equipment necessary for egress and survivability. For items considered as PPE such as body armor, combat helmets, and the chemical protective ensemble, ATEC will conduct all first article tests (FATs) and lot acceptance test (LATs). If the Army's PPE requirements exceed the capacity of ATEC to conduct the testing, ATEC will contract the work to independent certified testing facilities. ATEC will manage any necessary contracting action and exercise oversight of the testing.

a. In addition to conducting all FATs, ATEC, in coordination with the MATDEV, will define, develop, and maintain test standards and protocols.

b. PPE ballistics testing accomplished at National Institute of Justice approved independent laboratories is restricted to LATs and will use Army established standards and protocols. Certified National Institute of Justice LAT testing will be limited to the specific type of certification granted.

c. Government test subject matter experts validated by ATEC will provide on-site oversight of PPE tests so as to ensure adherence to government test standards and protocols.

d. ATEC will conduct periodic LAT testing as an additional confidence measure in the last line of Soldier protection.

e. Once acceptable performance has been established by government test, regular LATs will be conducted to maintain the established baseline.

f. The determining authority for whether a system is considered PPE is the DUSA.

3–5. Test and evaluation in support of system changes

a. System changes to deployed systems can be accomplished via recapitalization, technology refreshment, or other improvements (such as modernization or modification) that are not part of an increment acquisition strategy and/or DBS Problem Statement. An Army recapitalization strategy can follow two paths: a rebuild or a selected-upgrade-program. Continuous technology refreshment is the intentional, incremental insertion of newer technology into existing systems to improve reliability, maintainability, or reduce cost—typically in conjunction with normal maintenance (see AR 70–1).

b. System changes (such as modifications and upgrades) to a legacy system must be adequately tested and evaluated. A modification is a change to a system that is still in production consisting of an alteration, conversion, or modernization of an end item or component of investment equipment that changes or improves the original purpose or operational capacity in relation to effectiveness, efficiency, reliability, or safety of that item. An upgrade is a change to a system that is out of production. Such changes can be improvements to system capabilities or fixes to correct deficiencies.

c. The integrated T&E strategy developed for a given system change will depend on the operational impact of the change. When the system change is a new or revised requirement, preplanned product improvement, or when the CAPDEV determines the system change to have (or have significant potential for) operational impact, then the level of the integrated T&E will be determined by the T&E WIPT (see chap 8).

d. If a system change does not have operational impact, the PM (or procuring command when a PM office does not exist) will determine the actions necessary to support the decision to apply the system change. In all cases, the level of the evaluation that is required to address the impact of the change will determine the necessary testing. In particular, for computer resources (software, hardware, or firmware), the proportion of system change and the criticality of affected computer software units must be considered.

e. If a system change compromises the baseline or causes an operational impact to the system, to include the user's operation or maintenance of the system, the previously approved system TEMP will be updated (see para 10–2*c*(1)).

3–6. Test and evaluation of commercial items and nondevelopmental items

All commercial items and NDI programs must establish a T&E WIPT and have an approved TEMP that will adhere to the policies and procedures for new acquisition T&E programs. MATDEVs, CAPDEVs, and system evaluators will make maximum use of prior test data and information (including information from commercial manufacturers, users, other Services, agencies, or countries) in support of required T&E of commercial items and/or NDI. The results of market research may be used to satisfy some evaluation requirements. Market research supporting commercial items and/or NDI acquisition (including reprocurements) may include testing and experimentation when determined necessary.

3–7. Test and evaluation in support of reprocurements

Reprocurement of an item is authorized when a continuing need has been identified and validated by the CAPDEV (or force modernization proponent). T&E requirements for reprocurements vary depending on whether the reprocurement is for a commercial item, for NDI, for government controlled technical data within the technical data rights strategy, for an item from a different contractor than the original equipment manufacturer, or for an item with a significant break in production (more than 2 years). The following applies to systems procured under AR 70–1:

a. Reprocurements to a current military technical data/technical data rights strategy require only the appropriate DT determined by the PM (or procuring agency when a PM office does not exist) to verify production compliance with the specifications. If either the MATDEV or CAPDEV introduces system modifications or upgrades relating to the current military technical data/technical data rights strategy, the system modifications or upgrades will be treated as system changes and the T&E requirements, as described in paragraph 3–5, will apply.

b. Reprocurement of a commercial item (off-the-shelf or Army modification of the off-the-shelf) or NDI to a current performance specification from the original equipment manufacturer (make and model) without significant break in production (more than 2 years) normally requires only the appropriate DT (as determined by the procuring agency and the CAPDEV) to verify production compliance with the specifications.

c. Reprocurement of a commercial item (off-the-shelf or modified off-the-shelf) or NDI requires appropriate testing if—

(1) A current performance specification from a contractor is different than the original equipment manufacturer's performance specification (that is, it is a different make).

(2) The original equipment manufacturer intends to field a different model.

(3) A performance specification is modified or upgraded by the MATDEV or CAPDEV. This determination will be made by the procuring agency, in coordination with the T&E WIPT principals (see chap 8), to ensure production compliance with the specification and to determine the need for additional DT or OT.

d. System EOA reports, OA reports, and SERs are always required to assist the MDA in determining whether to authorize a reprocurement when there has been a significant break in production. If market research reveals that an item previously procured is no longer available, has significant configuration changes, or has technology advances that have occurred, then a new acquisition strategy and/or DBS Problem Statement and associated system EOA reports, OA reports, and SERs are required.

3–8. Test and evaluation in support of science and technology development and transition

JCTD and ATD efforts of the Services and defense agencies assist in accelerating the maturation of advanced technologies and assessing their military utility. Some science and technology programs like JCTDs, selected prototype projects, and operationally validated quick reaction technology projects can transition into the acquisition process. Technologies will transition only when they have matured, been thoroughly demonstrated, and been proven to have military utility. Prior to the commencement of operational testing, the system should have reached a technology readiness level (TRL) of 6 (see the Technology Readiness Assessment Guidebook). As they are rough benchmarks on technology risk, TRLs are not conclusive as to the degree of risk mitigation needed prior to development. Deeper analysis of the actual risks associated with the preferred design and any recommended risk mitigation must be conducted and provided to the MDA. When a technology is transitioned to an acquisition program of record, T&E is required. Technological advances in the form of system changes (that is, modifications or upgrades) to existing systems will be tested and evaluated as discussed in paragraph 3–5. Life cycle activities for new development of technologies are contained in the Defense Acquisition Guidebook.

3–9. Test and evaluation to support materiel release

System OA reports, conducted by the system evaluator (including the safety confirmation), will support materiel release actions for new procurement, reprocurements, and system changes.

3–10. Test and evaluation of multi-Service acquisition programs

a. T&E of multi-Service acquisition programs are conducted on systems that are being acquired by more than one DoD component. T&E planning, execution, and report writing are done by agreement among the participating Services, including sources of funding and designation of the Lead Service. The Lead Service prepares and coordinates a single TEMP, a single test design plan, and a single T&E report reflecting system technical performance and operational effectiveness, operational suitability, and survivability for each Service that is involved. Testing procedures follow those of the Lead Service, with variation as required, and are resolved through mutual agreements (see the Defense Acquisition Guidebook).

b. The MOA on MOT&E and Operational Suitability Terminology and Definitions provides the basic framework and guidelines for planning, conducting, evaluating, funding, resourcing (through coordination with the TSARC and the other Services' established processes), and reporting these programs. ATEC is the Army proponent for the MOT&E MOA, and it is reviewed and updated periodically. The lead Service role is rotated among the Services.

3–11. Test and evaluation in support of the Joint Test and Evaluation Program

a. OSD's DOT&E sponsors the JT&E Program (see DoDI 5010.41). JT&E provides quantitative operational test and evaluation (OT&E) information used for analyzing joint military capabilities and develops potential options for increasing military effectiveness. JT&E complements the acquisition process under DoDD 5000.01 by bringing two or more military departments or other components together to:

(1) Assess Service interoperability in joint operations and explore potential solutions to identified problems.
(2) Evaluate joint technical and operational concepts and recommend improvements.
(3) Increase joint mission capability using quantitative data for analysis.
(4) Validate operational testing methodologies that have joint applications.
(5) Improve M&S validity with field exercise data.
(6) Provide feedback to the acquisition and joint operations communities.
(7) Improve Joint TTPs.

b. The DCS, G–8 (DAPR–FD) coordinates all JT&E issues with the Army Staff and is responsible for the Army's participation and execution of the JT&E Program. DAPR–FD issues the call for Army nominations and conducts an Army board that reviews, coordinates, approves, and prioritizes those nominations that are forwarded to OSD for consideration. The Army T&E Executive is an advisor to DAPR–FD, makes recommendations on concepts and nominations to become JT&E, and has oversight authority on the conduct of all JT&Es. ATEC maintains and manages the Army's table of distribution and allowances for JT&Es, ensures proper administration of Army JT&E personnel, and programs Army resources for all JT&Es.

c. ATEC provides Army resources for the joint test forces and coordinates resource requirements to support the conduct of JT&E, to include chartered phases (see para 2–18*j*). JT&E participants notify ATEC and coordinate all resources (including operational assets) through the TSARC process early in the JT&E process. Commands and agencies with expertise in test planning, development, and execution must support ATEC as appropriate.

d. Army organizations or commands submitting JT&E nominations are required to provide an O6-level Joint Feasibility Study Director, administrative support, and adequate facilities to house the Feasibility Study for one year should the nomination be selected. For Army-lead chartered JT&E, ATEC provides funding for administrative and facilities support.

3–12. Test and evaluation in support of nonstandard equipment

The AROC is the authority for determining the disposition of solutions to urgent and emergent operational needs. The Nonstandard Equipment AROC evaluates assets as potential enduring capabilities for the Army (it satisfies and/or mitigates a recognized capability gap, has broad applicability across the Army, and supports capability development initiatives). Nonstandard equipment is defined as equipment that has not been type-classified, is not an acquisition program or component of a program, and typically has been procured to support an urgent or emergent operational need. The Nonstandard Equipment AROC's mission is to retain the most capable and cost-effective capability solutions that meet urgent/emergent operational needs or enduring capability requirements. If the Nonstandard Equipment AROC determines that nonstandard equipment provides a solution to a needed, enduring capability, the nonstandard equipment may transition to a program of record which is supported by a "Transition to Program of Record" recommendation by the lead CAPDEV and/or TRADOC Center of Excellence. An ATEC-developed expeditionary OA is a required element for the "Transition to Program of Record" recommendation. If an expeditionary OA is not conducted, then the Nonstandard Equipment AROC recommendation will be either to "Sustain for Current Contingency or Near-Term Threats" or "Termination." The Nonstandard Equipment AROC Memorandum will specify the capability requirements documents required to support transition to a new or existing program of record, method of sustainment, and disposition of materiel until the capability requirements document is approved and the program is funded.

3–13. Test and evaluation in support of accelerated (rapid) acquisition

An accelerated acquisition and/or rapid process applies when the urgent needs schedule considerations dominate over cost and technical risk considerations. Each compresses or eliminates phases of the acquisition process and accepts the potential for inefficiencies in order to achieve a fielded capability on a compressed schedule. Being time hypersensitive, unnecessary or avoidable delays of any kind will negatively impact the accelerated acquisition process. For accelerated acquisition projects, ATEC develops and provides decision makers and Soldiers with a C&L report, which

provides essential information to assist them in making an informed decision regarding equipping, employment, and potential future acquisition decisions. An ATEC safety confirmation is provided concurrently with the C&L report. The primary customers of the C&L Report are combatant commanders, users of accelerated acquisition equipment, and the Army acquisition community. A TRP submitted to the TSARC is required for any accelerated acquisition test needing operational assets from Army agencies and/or organizations. The levels of developmental testing required will be highly tailored to emphasize schedule over other considerations. Required testing to verify safety, capabilities, and limitations will be performed in consistency with the level of urgency of fielding the capability. Responsibility for determining developmental testing requirements will be delegated to the lowest practical level. Urgent needs acquisition programs will generally not be on an OSD DT&E program engagement list. If an accelerated and/or rapid acquisition program is on the OSD DT&E program engagement list, complete developmental testing may be deferred so as not to impede early fielding; however, an OA will typically be conducted. DCS, G–3/5/7, through the quick reaction capability process, will nominate the program for assessment utilizing the Army Requirements and Resourcing Board. Once approval is given, ATEC will plan and conduct an OA, as well as report the results to the board and to the requesting sponsor.

3–14. Test and evaluation in support of agile capabilities life cycle process

The agile capabilities life cycle process is designed to change the way the Army develops, acquires, and fields network and some non-network capabilities. The objective is to improve efficiency and effectiveness, thereby reducing the amount of time and resources necessary to respond to requirements associated with current operations, emergent technology, and modifications to the Army Force Structure. Success hinges on the network integration exercises and on the follow-on implementation plan for recommended candidates, with each consisting of phases that start with the continuous identification of capability gaps and requirements and with candidate capability solutions. Each network integration evaluation is designed to integrate and mature the Army's tactical network; conduct OTs of select Army programs of record; and evaluate emerging network and non-network capabilities in an operational environment. The agile capabilities life cycle process does not replace nor circumvent the DoD 5000 Series, the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 5123 series, AR 70–1, or AR 71–9.

3–15. Test and evaluation in support of cyber electromagnetic activities survivability

a. PMs must ensure that CEMA survivability is fully integrated into all phases of acquisition. All mission critical and mission essential systems will have an appropriate CEMA survivability T&E strategy that must be incorporated into the approved TEMP in support of all acquisition milestone decisions, program decisions, and acquisition contract awards.

b. CEMA events will be aligned with existing OSD cybersecurity directives and procedures. Joint and Army doctrine and policy closely link cyberspace operations, spectrum management operations, and electronic warfare. Therefore, for Army systems, the planning and execution of cybersecurity T&E will be aligned with FM 3–12.

c. The CEMA survivability T&E strategy, as reflected in the approved system TEMP, will identify test synchronization opportunities where cybersecurity and electronic protection will be considered. CEMA survivability T&E must be accomplished in a series of building-block events starting in DT and culminating in the IOT. The intent of progressive CEMA testing is to allow deficiencies to be identified and corrected before the FRP/FD decision. IOT will be conducted in a realistic end-to-end environment in order to identify issues caused by SoS interactions. As such, the IOT must be conducted with military end-users and system/network administrators.

d. If testing for CEMA survivability in an operational environment is deemed to incur unacceptable operational risks, alternative evaluation strategies will be documented in the approved TEMP, as well as in the OT TRPs and TDPs.

3–16. Test and evaluation of offensive cyberspace operations

a. All DoD-owned or DoD-controlled offensive cyberspace operations weapons and capabilities will undergo a TAS evaluation (see DoDI O–3600.03).

b. PMs and organizations developing, modifying, or sponsoring offensive cyberspace operations capabilities will incorporate TAS evaluations into their development and life cycle management processes.

c. Offensive cyberspace operations capabilities include the following:

(1) Techniques, hardware, firmware, or software used to conduct offensive cyberspace operations.

(2) Platforms from which offensive cyberspace operations are executed.

(3) Procedures integral to the conduct of offensive cyberspace operations, including cyberspace operational preparation of the environment and dual-use technologies used for military operations.

3–17. Foreign comparative testing

a. Foreign comparative testing involves the T&E of North Atlantic Treaty Organization (NATO) and non-NATO allies' defense equipment to determine whether such equipment meets valid existing DoD needs.

b. The foreign comparative testing program was implemented in response to a growing awareness of the value of using NDIs to accelerate the acquisition process and reduce rising development costs. The primary objective of the foreign comparative testing program is to leverage NDIs of allied and friendly nations to satisfy DoD component requirements or correct mission area shortcomings. The foreign comparative testing program reduces duplication in research and development and can provide cost or performance advantages over traditional acquisition programs. The foreign comparative testing process is dependent on a developed foreign item, user interest, a valid requirement, good procurement potential, and a successful evaluation. 10 USC 2350a legislates and authorizes the foreign comparative testing program. Guidance is available in the DoD Federal Acquisition Regulation (FAR) supplement, the Defense Acquisition Guidebook, and AR 70–41.

3–18. Test and evaluation of radiation protection factor

Radiation protection factor is a quantitative indicator of the ability of a vehicle and shelter to shield its occupants from penetrating nuclear radiation. Commanders at all levels need knowledge of the radiation protection factor to plan for and manage crew risks while operating in radiological-contaminated operational environments. The protection factors are required for all manned combat vehicles and shelters (as identified in the CBRN survivability criteria) in support of the CDD. Accordingly, the protection factor will be measured, recorded, and reported during testing of all combat vehicles and shelters, particularly for those identified as mission critical.

Chapter 4
Developmental Testing

4–1. Introduction

Although DT and OT are discussed in separate chapters in this regulation, as discussed in paragraph 3–1*h*, T&E programs will be structured as an efficient, integrated continuum that obtains necessary, validated data from many sources. The efficient, integrated continuum constitutes a process that will be used to provide the maximum benefits from a complete, unified T&E program by efficiently using resources to decrease acquisition cycle time. DT&E provides feedback to the PM on the progress of the design process and on the product's compliance with contractual requirements. DT&E also evaluates the ability of the system to provide effective combat capability (including its ability to meet its validated and derived capability requirements and the verification of the ability of the system to achieve KPPs and KSAs) and that initial system production, OT&E, and deployment can be supported. This effort requires completion of DT&E activities consistent with the approved TEMP. For MDAPs, the PM has a statutory requirement to notify the USD (AT&L) (who will notify Congress) not later than 30 days after any decision is made when a lead DT&E Organization is to conduct any DT for the MDAP without an approved TEMP. The notification must include a written explanation of the basis for the decision and a timeline for getting an approved TEMP. A copy of the notification will be provided to DOT&E (see DoDI 5000.02, table 6). Each major DT phase or test (including test readiness reviews) will have test entrance and exit criteria. The DT completion criteria (customer needs) will dictate what data are required from the DT. Scientific test and analysis techniques will be used to design an effective and efficient test program that will produce the required data to characterize system behavior across an appropriately selected set of factors and conditions. Demonstration that the production design is stable and will meet stated and derived requirements will be based on acceptable performance in DT. Key DT&E activities include detecting cyber vulnerabilities (within custom and commodity hardware and software while supporting cybersecurity assessments and authorization) and risk management framework security controls. Successful completion of adequate testing with production and/or deployment representative prototype test articles normally will be the primary basis for entering LRIP or limited deployment. The various types of Army T&E support listed in chapter 3 will use some combination of the tests listed in paragraph 4–2 to achieve their goals. The process envisions the development of a single integrated test/simulation execution strategy that leads to an EOA reports, OA reports, and a SER (see chap 10).

4–2. Types of developmental tests

DT is a generic term that encompasses M&S and engineering-type tests that are used to verify that design risks are minimized, that safety of the system is verified, that achievement of system technical performance is substantiated, and that readiness for OT&E is certified. A PM uses DT&E activities to manage and mitigate risks during development, to inform decision makers throughout a program's life cycle, and to verify that the program is compliant with

contractual and operational requirements. DT&E provides knowledge to systems engineers and decision makers so they can measure progress, identify problems in order to characterize system C&L, and manage technical and programmatic risks. DT&E results are also used as the basis for contract incentives and to ensure adequate progress prior to investment commitments or initiation of phases of the program. The initial production decision is usually based on DT results along with early OT (the early user test (EUT) and the limited user test (LUT)) results. Both provide evidence that the product design is stable, since the commitment to enter production is very difficult and expensive to reverse. Key DT characteristics are as follows:

a. Generally requires instrumentation and measurements.

b. Normally, accomplished by engineers and technicians.

c. Is repeatable.

d. May be environmentally controlled.

e. Covers the complete spectrum of system capabilities to the extent practical and affordable.

f. Designed to identify design deficiencies.

g. Used to conduct root cause analysis.

h. Implements corrective actions.

i. Promotes and assesses reliability growth.

j. Evaluates adequacy of design for logistical support.

k. Estimates the effect of anticipated field utilization and environmental conditions (operationally-realistic loads and stresses).

l. Determines contract compliance and resolve contractual RAM issues.

m. Provides a basis for a clear understanding of reliability and maintainability design deficiencies.

n. Provides estimates of RAM characteristics (see AR 702–19).DT types are listed below and should be selected from this list with the objective of building an efficient and effective test and/or simulation execution strategy that integrates testing to support a given program in accordance with paragraph 1–5. Software intensive systems may undergo specialized testing (see paras 4–2*o*(6), 4–2*o*(7), 4–2*o*(8), 4–2*p*(7), and 4–2*p*(10)).

o. Pre-FRP/FD Common to all hardware and software-intensive systems:

(1) Market research effort (or proof of concept test).

(2) Technical feasibility test (TFT).

(3) Engineering development test (EDT).

(4) Production prove-out test (PPT).

(5) Production qualification Test (PQT).

(6) Software development test (SDT).

(7) Software qualification test (SQT).

(8) Interoperability certification test.

(9) CEMA survivability test and analyses.

(10) LFT (part of realistic survivability and realistic lethality).

(11) Soldier protection testing.

(12) LD.

(13) Physical configuration audit (PCA).

(14) Functional configuration audit (FCA).

p. Post-FRP/FD Common to all hardware and software-intensive systems:

(1) Production verification test (PVT).

(2) FAT.

(3) Comparison test.

(4) LFT, if required for product improvements of covered systems.

(5) Quality conformance (acceptance) inspection.

(6) LAT.

(7) Tests in support of post-deployment software support (PDSS).

(8) Surveillance test.

(9) Reconditioning test.

(10) Regression test.

4–3. Pre-full-rate production and/or full deployment testing—common to all hardware and software-intensive systems

The types of DT conducted prior to FRP/FD are as follows:

a. Market research effort or test (proof of concept). A market research effort or proof of concept test is conducted during pre-systems acquisition to determine early technical characteristics, to support the research of these items, and to provide fundamental knowledge for solutions of identified military capability gaps. These efforts typically include science and technology development test programs that are focused on long-term basic research (budget activity 6.1) and midterm applied research (budget activity 6.2).

b. Technical feasibility test. A TFT is a DT typically conducted during either the materiel solution analysis phase and/or technology maturation or risk reduction phase to provide data to assist in determining safety and health hazards and in establishing system performance specifications and feasibility of alternative concepts. Testing in accordance with the intended government duty cycle (as derived from the OMS/MP) during these acquisition phases identifies and reduces risks in subsequent acquisition phases and provides data for the EOA in support of Milestone B.

c. Engineering development test. An EDT is a DT typically conducted during the engineering and manufacturing development phase to provide data on performance, RAM, safety, CBRN survivability, ballistics, computer network defense (CND), electromagnetic environment survivability, CTPs, refinement and ruggedization of hardware configurations, and determination of technical risks. The EDT includes the testing of compatibility and interoperability with existing or planned equipment and systems, and the effects caused by natural and induced environmental conditions. EDTs may also include short-term advanced research technology development efforts (budget activity 6.3). The short-term development efforts are designed to support current force needs with the goal of spiraling or inserting the technology into the current force.

d. Production prove-out test. A PPT is a prior to production DT conducted prior to production with prototype hardware to determine the most appropriate design alternative. The PPT is usually performed at the system and subsystem level and provides data on safety, reliability, availability, maintainability, CBRN survivability, electromagnetic interference/compatibility, CTPs, refinement and ruggedization of hardware and software configurations, and determination of technical risks.

e. Production qualification test. A PQT is a system-level DT conducted prior to the FRP decision review to ensure the effectiveness of the manufacturing process, equipment, and procedures. The PQT also provides data for the independent system OA required for materiel release so that the system evaluator can address the adequacy of the materiel with respect to the stated requirements (see para 10–15*b*). These tests are conducted on a number of samples taken at random from the first production lot and are repeated if the process or design is changed significantly, and when a second or alternative source is brought online.

(1) The objectives of the PQT are to obtain government confirmation that the design will meet the performance and user requirements and to assess the system's performance envelope (that is, mission capability). The PQT is also used to determine the adequacy and timeliness of any corrective action indicated by previous tests, and to validate the manufacturer's facilities, procedures, and processes.

(2) Before OTs can begin, the MATDEV must prepare an independent government DT report that formally certifies that the system has demonstrated the early engineering and manufacturing development phase reliability test threshold and is ready for the next dedicated phase of the OT to be conducted. The developing agency will establish maturity criteria and performance exit criteria necessary for certification to proceed to the OT. In support of this requirement, risk management measures and indicators with associated thresholds that address performance and technical adequacy of both hardware and software will be defined and used on each program. A mission impact analysis of criteria and thresholds that have not been met will be completed prior to certification for OT. Live-data files will be used, supplemented with user prepared data and executed on target hardware. Conversion procedures and special training requirements are introduced as additional elements for verification and validation.

(3) The PQT may also include tests that are not included in the contract (such as environmental extremes and test-to-failure testing) when such tests are necessary to obtain engineering data to verify corrective action and to support a materiel release to the field or for other purposes. The PQT may be accomplished in phases.

f. Software development test. A SDT (conducted prior to Milestone C) is a formal test that ensures the technical and functional objectives of the system are met. The software developer, the proponent agency conducting the SDT, and the independent quality control element of the software development center also participate. The proponent agency validates that the functional requirements are being met. The unit or module test is the initial testing level. Testing is executed on local testbed hardware and benchmark test files are used. This testing provides data to assess the effectiveness of the instruction code and economy of subroutines and object components for efficient processing. It also ensures that input and output formats, data handling procedures, and outputs are produced correctly. The cycle or system test involves testing the combination of linkage of programs or modules into major processes. It requires a formal test design plan, a test analysis report, and certification that the objectives were met and satisfactory to all participants.

g. Software qualification test. A SQT is essentially the same as the PQT for materiel systems and may have been designated as a SQT for C4 and IT systems in the past. It is a system-level, DT conducted, post-Milestone C test that ensures design integrity over the specified operational and environmental range and serves the same purpose as a PQT. The objectives of the SQT are to obtain government confirmation that the design will meet performance and operational requirements and to determine the adequacy and timeliness of any corrective action indicated by previous testing. The SQT also identifies safety critical/related issues with the system software. Software that contains safety or critical issues will not be accepted by the government. All stakeholders will be invited to participate in the technical and functional aspects of the test.

h. Interoperability certification test. System and SoS interoperability requirements are designed-in and validated/verified during DT, OT, and/or PVT. Joint and AIC determinations are made based on the data from these tests. Any recertification resulting from system and/or SoS modifications is handled in a similar manner. (See DoDI 5000.02, Enclosure 4, Paragraph 4b(14) and Enclosure 11, Paragraph 12 and DoDI 8330.01, Enclosure 3, Paragraph 3.c.)

i. Cyber electromagnetic activities survivability test and analyses.

(1) Being an element of a system's survivability evaluation, CEMA represents purposeful enemy activity. The entities vulnerable to CEMA are the hardware, data, and transmissions. Enemy actions can be active or passive (for example, jamming or electromagnetic overload) to create hard damage in a system's equipment, or signal interference/electronic interference exploitation.

(2) CEMA survivability tests and analyses contribute to a system's survivability evaluation. Conducting these assessments prior to Milestone C allows time to identify and mitigate technical risks (see DoDI 5000.02). Because of the escalating complexity of CEMA threats, however, a known limitation of conducting vulnerability assessments and penetration and electronic protection tests during DT is that new validated threats may surface by the time the PDRR analyses are conducted in OT.

(3) Penetration and electronic protection tests and vulnerability assessments are building blocks used to develop an effective CEMA survivability system evaluation. Dependent on the individual system's maturity, vulnerability assessments and/or penetration tests may require re-testing to confirm corrections, gain additional certifications, test new features or generally mitigate risks before entering OT.

(a) CEMA vulnerability assessment during DT is a systematic examination of an information system or product to determine the adequacy of security measures, to identify security deficiencies, to provide data from which to predict the effectiveness of proposed security measures, and to confirm the adequacy of such measures after implementation.

(b) CEMA penetration testing during DT is a technical security test in which a highly skilled team attempts to circumvent the security features of an information system. During DT, the team exploits the results of the preceding CEMA vulnerability assessment in order to confirm and demonstrate the impact of vulnerabilities. Defenses against threat offensive cyberspace operations and computer network exploitation are examined through the use of successively more complex levels of penetration testing during DT.

(c) CEMA electronic protection testing during DT examines the system's susceptibility to hostile electronic attack and electronic warfare support. The techniques used may range from those described in the most current STAR (including those that have been previously modeled, simulated, or transmitted to the system) to those that are identified by subject matter experts as being technologically feasible and likely to be a threat to the system. System performance against these electronic attack measures is assessed through tests that utilize progressively more sophisticated threats and technologies during the DTs.

(4) T&E planning for CEMA will be conducted within the auspices of a CEMA survivability subgroup to the T&E WIPT. Members of the CEMA survivability subgroup will represent the PM, CAPDEV, testers, vulnerability analysis teams, penetration teams, PDRR teams, and TRADOC G–2. Support will be tailored for each system.

(5) Prior to entering OT, a system must obtain appropriate authority and/or certification to operate on an open network in accordance with AR 25–2, as well as approval from DOT&E if on DOT&E oversight for OT.

j. Live fire test. 10 USC 2366 requires LFT (that is, realistic survivability testing and/or realistic lethality testing) of covered systems, major munitions programs, or missile programs, and product improvement of covered systems, major munitions programs, or missile programs before proceeding beyond LRIP. Army LFT policy is that—

(1) LF testing is a series of realistic survivability and realistic lethality tests that generally start with component and/or subsystem level tests leading up to a full-up system level (FUSL) LFT (see the Defense Acquisition Guidebook). The FUSL LFT is a major test. Survivability testing translates to testing a system's vulnerability in a combat configuration against munitions most likely encountered in a realistic combat operational environment. Primary emphasis of the vulnerability testing is on potential user casualties while equally considering the susceptibility to attack and combat performance of the system.

(2) Vulnerability testing must address crew, hardware, and system (that is, crew, software, and hardware) vulnerability for threats and impact conditions likely to be encountered in combat. Personnel survivability should be addressed through dedicated measures such as "expected casualties." The ability of personnel to survive should be addressed even in cases where the platform cannot survive. If the system or program has been designated by DOT&E for survivability LF oversight, the PM should integrate the T&E to address crew survivability issues into the LFT&E program. Lethality testing must address lethality against target systems by firing the munitions or missile at adversary systems configured for combat (that is, comparable representative targets).

(3) Vulnerability and lethality testing (augmented by vulnerability reduction studies) must be conducted sufficiently early in system development to allow correction of significant design deficiencies that are demonstrated by the testing, or are shown through vulnerability reduction studies to be corrected in the design of the system, munitions, or missile before proceeding to FRP. The costs of all LFTs for vulnerability and lethality must be paid from funds available for the system being tested (see 10 USC 2366).

(4) Prior to program initiation, the MATDEV notifies the Army T&E Executive if the program should be on the DOT&E oversight for LF.

(5) The LFT&E strategy will include a Plan Matrix that will include all tests, test schedules, responsible agencies, and the planning documents (for example, the LF TDP and/or LF DTP) proposed for submission to DOT&E. The Plan Matrix identifies which plans are provided to DOT&E for approval or for information only. The DOT&E approves the LFT&E strategy via the TEMP approval process.

(6) The LF TDP must be provided to the Army T&E Executive for endorsement 180 days prior to initiation of the FUSL test and be received by the DOT&E for approval at least 90 days before commencement of LF testing. The FUSL LF DTP will be submitted though the Army T&E Executive 60 days prior to the LFT for forwarding to DOT&E for information. For LFT&E strategies not requiring DOT&E approval, LFT test design plans are approved in accordance with the policy contained in chapter 10.

(7) A covered system under 10 USC 2366 will not proceed beyond LRIP until LFT&E is completed and the report describing the results of the test is provided to DOT&E.

(8) ATEC chairs the LF subgroup of the T&E WIPT and schedules meetings to develop and coordinate the necessary logistics T&E activities. ATEC is responsible for developing and coordinating the LFT&E strategy.

(9) The USD (AT&L) (for ACAT ID programs or programs on the DOT&E oversight for LF) or the Army T&E Executive (for all other programs) may waive the requirement for FUSL LF testing. However, before the system or program enters systems acquisition (that is, Milestone B), the USD (AT&L) or the Army T&E Executive must certify to the Congress (through the DOT&E), that FUSL LFT&E of such system or program would be unreasonably expensive and impractical. An Army approved final draft alternate LFT&E plan is due 45 calendar days prior to the development RFP release decision point. The final alternate LFT&E plan is required at Milestone B or as soon as practical after program initiation (see DoDI 5000.02). The requirement for LFT&E planning, coordination, submittal, and/or approval of documentation still applies, to include a LFT&E strategy in the TEMP.

k. Soldier protection testing. The Army will provide DOT&E timely notification of any Army test or activity relating to systems or materiel solutions identified as Soldier protection, regardless of ACAT level, developmental stage, type of testing (acquisition evaluated/non-evaluated), or customer category. A Soldier protection test project is defined as any test or activity which relates to a system or materiel solutions that will provide Soldier protection information related to the increase (or decrease) of lethality, vulnerability, or survivability of the test item (such as, armor solutions, small/large caliber ammo, body armor, helmets, fire suppression, blast mitigation systems, aircraft survivability systems, and active protection systems). The TDP and DTP for Soldier protection testing with DOT&E oversight for LF will be submitted through the Army T&E Executive to DOT&E for approval if formal DOT&E approval is required per the LFT&E Plan Matrix.

l. Logistics demonstration. LD addresses the achievement of maintainability goals of the system hardware and the adequacy and sustainability of tools, test equipment, selected test programs sets, built-in test equipment, and associated support items of equipment, technical publications, and maintenance instructions. It examines the adequacy of troubleshooting procedures; personnel skill requirements; selection and allocation of spare parts, tools, test equipment, and tasks to appropriate maintenance levels; and adequacy of maintenance time standards. A LD is required for all new acquisition systems or system changes which have an operational impact, including any new or improved support and test equipment intended for support of the system. Within available resources, a dedicated production-representative materiel system will be provided for the LD. A non-destructive disassembly and re-assembly of equipment is conducted on the materiel system before the FRP decision review. The LD requires a test design plan and TRP, to include the data to be recorded and the evaluation procedures, and a final report that documents the results, analysis of findings, and recommendations for corrective actions. Part III of the approved TEMP will contain the LD requirements (see AR 700–127).

m. Physical configuration audit. The PCA is the physical examination of the actual configuration of an item being produced. It verifies that the related design documentation matches the item as specified in the contract. The system product baseline is finalized and validated at the PCA.

n. Functional configuration audit. The FCA verifies that all item (or subsystem) requirements established in the functional and allocated baselines, specifications, and test design plans have been tested successfully, and corrective action has been initiated, as necessary.

4–4. Post-full-rate production and/or deployment testing—common to all hardware and software-intensive systems

Post FRP/FD developmental testing is conducted to verify that requirements specified in technical data packages and production contracts for hardware and software are met. During the production and deployment phase, DT also provides a baseline for post-production testing during the operations and support phase. Except as specifically approved by the MDA, critical deficiencies identified in testing will be resolved prior to proceeding beyond LRIP or limited deployment. Remedial action will be verified in follow-on T&E. Generally, DT for C4 and IT systems supports PDSS. If a software baseline change of major proportions (such as redesign) appears necessary, the development phase of the C4 and IT system will be re-entered and testing will follow the same procedures as discussed in paragraph 4–3. Minor software changes may also require testing (see para 4–3*f*), but test objectives, functions and responsibilities are scaled down depending on the number, magnitude, and complexity of the modifications being tested. Post FRP DT types include the following:

a. Production verification test. A PVT is a system-level test conducted to verify that the production item meets CTPs and contract specifications, to determine the adequacy and timeliness of any corrective action indicated by previous (pre-FRP) tests, and to validate manufacturer's facilities, procedures, and processes. A PVT will also provide a baseline for the test requirements in the technical data package for post-production testing. The PVT is accomplished during the first limited production or full-scale production contract.

(1) The PVT may take the form of a FAT if such testing is required in the technical data package (see para 4–4*b*).

(2) The PVT may also include tests that are not included in the technical data package or contract (for example, environmental extremes and test-to-failure testing), when it is necessary to obtain engineering data for corrective action verification or to support a materiel release decision.

(3) Follow-on PVTs may be conducted, as necessary, if the production process or design is significantly changed, or to verify the adequacy and timeliness of corrective actions indicated by the PVT.

b. First article test. A FAT may be required for quality assurance purposes to qualify a new manufacturer or new procurements from a previous source that has been out of production for an extended period (usually 2 years), and to produce assemblies, components, or repair parts that conform to requirements of the technical data package.

(1) Requirements for first article testing may be invoked in production contracts by citing the applicable Federal Acquisition Regulation first article inspection and approval clause. When a FAT is specified in a contract, it may not be waived or changed without prior approval of the head of the contracting activity. FATs may be conducted at government facilities or at contractor facilities when observed by the Government.

(2) FAT for items directly affecting Soldier survivability (for example, body armor or gas masks filters) will always be conducted at a government test facility in accordance with approved test operations procedures (TOPs) developed by ATEC and agreed upon by DOT&E (if on DOT&E oversight). The FAT must be conducted by adhering precisely to the TOP, including all instrumentation and setup, and be certified by ATEC. ATEC will both periodically and randomly check for continuing certification. Determination of whether an item falls under the compliance requirements of this paragraph rests with the Army T&E Executive within the office of the DUSA, given the enduring interest of the Secretariat in ensuring Soldier survivability.

c. Comparison test. These tests are tests of a randomly drawn sample from a production line. A comparison test is conducted as a quality assurance measure to detect any manufacturing or quality deficiencies that may have developed during volume production and which may have reduced effective operation of the item or resulted in item performance degradation. Comparison testing is conducted or supervised by an agent independent of the producer or government onsite quality assurance personnel. A comparison test may be conducted at procuring agency facilities, government testing installations, or contractor facilities.

d. Live fire test. If required for product improvements of covered systems, a LFT will be performed after the FRP decision review for modifications to a covered system that are likely to significantly affect the survivability or lethality of the system.

e. Quality conformance (acceptance) inspection. This inspection examines and verifies tests that are normally prescribed by the contractor in the technical data package for performance, and that are subject to performance (or witnessing) by the onsite quality assurance representative on the items, lots of items, or services to be offered for

acceptance under a contract or purchase order. These examinations and tests include, as necessary, in-process and final measurements or comparisons with the technical quality characteristics required to verify that the materiel meets all the terms of the contract and should be accepted by the government.

f. Lot acceptance test. A LAT is based upon a sampling procedure to ensure that the product retains its quality. No acceptance or installation of a lot should be permitted until a LAT has been successfully completed. LATs must be performed to specified statistical sampling procedures identified through scientifically based test and analysis techniques and methodologies. While the LAT for Soldier survivability systems (for example, body armor and gas mask filters) may be done at locations other than at an ATEC test facility, the LAT must be conducted by precisely adhering to the TOP (including all instrumentation and setup) and both the facility and the personnel (and the associated training of personnel) must be certified by ATEC to perform the TOP. ATEC will periodically and randomly check for continuing certification. All LAT testing of Soldier protection items will be witnessed by an ATEC government representative certified in those specific test procedures. Determination of whether an item falls under the compliance requirements of this paragraph rests with the Army T&E Executive within the office of the DUSA, given the enduring interest of the Secretariat in ensuring Soldier survivability.

g. Tests in support of post deployment software support. DTs in support of PDSS for software intensive materiel systems parallel those described for pre-FRP but are usually abbreviated based on the number, magnitude, and complexity of the modifications or maintenance.

h. Surveillance tests. Surveillance tests measure the ability of materiel in the field, in storage, and after maintenance actions (including repair, rebuild, retrofit, overhaul, and modification) to meet user requirements and may contain tests in support of PDSS. Surveillance tests include destructive and nondestructive tests of materiel in the field or in storage at field, depot, or extreme environmental sites. Surveillance tests are conducted to determine suitability for use of fielded or stored materials, to evaluate the effects of environments, to measure deterioration, to identify failure modes, and to establish or predict service and storage life. Surveillance test programs may be at the component-through-system level. System-level programs may include dedicated hardware allocated for this purpose, fielded materiel, or supplies in storage. Storage sites may include depots, field storage, or extreme environmental locations. "Libraries" of component parts provide a baseline for subsequent surveillance test data comparisons and may be established at contractor or government facilities. Criteria for surveillance testing will be prescribed in the appropriate technical bulletins, technical manuals, storage serviceability standards, and surveillance test program plans. Test criteria will be based on performance demonstrated during development and production. The number of items to be tested and the test duration will be based on scientifically-based test and analysis techniques and methodologies that consider schedules, costs, item complexity, known problem areas, statistical confidence, and other factors (see para 1–5*i*). Prior test data and analytically derived design data will be used when the test and sampling plan is developed. Existing test facilities will be used rather than building new government or contractor facilities.

i. Reconditioning tests. Reconditioning tests measure the ability of materiel in the field, in storage, and after maintenance actions (including repair, rebuild, retrofit, overhaul, and modification) to meet user requirements. They may also contain tests in support of PDSS. Reconditioning tests fall into several categories—

(1) *Pilot reconditioning tests.* Pilot reconditioning tests are conducted to demonstrate the adequacy of the documented technical requirements, processes, facilities, equipment, and materials that will be used during volume reconditioning activities. The pilot model will be reconditioned in strict accordance with depot maintenance work requirements, modification work orders, technical manuals, technical bulletins, and contracts. Pilot reconditioning tests will be applied when depot maintenance work requirements, technical manuals, or technical bulletins are used for the first time when major changes are made.

(2) *Initial reconditioning tests.* Initial reconditioning tests are conducted to demonstrate the quality of the materiel when reconditioned under volume (rate) procedures and practices. These tests relate to PVTs during production. Initial reconditioning tests will be conducted when an item is reconditioned for the first time by a government or contractor facility, when changes in processes or facilities occur, or when there has been a significant break in reconditioning operations.

(3) *Control tests.* Control tests are conducted on randomly selected items from volume reconditioning operations to verify that the process is still producing satisfactory materiel. Criteria should be the same as for initial reconditioning tests. Control tests relate to comparison tests during production.

(4) *Acceptance tests.* Acceptance tests are conducted on in-process materiel and when reconditioning activities are completed. An accept (or reject) decision is based on an acceptance test.

(5) *Baseline evaluation tests.* These tests are conducted simultaneously on reconditioned and new production materiel of the same configuration in order to compare performance and to determine the degree of reconditioning required. Baseline evaluation tests will be considered when the item is being reconditioned for the first time, when

significant modifications affecting performance are incorporated, or when data is needed to decide on upgrading versus new procurement.

j. Regression tests. Regression testing is a type of software testing that seeks to uncover new software bugs, or regressions, in existing functional and non-functional areas of a system after changes such as enhancements, patches, or configuration changes have been made to them. The purpose of regression testing is to ensure that changes such as those mentioned above have not introduced new faults. One of the main reasons for regression testing is to determine whether a change in one part of the software affects other parts of the software. Common methods of regression testing include rerunning previously completed tests and checking whether program behavior has changed and whether previously fixed faults have re-emerged. Regression testing can be performed to test a system efficiently by systematically selecting the appropriate minimum set of tests needed to adequately cover a particular change.

4–5. Considerations applicable to all developmental tests

a. Planning, programming, and budgeting for DTs during the production and deployment phase will begin early in the life cycle.

b. Production and deployment test requirements will be incorporated in the approved TEMP in support of the FRP/FD decision review. The tests, methods of analysis, and criteria will be described. The number of items to be tested and the test duration will be based on engineering practices and will take into account costs, schedule, item complexity, known problem areas, statistical confidence, and other factors. Prior system and subsystem test data, along with analytically-derived design data, will be used when the test and sampling plan are developed.

c. The PM will ensure that the total system is tested during the PVT. When individual components and subsystems are tested separately by other activities, such testing in itself will not meet total system test requirements.

d. Materiel development and acquisition commands will establish procedures to ensure the timely planning, testing, reporting, and resolution of deficiencies on newly produced materiel, and to ensure that DT requirements are identified to allow appropriate flexibility regarding the test, such as—

(1) Tailoring sample sizes to meet specific contract requirements.

(2) Terminating during early testing if performance is so poor that re-testing will be required regardless of the results of the remaining portion of the tests.

(3) Reducing, eliminating, or terminating tests when there is sufficient data and evidence available to confirm that the materiel meets the technical requirements.

Chapter 5
Operational Testing

5–1. Introduction

Although DT and OT are discussed in separate chapters in this regulation, as discussed in paragraph 3–1*h*, T&E programs will be structured as an efficient, integrated continuum that obtains necessary, validated data from many sources. The efficient, integrated continuum constitutes a process that will be used to provide the maximum benefits from a complete, unified T&E program by efficiently using resources to decrease acquisition cycle time. The process envisions the development of a single integrated test/simulation execution strategy leading to a single EOA or OA report and SER. An OT is not simply a larger scale DT consisting of a full-up system in a SoS environment. The phrase "works as intended" is often not completely aligned with the phrase "provides intended benefits to the force." The purpose of an OT is to generate data and information to answer the COIs that describe useful military capability improvement when issued to an unit in the operating force. Each system must be tested and evaluated as a force enabler during its intended activities by using the COIC as the basis of the planned evaluation methodology. The system should always be operationally tested in accordance with the assigned BOIP, TTPs, OMS/MP, doctrine, threat countertactics, personnel and unit equipment, interactions with peer, and higher and lower systems. Post-OT root cause analysis may point to the BOIP (for example, "too sparse," or "assigned to the wrong area of the battlefield"), to the CONOPS not being viable, or to the output interface's reliance on other systems that have not yet been upgraded and thereby negatively affect the systemic intent. When an OT highlights a problem, the root cause can sometimes be traced to inadequate technical performance in operation. Inadequate technical performance during an OT can be avoided by conducting operationally realistic DT and by judiciously using M&S so as to understand the second order effects of changing the BOIP or critical elements in the end-to-end chain of connectivity. Major technical measurements are usually taken during an OT as an opportunity to determine if there is performance degradation under load factors. Even so, technical measurements taken during an OT are not operational measurements. Occasionally, some types of relevant operational loadings cannot be replicated during the formal IOT and, therefore, the SEP must specify how to acquire the best data for that purpose. Important aspects of achieving operational relevance is to incorporate

Soldier/troop stress, end-to-end effects chains, an operationally realistic and validated threat, friendly-threat interactions, system loads, and operational environments. A proper OT provides information to senior leaders on the likely Army and unit benefits, Army systemic costs, vulnerabilities and risks, and known limitations.

5–2. Types of operational tests

The OT is a field test performed under realistic combat conditions of any item or key component of weapons, equipment, or munitions for the purpose of determining its effectiveness, suitability, and survivability for use in combat by typical military users. OTs will be planned and conducted within the stipulations of the safety release which indicates the operational limits, precaution conditions under which the system is safe for use and for maintenance by Soldiers, and specific hazards of the system. OTs generate data and information necessary for independent EOA reports, OA reports, and SERs. OTs will be designed to provide estimates of RAM characteristics against user-specified operational RAM requirements in a variety of expected operational conditions, as established by the OMS/MP (see AR 702–19). M&S can be employed when operational conditions cannot be employed or are not tested in the OT. All OTs will be conducted in accordance with the approved TEMP and approved test design plan. All OTs will be categorized as listed in subparagraphs a through c of this paragraph, and they should be selected with the objective of building an efficient and effective OT strategy to support a given acquisition strategy of the system.

a. Pre-full-rate production/full deployment Common to all systems.

(1) EUT.

(2) LUT.

(3) IOT.

b. Post-full-rate production/full deployment.

(1) FOT.

(2) User acceptance test (UAT) (unique to IT systems).

c. As-required tests.

(1) CT (common to all systems).

(2) Supplemental site test (SST) (unique to IT systems).

(3) Regression test (unique to software-intensive systems).

5–3. Guidance applicable to all operational tests

a. All OTs related to the acquisition of systems under AR 70–1 and listed in paragraph 5–2 will be documented in the approved TEMP with the associated TRPs that were approved in the TSARC process and included in the FYTP.

(1) For any OT listed in paragraph 5–2 requiring operational assets of any kind, including subject matter experts, the OT test officer must ensure a TRP developed and submitted to the TSARC for validation and resourcing.

(2) Requirements for any added (out-of-cycle) testing must be generated by the T&E WIPT process, submitted as a change to the approved TEMP, and accepted by the TSARC unless directed differently by a higher authority. Unless prohibited under 10 USC 2399 or 10 USC 2366, costs for unprogrammed testing must be borne by the activity that generates the requirement for conduct of the test.

(3) The PM is responsible for submitting all TRP out-of-cycle memorandums to the TSARC.

(4) All tests that require ACOM or ASCC operational assets (such as Soldiers) must comply with the FYTP notification requirements. FORSCOM optimally requires a 2 year notification period for units and a minimum of 180 day notification period for individual Soldiers, civilians, and other assets in order to comply with Army Doctrine Publication (ADP) 7–0 training schedules. All TRPs that provide notification less than 180 days from the resource date are defined as late taskings and require an official tasking approved by DCS, G–3/5/7 prior to commitment of Soldiers and units. When an OT requires Soldiers, civilians, and other assets from TRADOC, TRADOC requires a minimum of 120-day notification. FORSCOM typically provides the units and/or Soldiers as test players, when feasible, based upon available funding.

(5) TRADOC, in coordination with the OT organization, provides subject matter experts. Subject matter experts are not data collectors.

(6) USASMDC/ARSTRAT, MEDCOM, IMCOM, INSCOM, U.S. Army Pacific, U.S. Army Europe, and others provide personnel and other assets (including ammunition, flying hours, and fuel) (supporting OTs and have similar notification requirements).

(7) Sharing of test resources will be investigated and used, whenever feasible.

(8) The TSARC membership will resolve the details of test scheduling and out-of-cycle requirements (see chap 9).

(9) Limited deployment for software developments is principally intended to support OT&E and can, consistent with the program strategy, be used to provide tested early operational capability to the user prior to the FD decision.

b. Each major OT (that is, an OT that is reflected in the integrated test program summary of an approved TEMP) will have test entrance and exit criteria.

c. The operational tester, in consultation with the PM, CAPDEV, and/or force modernization proponent, will ensure that realistic OT scenarios are based on the CONOPS, OMS/MP, and mission threads derived from the Joint Mission Essential Task List or Army Mission Essential Task List.

d. Test infrastructure, resources (including threat representations), and tools to be used in OTs must undergo verification and validation by the developer and accreditation by the operational tester. Test infrastructure, resources, and tools, and their associated VV&A strategies will be documented in the approved TEMP.

e. CEMA may be assessed during early operational testing (that is, EUT and LUT), as well as IOT. Threats must be validated by TRADOC, DCS, G–2 and accredited by the Threat Accreditation Working Group before they can be applied in any OT. Prior to entering an OT, a system must obtain appropriate interim authority to test and/or certifications to operate on an open network in accordance with AR 25–2, and approval from DOT&E (if on DOT&E oversight). All systems capable of sending and receiving digital information will undergo operational CEMA protection testing (see DoDI 8500.01). Such testing is independent of any requirements for certification and accreditations. During EUT, LUT, and when conducted, IOT, a CEMA cooperative vulnerability and penetration assessment and adversarial assessment (which includes threat offensive cyberspace operations Red Teaming) will be conducted using production representative systems in an operational environment using tactical operators, as required. During IOT, the realistic operational environment must include systems and networks operated by tactical operators, as well as system and network administrators. During the cooperative vulnerability and penetration assessment, in support of technical analyses, vulnerability assessors will interview operators to determine their knowledge of PDRR and/or CND techniques for their system/network and determine the sufficiency and completeness of requisite documentation and TTPs. Vulnerability assessors use the findings during this phase to instruct and advise operators and assist PMs/system designers in mitigating cyber vulnerabilities prior to threat offensive cyberspace operations portrayal in the adversarial assessment. During the adversarial assessment, a threat offensive cyberspace operations team (a subset of the OT's opposing forces) attempts to exploit the network. Due to the risk of damage to an entire network and the possibility of adversely affecting other OT objectives, only personnel with National Security Agency, or designee, certifications may portray threat adversarial assessment teams. The threat offensive cyberspace operations team is permitted to research open sources to attempt to exploit, alter, or control the system under test but does not have access to the cooperative vulnerability and penetration assessment results conducted immediately prior to the adversarial assessment (unless approved by ATEC as an exception due to test limitations). During the adversarial assessment, the PDRR vulnerability analysts assess the system and operational users' abilities to provide CND and/or mitigate a threat offensive cybersecurity operations/electronic warfare attack.

f. For all IT systems, including national security systems, AIC testing must be completed prior to an OT or, based on approval of the system evaluator, can be completed after the conclusion of the scheduled OT but before a fielding decision recommendation.

5–4. Pre-full-rate production and/or full deployment testing—common to all systems

Operational testing for systems normally occurs from program initiation (normally, Milestone B) to the FRP/FD decision review. Pre-FRP/FD test requirements will be incorporated into the approved TEMP in support of Milestones A, B, or C. The types of OT conducted prior to FRP and/or FD are EUT, LUT, and IOT and are defined below.

a. Early user test. The EUT, a generic term, encompasses all system tests employing users that are representative of those expected to operate, maintain, and support the system when fielded or deployed which is conducted during the technology maturation and risk reduction phase or early in the engineering and manufacturing development phase. The EUT may test a materiel concept, support planning for training and logistics, identify interoperability problems, and/or identify future testing requirements. An EUT provides data and information for an EOA report in support of Milestone B. A FDT/E may comprise all or part of an EUT. EUTs use procedures that are described for IOT in paragraph c below and are modified as necessary by maturity or availability of test systems and TSPs. EUTs seek answers to known issues that must be addressed in an EOA report.

b. Limited user test. A LUT is a type of OT, other than an IOT, normally conducted during the engineering and manufacturing development phase. LUT test articles are generally prototypes that are not pre-production or production representative. A LUT is equivalent to the OA specified in DoDI 5000.02 which addresses a limited number of COIs and/or additional evaluation issues. The intent of a LUT is to provide program risk reduction and to identify key potential user, seam, interface and operational usage issues in order to reduce risk of finding major issues during the IOT. Use of the term "limited" is intended to ensure that the LUT is viewed as a risk reduction effort for user concerns or insights about the most likely or the potentially most disruptive IOT issues. A LUT is not a pre-test that is conducted prior to an IOT. The closer the conduct of the LUT resembles the planned IOT, the more likely it is to perform its

purpose, but this should be subject to a cost benefit analysis by the T&E WIPT. A T&E strategy that includes conducting a LUT in addition to the IOT allows for a 'crawl-walk-run' approach and minimizes the risk associated with the LRIP decision. A LUT will not be used to circumvent statutory requirements for an IOT before the FRP/FD decision review. A LUT will not be used to piece together an IOT through a series of LUTs. If conducted during the production and deployment phase, a LUT will not be used in lieu of a FOT.

(1) A LUT for materiel systems may be conducted to provide a data source for an OA report in support of the LRIP decision (Milestone C) and for reviews conducted before IOT. A LUT may be conducted to verify fixes to problems discovered in IOT that must be verified prior to the FRP decision review (that is, fixes of such importance that verification cannot be deferred to the FOT).

(2) A LUT for C4 and IT systems may be conducted to provide a data source for an OA report in support of acceptance of hardware and commercial off-the-shelf software for operational testbeds and interim blocks of software functionality prior to the IOT. Additional LUTs may be conducted to verify fixes to problems discovered in any previous test or to support acceptance of blocks of functionality subsequent to the IOT but prior to acceptance of the objective system.

c. Initial operational test. Acquisition programs will be structured to determine the operational effectiveness, operational suitability, and survivability of a system operated by typical users under realistic conditions (such as combat and representative threat). 10 USC 2399 requires initial operational test and evaluation (IOT&E) before a MDAP proceeds beyond LRIP. For all programs on DOT&E oversight for OT, ATEC will conduct an independent, dedicated phase of IOT before the FRP/FD decision review that provides objective test results free from potential conflicts of interest or bias. For DOT&E T&E oversight programs, the IOT cannot commence until the DOT&E approves the IOT test design plan in writing. In making the FRP/FD decision, the MDA will conduct a review, either prior to or during the FRP/FD decision review, to assess the IOT results and consider any new validated threat environments that might affect operational effectiveness, and may consult with the requirements validation authority as part of the decision making process to ensure that capability requirements are current (see DoDI 5000.02).

(1) For materiel systems, the IOT will be conducted using LRIP systems assembled using the parts, tools, and manufacturing processes intended for use in FRP. The system will also utilize the intended production versions of software. In addition, the logistics system and maintenance manuals intended for use on the fielded system should be in place. When the use of LRIP articles is impractical, the system used in IOT should, at a minimum, incorporate the same parts and software items to be used in the LRIP articles. In particular, production representative hardware and software should be as defined by the system-level critical design review, FCA, and system verification review including the correction of appropriate major deficiencies identified during developmental testing. If LRIP is not conducted for programs on DOT&E oversight for OT, fully production-representative test articles, per DOT&E criteria established in DoDI 5000.02, must be provided for IOT. Manufacturing processes to be used in FRP should also be adhered to as closely as possible. DOT&E must be provided detailed information describing any process differences in order to independently evaluate whether the differences are acceptable. Proposals to use articles not from LRIP to conduct IOT will be considered for approval by the Army T&E Executive or by DOT&E when the program is on DOT&E oversight for OT. IOT will be conducted in a realistic threat environment based on the program's STAR and enhance operationally realistic scenarios.

(2) For IT systems, the IOT uses a production database and is executed on target hardware/software. The IOT should include the conversion, training, and software verification and validation processes to ensure that the system meets the collective user and functional sponsor needs, can be operated by users, and is ready for deployment.

5–5. Post-full-rate production and/or full deployment testing

Operational testing in post-FRP/FD supports development and fielding subsequent to the IOT, and supports PDSS. Post-FRP/FD testing requirements will be incorporated into the approved TEMP in support of the FRP/FD decision review. Except as specifically approved by the MDA, critical deficiencies identified in testing will be resolved prior to proceeding beyond LRIP or limited deployment. Remedial action will be verified in follow-on T&E which need not be a FOT.

a. Follow-on operational test.

(1) Operational testing during the production and deployment phase for materiel systems normally consists of a FOT. A FOT is an OT that may be necessary during or after production to refine the estimates made during an IOT, to provide data to evaluate system changes, and to verify that deficiencies in materiel, training, or concepts have been corrected. A FOT may also provide data to ensure that the system continues to meet operational needs and that it retains its operational effectiveness in a new environment or against a new threat.

(2) For software intensive systems, if an OT is required to support PDSS, a FOT will be conducted. Post-FRP/FD test requirements will be incorporated into the approved TEMP in support of the FRP/FD decision review. When the

acquisition strategy/DBS Problem Statement is to develop and field additional blocks of functionality subsequent to the IOT, an OT will be conducted on intermediate blocks and a FOT will be conducted prior to the acceptance of the objective system.

b. User acceptance test. The primary purpose of a UAT is to verify the functionality of the changes to the IT in the user environment. Unique for IT systems, if a UAT is required to support PDSS, the operational tester will conduct a FOT. Otherwise, the force modernization proponent will conduct an UAT. In the absence of a force modernization proponent, the CAPDEV will conduct a UAT for systems that are required to support PDSS. For systems that have both a force modernization proponent and a CAPDEV, the force modernization proponent will conduct the UAT. A UAT is limited in scope in relation to a FOT.

5–6. As required testing

All as-required testing requirements that pertain to a specific system acquisition will be incorporated into the approved TEMP.

a. Customer test. A CT is conducted for a requesting agency. The requesting agency coordinates support requirements and provides funds and guidance for the test. A CT is not directly responsive to an acquisition milestone decision, but can provide data to an overall system assessment and system evaluation effort, provided the CT was conducted in an operationally realistic manner. If ACOM or ASCC operational assets are required for the CT, the requirements (via a TRP) will be submitted to the TSARC for validation and resourcing. A CT will not be used to circumvent requirements for an IOT.

b. Supplemental site test. Unique to IT systems, a SST may be necessary to execute in multiple hardware and operating system environments if there are differences between user locations that could affect performance or suitability. The SST can supplement the IOT and UAT.

c. Regression test. Unique to software-intensive systems, regression testing is used to ensure that updates to application software and/or operating systems have not introduced new faults.

5–7. Use of system contractors and developers in operational test and evaluation

In accordance with 10 USC 2399, as implemented by DoDI 5000.02, persons employed by the contractors for the system being developed may only participate in OT&E of systems on DOT&E oversight for OT to the extent they are planned to be involved in the operation, maintenance, and other support of the system when deployed in combat. System contractors are prohibited from participating in the IOT of all programs, regardless of ACAT, as described in paragraphs 5–7*a* through 5–7*c*. The intent is to prevent actual or perceived system contractor manipulation or influence during the IOT or during activities that provide input for consideration in the system evaluation.

a. During IOT or associated activities, system contractor personnel will—

(1) Not participate, except to the extent that they are involved in the operation, maintenance, and other support of the system when it is deployed in combat.

(2) Not establish criteria for data collection, performance assessment, or evaluation activities for data.

(3) Not participate in collecting, reducing, processing, authenticating, scoring, assessing, analyzing, or evaluating data.

(4) Not attend or be directly involved as members or observers in data authentication group sessions or RAM scoring and assessment conferences that address data supporting assessment and evaluation of their systems.

b. Discussions with system contractor and developer personnel may be necessary to ensure full technical understanding of test incidents observed during IOT or activities. All such discussions will be held separately from any RAM scoring and assessment activities. The MATDEV should maintain a written record of the nature of these contractor/government discussions.

c. Results of DTs using contractor personnel or results of contractor in-house testing may be considered in EOA reports, OA reports, and SERs along with OT data collected (see paras 5–7*a* and 5–7*b*).

5–8. Equipment disposition after operational testing

Disposition of all systems, along with ancillary test equipment, after the test is completed is decided on a case-by-case basis by the MATDEV, tested unit, and system evaluator. The tested unit may retain the system after a LUT or an IOT is completed for use as a CE testbed or other use pending a formal fielding decision. The T&E WIPT will document the disposition of equipment in the approved TEMP to ensure feasibility, supportability, and funding. After completion of the test, a MOA will be signed by the MATDEV, system evaluator, and tested unit to confirm the use of the system as a CE testbed or other use pending a formal fielding decision. Any operation and maintenance supportability and funding issues will be included in the MOA.

Chapter 6
System Evaluation

6–1. Independent system evaluation and system assessments

Independent system evaluation and system assessments are designed to provide unbiased advice on system development to Army and DoD decision makers. The system evaluator, who is organizationally separated from the MATDEV and CAPDEV, provides such advice thereby ensuring a completely objective perspective. While in cooperation with the MATDEV, CAPDEV, and other T&E WIPT members, the system evaluator must always maintain a professional and emotional detachment from the system so as to ensure complete objectivity. An EOA report (based on an EUT when conducted) will be submitted to support Milestone B. An OA report (based on DT results or separate dedicated OT events such as a LUT) is required in support of a LRIP decision at Milestone C. A SER (based primarily on IOT and LFT results when conducted) is required in support of the FRP/FD decision review.

6–2. Continuous evaluation process

a. The CE process consists of early and frequent assessments of system status during development. T&E plans should consist of one or more DTs in each acquisition phase leading up to Milestone C followed by an OT that provides information on system development for the EOA and OA reports. Early system evaluator involvement through early integrated testing can significantly reduce test time and cost through comparative analysis, data sharing, and use of all credible data sources. The purpose of a system assessment and system evaluation is to inform decision makers and to provide a means to ensure that only operationally effective, operationally suitable, and survivable systems are delivered to Soldiers.

b. The system assessment and system evaluation integrates experimentations, demonstrations, and M&S information with available test data (DT and OT) to address CTPs and evaluation issues (that is, COIC and additional issues dealing with other evaluation focus areas). Through the SEP, the need for testing is determined, and unnecessary testing is eliminated. System OA reports will occur at key points during the acquisition process, before and after each milestone decision. The system evaluator will produce system assessment reports (EOA and OA) in support of Milestones B and C, respectively, and a SER in support of the FRP/FD decision review to advise the decision review principals and MDA concerning the adequacy of testing, the system's operational effectiveness, operational suitability and survivability, as well as recommendations for future T&E and system improvements. The SER, in support of the FRP/FD decision review, will use data resulting from the IOT (when conducted) as a major data source, and will contain LFT results integrated with other credible data sources as defined in the SEP (see para 6–4).

c. When a FOT is conducted post FRP/FD, a system OA report will be prepared to address system changes, verify the correction of deficiencies in materiel, training, or concepts, and ensure the system continues to meet operational needs and that it retains its operational effectiveness in a new environment or against a new validated threat.

d. The products of CE are a system EOA, OA, SER, and Materiel Release Position Memorandum (see para 10–15).

6–3. System evaluation and system assessment objectives

a. The primary objective of the independent system evaluation is to address the demonstrated operational effectiveness, operational suitability, and survivability of Army and multi-Service systems for use by typical users in realistic operational environments. The primary objective of the independent system assessment is to address system potential operational effectiveness, operational suitability, and survivability. Other objectives are—

(1) To assist the MATDEV by providing information relating to technical parameters and contractor performance.

(2) To assist the CAPDEV and MATDEV by demonstrating and providing information relative to operational performance, DOTMLPF–P, TTPs, IPS, HSI, technical publications, RAM, correction of hardware and software deficiencies, and refinement of requirements.

(3) To determine a system's actual, or potential, operational effectiveness, operational suitability, and survivability by having the system evaluation/system assessment:

(a) Determine military utility in terms of additional operational capability provided in order to fill a critical operational capability gap which includes a comparison with current mission capabilities using existing data, so that measurable improvements can be determined.

(b) Address the mission context expected at the time of fielding, as described in the user's capability requirement documents/DBS Problem Statement, and consider any new validated threat environments that will alter operational effectiveness.

(c) Take into account all available and relevant data and information from contractor and government sources.

(4) To address the effectiveness of the manufacturing process, equipment, and procedures through production qualification T&E.

(5) To confirm that the system meets DT and OT entrance criteria as specified in the approved TEMP.

(6) To confirm readiness for OT by ensuring that the system is stressed to at least the levels expected in the operational realistic environment, and by demonstrating a level of achievement of system performance, safety, health hazards, survivability, human factors engineering, RAM, and IPS. The primary purpose is to ensure that OT will be successfully and safely completed.

(7) Provide timely information to the decision authority about system performance capabilities, limitations, operational effectiveness, operational suitability, and survivability, readiness to proceed to the next acquisition phase, as well as recommendations for future efforts.

b. The system evaluation, and to a lesser degree the system assessment, will examine system capability in required climatic and realistic battlefield operational environments, including natural, induced, and countermeasure (including CEMA) environments.

c. The system evaluation documents the operational effectiveness, operational suitability, and survivability of the system with respect to accomplishing its intended mission in its intended environment based on the requirements documented in the CDD, CPD, and/or DBS Problem Statement. The system assessment provides a determination on the progress that has been made toward the required operational effectiveness, operational suitability, and survivability, and on the adequacy of system progress in meeting the requirements at a given future point in the system acquisition process. The system evaluation (or system assessment) examines system suitability benefits and burdens when compared with systems already fielded or deployed.

d. The PM and ATEC will conduct periodic CEMA risk assessments to determine the appropriate Blue, Green, and/or Red Team, and operational impact test events in alignment with the overall test strategy for evaluating the program for real world effects.

e. DBSs will undergo theft and/or fraud operational impact testing.

6–4. Data sources for independent systems evaluations and system assessments

a. Developmental tests. See chapter 4.

b. Operational tests. See chapter 5.

c. Foreign comparative testing. See paragraph 3–17.

d. Modeling and simulation. M&S provide a set of analytical tools with applications in physics and engineering for components, subsystems, and systems. M&S can address one-on-one system performance, few-on-few system, and force-on-force combat utility and effectiveness. M&S can be used to support a determination of operational effectiveness and operational suitability under conditions that cannot be or are not tested. Simulation capabilities include live, virtual, and constructive capabilities. Ownership and operation of M&S depends on use application and includes organizations responsible for requirements determination, technology research, system development, system and unit training, independent analysis, as well as T&E. The system evaluator will determine the availability of and the need for M&S analyses during development of the SEP. System evaluators must ensure the M&S used are accredited before use in the system evaluation. M&S will not replace (or be a substitute for) test data (see AR 5–11).

e. Market research. The MATDEV and/or PM plans and gathers data on product characteristics, suppliers' capabilities and the business practices that surround them, plus the analysis of that data to make acquisition decisions. Market research may provide data for an assessment of the ability of the commercial marketplace to fill the operational requirements as stated in the system's CDD, CPD, and/or DBS Problem Statement.

f. Other military Services, other U.S. agencies, foreign governments, and data collected by private industry. When acquisition is being considered from these sources, existing or currently programmed data and reports should be requested to support the evaluation. In the case of foreign governments, agreements may be in place or needed to support the exchange of such data.

g. Warfighting experiments. These experiments are conducted by battle laboratories, operational units, Army force modernization proponents (see AR 5–22), and Joint forces to provide data and insights in support of the requirements determination process, force development process, and technology transition process. Each examines the effectiveness and ability to achieve warfighting concepts, military utility and burden of new or existing technology, and contribution of new ideas in doctrine, training, leader developments, organizations, and Soldier specialties. As such, experiments are not elements of the acquisition process. While not designed as rigorous tests to support acquisition decision reviews, experiments may, and generally will, contribute data to operational system assessments and system evaluations and should reduce requirements for testing, particularly in early acquisition phases. Warfighting experiments support the Chief of Staff, Army approved Army Experimentation Campaign Plan and use representative Soldiers in as realistic operational environment as possible via live, virtual, or constructive simulation.

h. Force development test or experimentation. A FDT/E is a test or experimentation program which examines the DOTMLPF–P effectiveness of existing or proposed concepts or products. In support of system acquisition programs,

FDT/E may be stand-alone, related to, or combined with OT and should be identified in the approved TEMP. Before the LRIP decision (Milestone C), FDT/E will be used to assist in defining and refining concepts of employment, logistics, training, organization, and personnel. FDT/E data should also assist in determining essential and desirable system capabilities or characteristics. Prior to the FRP decision review, a FDT/E may be conducted for systems with significant DOTMLPF–P impact (normally ACAT I programs) to assess the status of DOTMLPF–P products prior to IOT. A FDT/E may be used to verify the correction of DOTMLPF–P fixes at initial operational capability when DOTMLPF–P are the only significant issues remaining after the FRP decision review. A FDT/E can significantly increase the probability of a successful OT. (See chap 11 for FDT/E funding.)

i. Joint capability technology demonstration and advanced technology demonstration. A JCTD is a DoD and combatant command sponsored program that assesses the utility of near-term, mature, and readily field-able technology solutions and the CONOPS needed for the effective use of those solutions. The Joint Requirements Oversight Council, USD (AT&L), and Congress validate and approve each JCTD. An ATD is a demonstration of the military utility of a significant new technology and an assessment to clearly establish its operational utility and system integrity (see AR 71–9).

(1) JCTDs and ATDs are used to expedite the transition of maturing technologies from the developers to the users.

(2) When the sponsor of a JCTD or ATD determines the demonstration is complete, but additional development is required before fielding, a CDD guides the needed development process. The EOA report will guide the development of the CDD submitted for validation and approval to support Milestone B decision.

j. Certifications. These are required for connection to networks, such as AIC or DoD Risk Management Framework (see DoDI 8510.01).

k. Data. OT or LFT data collected outside an approved TEMP and/or TDP can be used for a system evaluation of an DOT&E T&E oversight program if the data is first approved by ATEC and DOT&E. Data approval will be based on the understanding of the realism of the test scenarios used and the pedigree (test conditions and methodologies) of the data. Early coordination will increase the likelihood that data will be found acceptable for use in the system evaluation. ATEC and DOT&E will review the TDP prior to the start of testing and witness the test execution. If advance coordination is not possible, ATEC will review the data and test reports (TRs) and make recommendations to DOT&E on its reuse.

l. Evaluated level of assurance. An evaluated level of assurance is required for all hardware, firmware, software and other intermediate technologies used to conduct offensive cyberspace operations and the platforms from which they are executed. An evaluated level of assurance is also required for offensive cyberspace operations techniques and procedures integral to the conduct of offensive cyberspace operations including operational preparation of the environment and dual-use technologies used for military operations (see DoDI O–3600.03).

6–5. General considerations for system evaluation and system assessments

System evaluations and system assessments are prepared to support acquisition milestone or other types of decisions. In addition, the independent system evaluator periodically updates the system evaluation or system assessment. These products are provided to—

a. Assist the CAPDEV and MATDEV by providing information relative to operational performance, doctrine, tactics, IPS, HSI, technical publications, RAM, software, correction of deficiencies, and refinement of requirements.

b. Provide an assessment of readiness to proceed to the next phase of the acquisition process.

c. Establish a baseline for the system. Evaluation of a system incorporates a comparison of the system to a baseline which may represent the capability of the replaced system, capability of a similar system, capability of the new system against a predetermined standards, a force without the new system, or capability of the original system (for system changes). The system evaluator, based on input from the CAPDEV, defines the baseline for the given system. Part III of the approved TEMP describes the baseline concept and evaluation approach with both a developmental and operational focus. A combination of data from studies, field exercises, M&S, side-by-side testing, or other OTs, compares performance of the system with the baseline. To the maximum extent possible, existing baseline data will be used in lieu of baseline testing for system evaluations and system assessments.

6–6. Critical operational issues and criteria

Answering the COIC is the final T&E contribution in the materiel acquisition prior to fielding. COIC provide the basis for the system evaluation and reflect operational outcomes in terms of operational satisfaction rather than being based upon technical specifications. The capability requirement gaps identification generally leads to the conduct of an analysis of alternatives with the goal of determining, within the DOTMLPF–P paradigm, whether a new materiel solution is required as part of the solution space to fill the operational gap or opportunity. COIs respond to the exact same operational proposal (to determine whether the materiel solution under test actually fulfills the original intent) within

the lens of operational effectiveness, operational suitability, and survivability in the unit and field context in which it is expected to be employed. Satisfaction of COIs should be the most enduring part of the acquisition of a program. Developed in context with the draft CONOPS, OMS/MP, the COIs address the usage context and should pre-date the capability requirements documentation, which represents the believed means to the end. Systems are developed and provided to the operating force for an operational purpose, and fulfillment of that purpose is the desired effect or outcome; attainment of the technical specs tested in DT represent enabling means that were believed to be necessary to attain the operational benefit. COIC that describe technical specifications, rather than operational outcomes, and how to measure success in terms of operational satisfaction are not considered 'good' COIC. Programs that have met all technical requirements identified in the capability requirements documentation, but failed to meet operational effectiveness, operational suitability, or survivability, may very well experience major challenges and yet still be identified as combat effective, suitable, and survivable.

a. COIC are the key decision maker operational concerns and/or combat value (issues) with standards of performance (criteria) that must be answered in the affirmative by the system evaluator to determine if the system is ready to enter FRP/FD. COIC are based upon validated requirements. COIC consist of the COI statements with the associated scope, criteria, and rationale.

b. The COIC continually focus on and reflect maturity expectations for the FRP/FD decision review. A breach of a criterion is reason to delay entry into FRP/FD unless other evidence of acceptable system operational effectiveness, operational suitability, and survivability is provided. The COIC are focused on successful mission accomplishment and reflect bottom line standards of performance in the areas of unit status reporting, individual and collective training, deployability, maintenance, sustainability, and critical mission performance including survivability.

c. The criteria must relate to the CDD and/or CPD and the analysis of alternatives. The analysis of alternatives identifies whether the materiel solution is preferred and that the path ahead with the best materiel solution focuses on the operational goals. COIs address the attainment of operational goals and should be expressed in the categories of operational effectiveness, operational suitability, and survivability. As appropriate, COIC will address SoS.

d. Draft COIs will be developed in support of the mandatory MDD required for all acquisition programs based upon the MDA's approval of the analysis of alternatives study guidance which is shaped, in part, by the draft COIs. The directed end-state of an analysis of alternatives should be aligned with the COIs. DCS, G–8-approved COIs are required for the approved TEMP in support of Milestone A. DCS, G–8-approved COIC are included in the updated TEMP in support of Milestone B and further updated (as required) and included in the approved TEMP in support of Milestone C. Subsequent COIC revisions occur for each incremental block under an incremental acquisition and changes are related to revised operational requirements. The approved COIC are included in the approved TEMP and form the basis for planning the evaluation of the system.

6–7. Software test and evaluation

a. When feasible, testing of software for any system should be supported by an accredited model (or emulated hardware or virtual machine) of the digital devices on which the software runs.

b. To the extent feasible, PMs should test prototype human interfaces with operational users.

c. PMs for software acquisitions should develop process models of the time and effort needed to perform critical tasks and functions. Such models support operational TDPs and analysis of results, as well as managerial needs such as sustainment cost projections and analysis of impacts of process changes.

d. PMs must sustain an operationally realistic maintenance test environment in which software patches can be developed and upgrades of all kinds (developed or commercial) can be tested. The maintenance test environment is a model of the operational environment in that it should be able to replicate software defects found in the operational environment.

e. Starting at Milestone B, PMs will provide plans indicating how system logs and system status records will interface with operational command and control.

f. For software in any system, the evaluation of operational suitability will include a demonstrated capability to maintain the software, as well as the ability to track and manage software defects.

g. During or before IOT, the following will be accomplished:

(1) The PM will demonstrate performance monitoring of operational metrics to manage and operate each system capability (or the whole system, as appropriate).

(2) An end-to-end demonstration of regression test, preferably automated, in the maintenance test environment. The demonstration will show how changes in requirements or discovered defects are mapped to lines of software that must be modified, and how modifications in software are mapped to the regression test scripts that will verify correct functioning of the modified software.

h. OT&E for software acquisitions will be guided by the assessment of operational risks of mission failure (see DoDI 5000.02, enclosure 5). A significant risk of mission failure is a risk that is at least moderately likely to occur, and if the risk does occur then the impact will cause a degradation or elimination of one or more operational capabilities. Based upon the risk level, the independent system evaluator will:

(1) Observe agreed-upon testing for any level of risk.

(2) Review plans and observe DT, OT, or integrated testing at the lowest risk level.

(3) Coordinate with the DT test organization to observe and execute some integrated DT/OT in accordance with a DOT&E-approved OT TDP for intermediate risks.

(4) Execute a full OT&E in accordance with the DOT&E-approved OT TDP at the highest risk level.

i. For DOT&E T&E oversight software programs, an OT (generally an EUT or LUT) is required for every limited deployment. The scope of these OTs will be guided by the risk of capability being fielded or deployed.

j. Except as noted in the urgent operational needs, an IOT (or LUT) is required for every increment in any software intensive program. IOT will normally occur prior to the FD decision and will be guided by an updated assessment of the operational risks in the capabilities and system interactions that have not been successfully evaluated in previous operational testing.

Chapter 7
Other Test and Evaluation Considerations

7–1. Waivers of approved testing

Testing specified in the approved TEMP must be conducted unless a written request for waiver is submitted to, and approved by, the TEMP approval authority. Waivers of testing set forth in the approved TEMP will depend on the availability and acceptability of relevant data and information from other sources and will not negate the requirement for independent system assessment and system evaluation.

a. Any command or agency may submit a request to waive approved testing (or portions thereof). Requests must provide sufficient justification and documentation to warrant approval and will be coordinated with the T&E WIPT.

(1) For DTs, the MATDEV prepares a recommendation for approval or disapproval of the waiver, coordinates the recommendation with T&E WIPT members, and forwards it to the appropriate TEMP approval authority for decision. In addition, for LFTs, the request is submitted before program initiation (normally, Milestone B) through the Army T&E Executive to the AAE (or DOT&E if the program is under DOT&E oversight for LF) for approval. If approved, the Army T&E Executive submits the waiver to OSD per the Defense Acquisition Guidebook procedures. For joint interoperability testing, the waiver is submitted by the MATDEV through CIO/G–6 to the Defense Information Systems Agency. For the LD, the waiver is submitted by the MATDEV to Deputy Assistant Secretary of the Army (Acquisition Policy and Logistics), (SAAL–LC) per AR 700–127.

(2) For OT, a request for waiver is coordinated with the T&E WIPT members and submitted to ATEC. ATEC recommends approval or disapproval and forwards it to the TEMP approval authority for decision.

b. Requests to waive approved testing contained in the approved TEMP for—

(1) ACAT I (IC and ID), ACAT IA (IAM and IAC), ACAT II, and other programs on OSD T&E oversight are forwarded to the Army T&E Executive, 2530 Crystal Drive (DUSA–TE) Suite 8000, Arlington, VA 22202–3934, for appropriate coordination at HQDA and OSD.

(2) Other programs are forwarded to the Army T&E Executive, 2530 Crystal Drive (DUSA–TE), (Suite 8000), Arlington, VA 22202–3934 for resolution only if the T&E WIPT and the T&E WIPT members' chains of command are unable to agree on waiver approval.

(3) Written approval or disapproval of the waiver will be provided to all T&E WIPT members.

(4) When tests are waived and there is insufficient data from other sources to assess and/or evaluate the COIC and additional issues, the MATDEV will expand production testing or the FOT will be expanded to address the waived testing data voids.

c. For FUSL LFT waivers, see paragraph 4–3*j*(9).

7–2. Delay, suspension, or termination of testing

The start of testing will be delayed until adequate NEPA documentation has been received, or when a problem is identified that would affect the ability of the data being collected to address the evaluation issues (that is, COIs and additional issues). The start of testing will also be delayed when it is apparent that the system has little chance of successfully attaining CTPs or satisfying the COIC, and deficiencies cannot be resolved before the start of the test. Testing will be suspended when a problem is identified during the test that cannot be resolved within the test schedule. Testing is terminated when test resources are released and the test must be rescheduled.

a. Test officers may delay or suspend testing when necessary, such as when critical or catastrophic safety or health hazards to personnel or equipment are discovered.

b. The MATDEV may delay or suspend DT. Any T&E WIPT member may recommend delay or suspension of DT to the MATDEV (see chap 8).

c. The CG, ATEC or commander of the command conducting the OT may delay or suspend the OT. Any T&E WIPT member may recommend delay or suspension of the OT to the OT commander.

d. When a test is delayed or suspended, the MATDEV convenes a program review to consider future actions. Once the MATDEV has solved the problem, the T&E WIPT will be convened to determine necessary additional tests to validate the solutions. Before testing is restarted, appropriate test readiness reviews will be conducted.

e. The MATDEV notifies the MDA when there are cost and schedule implications.

f. The MATDEV recommends termination of the DT to the MDA when circumstances warrant. For government DTs, the CG, ATEC, can recommend termination when circumstances warrant. The CG, ATEC, or the commanders of other assigned OT activities, recommend termination of OT to the Army T&E Executive when circumstances warrant.

7–3. Major range and test facility base

a. The MRTFB is a designated core set of DoD T&E infrastructure and associated workforce that must be preserved as a national asset to provide T&E capabilities to support the DoD acquisition system (see DoDD 3200.11). DoDI 3200.18 provides for the MRTFB management and operation and stipulates that the Secretaries of the Military Departments are to maintain, operate, upgrade and modernize the MRTFB facilities and ranges for all acquisition and RDT&E users in accordance with the MRTFB funding policies in DoD 7000.14–R. DoDI 3200.18 also places the responsibility for determining and requesting which facilities and ranges shall compose the MRTFB with the Secretaries of the Military Departments. The Secretary of the Army has delegated this responsibility to the Army T&E Executive.

b. The Army activities in the MRTFB are those organizational command elements responsible for managing the capabilities and resources for:

(1) White Sands Test Center, White Sands Missile Range, NM.

(2) Ronald Reagan Ballistic Missile Defense Test Site, U.S. Army Kwajalein Atoll, Marshall Islands.

(3) Yuma Test Center, Yuma Proving Ground, AZ.

(4) Cold Regions Test Center, Fort. Greely, AK.

(5) Tropic Regions Test Center, Panama, Hawaii, Suriname, and Honduras.

(6) West Desert Test Center, Dugway Proving Ground, UT.

(7) Aberdeen Test Center, Aberdeen Proving Ground, MD.

(8) Electronic Proving Ground, Fort Huachuca, AZ. Not all functions (or infrastructure) associated with these eight Army activities are part of the MRTFB.

c. Scheduling of test resources will be completed according to DoDD 3200.11 and DoDI 3200.18.

d. PMs should maximize the use of the MRTFB as part of the overall test strategy. Exceptions must be documented in the approved TEMP (see para B–3*u*).

e. While the MRTFB is maintained primarily for DoD T&E support missions, other U.S. government agencies (Federal, State, and local), allied foreign governments, defense contractors, as well as private organizations and commercial enterprises may be permitted to use MRTFB activities. Without compromising primary responsibility to DoD customers, MRTFB commanders will assure equitable consideration for commercial customers and non-DoD users at their facilities according to DoDD 3200.11 and DoDI 3200.18.

f. Charges for the use of MRTFB activities will be developed in a uniform manner and all MRTFB costs incurred in support of T&E will be billed according to DoD 7000.14–R, Volume 11A.

7–4. Testing for commercial entities

a. There are two statutes that allow Army test activities to conduct business with U.S. commercial entities. Their applicability is dependent on whether or not the test activity is designated as an activity of the MRTFB.

(1) *Major range and test facility base activities.* 10 USC 2681 allows the MRTFB activity to enter into contracts with U.S. commercial entities desiring to conduct commercial T&E activities within the MRTFB. To ensure that government users outside of DoD are not charged more than commercial users, OSD's implementing guidance expands the policy to cover such use by other government users (including State and local entities) (see DoDD 3200.11 and DoDI 3200.18). The MRTFB activity is reimbursed for all direct costs associated with the T&E activities conducted under the contract, as well as any indirect costs related to the use of the installation as deemed appropriate by the MRTFB commander.

(2) *Nonmajor range and test facility base activities.* In accordance with 10 USC 2539b, as amended by section 232 of the Fiscal Year 2008 Defense Authorization Act, which is implemented by DoDI 5535.11, the Army has the authority to provide cost reimbursable services to commercial entities when in the interest of national defense. This authority may not be used to supplant the authority granted under 10 USC 2681. The non-MRTFB activity or laboratory is reimbursed for the direct and indirect costs (total costs) incurred as a result of performing the test activities defined in the contractual agreement. Less than total costs may be approved if there are compelling reasons or it is determined to be in the best interest of national defense to do so. There are also special considerations given as to recovery of less than full costs when the recipient of the benefit is engaged in a nonprofit activity designed for public safety, health, or welfare; payments of full fees by a State, local government, or nonprofit activity would not be in the Federal Government's best interest; or the laboratory directors, facility directors, and/or commander have determined that the administrative costs of determining and collecting the full fees would outweigh the benefits to the activity. (See DoD 7000.14–R, Volume 11A, Chapter 14). The director or commander of the non-MRTFB activity is the approval authority for requests for cost-reimbursable test services to commercial entities.

b. Use of any Army test activity by a commercial enterprise is allowed only if it does not increase the cost to operate the activity while ensuring that the Army is not competing with U.S. commercial sector (private industry) in providing such services.

Chapter 8
Test and Evaluation Working-Level Integrated Product Team

8–1. Essential role

a. A T&E WIPT will be established for every program prior to each acquisition milestone up to the operations and support phase to ensure that T&E integration is accomplished. The primary purpose of the T&E WIPT is to optimize the use of appropriate T&E expertise, instrumentation, facilities, simulations, and modeling to achieve test integration, thereby reducing costs to the Army, decreasing acquisition cycle time, and ensuring the program continues to support the needs of the Army.

b. The T&E WIPT supports the development and execution of the integrated T&E strategy, resolves routine T&E-related issues, and assists the MATDEV in developing and coordinating the TEMP. The primary T&E WIPT objectives are to identify and resolve issues early, understand the issues and the rationale for the approach, and document a quality TEMP that is acceptable to all organizational levels as quickly and as efficiently as possible. All documents should be delivered in a timely manner to keep pace with T&E and acquisition schedules. The T&E WIPT will—

(1) Integrate T&E requirements, accelerate the TEMP approval processes by producing a coordinated TEMP, resolve cost and scheduling problems, and determine test data validation requirements.

(2) Provide a forum to assist personnel responsible for T&E documentation and execution, and ensure that T&E planning, execution, and reporting are aligned toward common goals. The T&E WIPT will be the forum through which T&E coordination among all members of the acquisition team is accomplished.

(3) Support the CE process by accomplishing early, more detailed, and continuing T&E documentation, planning, integration, and sharing of data.

(4) Assist, within their area of expertise, in preparing the T&E portions of the acquisition strategy/DBS Problem Statement, RFP, and related contractual documents, and assist in evaluating system contractor or developer proposals when there are T&E implications.

(5) Operate under the spirit and principles of the IPT and integrated product and process development (IPPD) (see IPPD Handbook). The T&E WIPT will also adhere to the principles in the Defense Acquisition Guidebook to include open discussion, proactive participation, empowerment, and early identification and resolution of issues (see chap 9).

(6) Be established by the MATDEV after approval of a materiel need (for example, ICD, DBS problem statement, or DOTMLPF–P Needs Analysis Report) to assist in finalizing the initial CTPs, COIs and/or COIC, the initial TEMP at Milestone A, and an updated TEMP at Milestone B, Milestone C, and FRP/FD. To ensure an integrated effort, the T&E WIPT must coordinate with other functional groups.

(7) Be chaired by the MATDEV or a designated representative.

(8) Coordinate on requests for waivers of testing in an approved TEMP.

(9) Immediately elevate disagreement on matters of substance through the integrating IPT or command channels to the next higher level for decision. Issues that are unable to be resolved at this point will be brought to the Army T&E Executive for decision.

c. Minutes of all T&E WIPT meetings will be prepared by the T&E WIPT chair and distributed within 10 working days of the conclusion of the T&E WIPT meeting.

8–2. Test and evaluation working-level integrated product team composition

a. The MATDEV will ensure that all commands, field agencies, human resource elements, and other organizations, as appropriate, that have a role or may have a potential role in a particular program's T&E are extended invitations to the initial T&E WIPT meeting. Principal T&E WIPT members include but are not limited to the following:

(1) MATDEV (PEO, PM, or other as appropriate).

(2) CAPDEV (to include combat developer, training developer, and trainer).

(3) System evaluator.

(4) Developmental tester.

(5) Operational tester.

(6) Interoperability tester (when requested or as needed).

(7) Threat integrator (DCS, G–2 or designated representative).

(8) Logistician (ASA (ALT) Acquisition Policy and Logistics or designated representative).

(9) For HQDA-level approvals of the TEMP, the following HQDA offices are included: Army T&E Executive; ASA (ALT); DCS, G–1; DCS, G–2; DCS, G–3/5/7; CIO/G–6; and DCS, G–8. The offices that declare intent not to participate in the T&E WIPT forfeit organizational inclusion in the coordination of the TEMP prior to HQDA approval.

(10) Any ACOM or agency that has a role critical to the success of the program by providing analyses, survivability, lethality, interoperability, CEMA, nuclear, biological, and chemical (NBC) survivability, and HSI.

(11) When the TEMP is approved by OSD, representatives from OSD are invited to participate.

b. At the conclusion of the initial T&E WIPT meeting, those organizations that are critical to the T&E WIPT body will be identified. MATDEV/PM will develop and approve the T&E WIPT charter that identifies representatives from these organizations as principal T&E WIPT members. The MATDEV, CAPDEV, and system evaluator will always be core T&E WIPT members. Members of the T&E WIPT must be empowered by their respective organizations to provide command positions.

c. The T&E WIPT will establish, as necessary, a test synchronization subgroup, RAM subgroup, LF subgroup, threat subgroup, CEMA survivability subgroup, and supportability subgroup. These subgroups coordinate and jointly develop T&E strategies and identify corrective actions. Other subgroups may be chartered, as appropriate.

d. The RAM subgroup will develop an engineering and manufacturing development phase reliability threshold for a program (other than IT) that must be demonstrated at the initial FUSL DT. This threshold will be established early enough to be incorporated in the engineering and manufacturing development phase contract, approved as part of the approved TEMP, and recorded in the acquisition program baseline at Milestone B. When the RAM subgroup is unable to establish a threshold, the default value will be 70 percent of the reliability threshold requirement specified in the CDD. The threshold must be demonstrated with a minimum of 50 percent statistical confidence, calculated using standard confidence level procedures. For programs that have a single-shot capability and when insufficient test assets are available to gain a statistically significant sample size, the ATEC and the PM may jointly agree that the 50 percent statistical confidence requirement can be waived.

e. The T&E WIPT chair must be a knowledgeable member of the acquisition community with a significant background and experience in the T&E field. For MDAP and MAIS programs, the T&E WIPT chair will be the chief developmental tester. For other programs, it is recommended that the T&E WIPT chair be a T&E Level III Defense Acquisition Workforce Improvement Act certified professional. Contractors may not be a T&E WIPT chair as the functions are inherently governmental functions.

Chapter 9
Test Schedule and Review Committee

9–1. Essential role

The TSARC provides an Army-level centralized management of resources to ensure that all Army tests (see chaps 4 and 5), JT&E, MOT&E, experiments, demonstrations (such as, FDT/Es, JCTDs, ATDs, and LDs) (see chap 6), investigations, and studies are scheduled with the appropriate Army priority and executed in the most efficient and effective manner possible.

9–2. Mission

The mission of the TSARC is to provide high-level centralized management of Army resources in order to maximize the use of limited resources and to minimize the impact on unit operational readiness. For a TRP to be considered and approved by the TSARC for inclusion in the FYTP, it must have an Army approved TEMP containing the mandatory Attachment 1 (Requirements and/or Test Crosswalk Matrix) (see para 10–2*g*) and, when required, Attachment 2 (Test

Synchronization Opportunities) (see para 10–2*h*). The only exceptions to this Army approved TEMP requirement will be for valid accelerated/rapid acquisition tests, JT&E, and operational needs statement-related experiment/demonstration requirements that will enable necessary early TSARC planning. The TSARC chair (as advised by the TSARC CoC) may approve exceptions based, in part, on scheduling needs. A unit cannot be officially tasked by the FYTP until the fully-coordinated TEMP (that is, it has been formally submitted by the PM for approval and concurred with by the PEO, ARCIC, and ATEC) has been submitted to the TEMP approval authority. The TSARC will—

a. Based upon the ASA (ALT) list of integrated test candidates, review the requirements to determine if the candidates meet the integrated testing criteria.

b. Based upon the ATEC and other organizations list of candidates for bundled tests, review the candidates to determine if all of the TSARC bundled test criteria are met.

c. When no candidates for integrated testing or test bundling are received, perform an analysis and present candidates for either category to the CoC for consideration and, as appropriate, make a recommendation to the GO TSARC for approval.

d. Review and coordinate resources for support of Army tests, MOT&E, JT&E, experiments and demonstrations (such as, FDT/Es, JCTDs, ATDs, and LDs) that require operational assets (such as, personnel, instrumentation, and equipment) of any kind.

e. Review and validate coordinated TRPs for inclusion in the FYTP. TRPs requiring a resource commitment (providing personnel, instrumentation, and equipment for the test) from outside the tester's command or agency within one year of TSARC submission will be processed as an out of cycle TRP (see para 9–6*d*).

f. Integrate the TSARC process with the ARFORGEN process.

g. Resolve conflicts between test support requirements and other missions. Resolve testing schedules to minimize the impact of test support on units providing Active Component, Reserve Component, and National Guard support.

h. Submit a recommended FYTP to DCS, G–3/5/7 for approval. The FYTP is a compendium of TSARC validated and HQDA-approved TRPs. It is developed within the existing budget and program constraints in accordance with Army priorities. The FYTP identifies validated requirements to support the Army's test programs, to include JT&Es, MOT&Es, and experiments/demonstrations programs. The FYTP, a DCS, G–3/5/7 tasking document, covers the current and budget years and provides test planning guidelines for the subsequent years based upon in-depth planning. As a result of each TSARC cycle, the DCS, G–3/5/7 FYTP memorandum tasks all organizations who have agreed to provide resources in the validated and approved TRPs.

i. Validate and provide Army test-related resources when another OTA requires Army participation, When the Army requires another Services' support, ATEC will contact the Service's OTA counterpart, who will follow their prescribed process to obtain the requested Services' resources.

9–3. Test schedule and review committee composition

a. CG, ATEC, chairs the GO TSARC and provides a chairperson for the initial WG and mid-cycle WG meetings and for the CoC (see para 9–5).

b. The GO TSARC will be comprised of GOs or equivalent Senior Executive Service representation. The CoC TSARC will be comprised of O–6/GS–15 members from the organizations depicted in paragraph 9–3*c*.

c. TSARC membership will consist of representatives of the Army Secretariat, HQDA staff elements, ACOMs, ASCCs, DRUs, and other Army elements as follows:

(1) Army T&E Executive.
(2) ASA (ALT).
(3) CIO/G–6.
(4) DCS, G–3/5/7.
(5) DCS, G–8.
(6) DCS, G–1.
(7) DCS, G–4.
(8) DCS, G–2 represented by INSCOM.
(9) TRADOC Army Capabilities Integration Center (ARCIC).
(10) FORSCOM.
(11) AMC represented by RDECOM.
(12) U.S. Army Pacific.
(13) USASOC.
(14) NGB, ARNG.
(15) OCAR.
(16) Office of TSG represented by MEDCOM.

(17) Office of the COE represented by USACE.
(18) IMCOM.
(19) ARCYBER.
(20) MSDDC.

d. Representatives of other Army Staff agencies or commands (such as U.S. Army Europe and USASMDC/ARSTRAT) may be invited by the chairperson to participate in the TSARC process, as necessary, and especially when test programs fall in their functional area of responsibility or involve their resources.

9–4. Test schedule and review committee working group

a. A WG will support the TSARC. Each Army organization represented on the TSARC will appoint a working representative (in the grade of major or equivalent DA civilian) and an alternate. In addition, the TSARC WG will include representatives from appropriate Army organizations who can assist in identifying matters of interest for their respective agencies.

b. Any Army organization (such as, TRADOC/ARCIC, USASMDC/ARSTRAT, ARCYBER, RDECOM, and COE's Engineering Research and Development Center) planning to execute a test, JT&E, MOT&E, experiment, or demonstration must submit a T&E WIPT-coordinated TRP to the TSARC via the ADSS.

9–5. Test schedule and review committee council of colonels

As the advisor to the TSARC chair, the TSARC CoC will—

a. Ensure each submitted TRP for FYTP inclusion is based upon an Army-approved TEMP, or assess the risks of submitting a TRP for FYTP inclusion without an Army approved TEMP.

b. Direct that a previously approved TRP be resubmitted as an out-of-cycle TRP when there is significant change in needed resources.

c. Provide recommendations for additional test synchronization opportunities not already documented in an approved TEMP.

d. Identify comparable test schedules and unit resources so tests can be executed simultaneously or sequentially.

e. Conduct special, out-of-cycle meetings to resolve critical issues.

f. Develop and endorse the FYTP for GO TSARC approval.

g. Provide assistance, as requested, to the PM for resource concerns.

9–6. Direction and control

a. The TSARC is a semi-annual process, with fall and spring cycles. Each cycle consists of one GO TSARC, one CoC TSARC, and two WG meetings:

(1) Initial WG meetings are held semi-annually. All new and revised TRPs to be presented will be coordinated with the system PMs prior to submission. The WG members will—

(a) Review new TRPs and those revised since the previous FYTP.

(b) Identify potential resource conflicts for resolution prior to the mid-cycle WG.

(c) Identify potential issues for the TSARC CoC regarding the risks associated with TRPs being submitted for FYTP inclusion without an Army-approved TEMP.

(d) Identify potential issues for the GO TSARC.

(2) Mid-cycle WG meetings are normally held approximately 6 weeks after the initial WG. New and revised TRPs (since the initial WG meeting) to be presented will be coordinated with the system PM prior to submission. The mid-cycle WG members will—

(a) Review TRPs that are new or revised since the initial WG meeting.

(b) Review and resolve resource conflicts identified during the initial WG meeting and the staffing of the draft FYTP.

(c) Identify potential issues for the CoC TSARC.

(d) Verify and validate the need for test-related resources.

(3) The CoC TSARC normally meets approximately 6 weeks after the mid-cycle WG. A paper CoC TSARC is conducted when there are no test resource issues to be resolved. CoC TSARC will—

(a) Resolve test requirement conflicts.

(b) Propose recommendations to a GO TSARC for final resolution when a test requirement conflict cannot be resolved.

(4) GO TSARC normally meets approximately 1 month after the CoC TSARC. If no test resource issues exist, a paper GO TSARC will occur.

b. GOs will resolve test requirement conflicts and recommend TRPs for inclusion in the FYTP. TSARC WG members will ensure that all potential GO-level test requirement conflicts are resolved and that their GO TSARC representative concurs with the TRPs recommended for inclusion in the FYTP. The GO TSARC member concurrence will be provided to the GO TSARC chair. The FYTP will be published after DCS, G–3/5/7 approval and signature.

c. The TSARC chair, or the DCS, G–3/5/7, may also call out-of-cycle TSARC meetings to address critical requirements that cannot wait for a regularly scheduled meeting.

d. A new TRP (or a significantly changed TRP as designated by the CoC TSARC chair) requiring resources within 1 year of the date of submission to the TSARC will be resubmitted as an out-of-cycle TRP. The following procedures apply:

(1) The TRP will be submitted via a memorandum signed by the PEOs, PMs GO, and/or senior executive service-level leadership for approval by the TSARC chair. Copies of the TRP will also be provided to those elements providing resources or support. The memorandum will indicate the following:

(a) Why the submission cannot be delayed and rationale for the TRP submission.

(b) Statement that funding is available and from what source.

(c) A specific calendar suspense date, by when comments and concurrences/non-concurrences must be provided via the ADSS.

(d) If nonconcurrence by any level of TSARC occurs, an out-of-cycle TSARC meeting may be called to resolve the issues. If the GO TSARC chair determines that there is insufficient time to meet the test schedule, an out-of-cycle TRP will be processed as an Exception to Policy TRP.

(e) Exception to policy TRPs will be submitted to the DCS, G–3/5/7 for resolution and potential publication as an addendum to the current FYTP.

(f) Rapid acquisition initiative test events validated by the DCS, G–3/5/7 will not require an out-of-cycle TRP memorandum.

(2) The TSARC chair may call an out-of-cycle TSARC meeting or process the submission by correspondence. If all members concur, the chairperson may approve the TRP for inclusion in the FYTP. Nonconcurrences will be forwarded to DCS, G–3/5/7, with the TSARC chair's recommended action, for resolution.

(3) The WG chair will provide a copy of the out-of-cycle approved TRP to all principal TSARC members for inclusion in the FYTP.

9–7. Administration

a. Guidance and procedures for funding a test are in chapter 11.

b. Guidance and procedures for obtaining Army resources for a MOT&E when ATEC is not the Lead OTA is as indicated in the OTA Commanders' Memorandum of Agreement on Multi-Service Operational Test and Evaluation (MOT&E) and Operational Suitability Terminology and Definitions.

c. A TSARC representative, designated by the TSARC chair, will provide the TSARC administrative support (clerical, space, and equipment), record and distribute minutes of the TSARC meetings, and after DCS, G–3/5/7 approval, publish and distribute the FYTP. The member organizations will provide funds for travel, per diem, and overtime for TSARC representative participation.

d. Correspondence to the TSARC will be addressed to Commander, U.S. Army Test and Evaluation Command, 2202 Aberdeen Boulevard, Aberdeen Proving Ground, MD 21005–5001.

9–8. Test flying hour program

a. Flying hour requirements for tests identified in the approved FYTP will be the basis for ATEC suballocation of flying hours to support tests. Suballocation by ATEC will be contingent upon DCS, G–3/5/7 allocation.

b. Projections for the budget year flying hours will be reported by each ACOM, ASCC, and DRU to ATEC in mid-July. Projected requirements will be reviewed and analyzed by ATEC and forwarded to the DCS, G–3/5/7. The CG, ATEC will provide instructions for the periodic forecast, allocation, and reporting of actual expenditure of test flying hours.

c. Additional guidance and procedures for funding the test flying hours for a test are available in chapter 11.

9–9. Ammunition and missiles program

a. Ammunition and missile requirements for all Army OTs, evaluations, experiments, and demonstrations will be identified in a TRP.

b. Any test organization requiring ammunition will submit projected requirements to DCS, G–3/5/7 for resourcing in accordance with AR 5–13.

c. Other Services and non-DoD agencies are responsible for providing the munitions necessary to support their test requirements. Army organizations that receive requests for Army munitions from other Services and non-DoD agencies will forward them to the DCS, G–3/5/7 (DAMO–TRA) for coordination of resourcing solutions.

Chapter 10
Test and Evaluation Review and Reporting Requirements

10–1. Introduction
T&E documents developed during the Army system acquisition process describe how the T&E requirements will be satisfied. T&E documentation will contain a distribution statement that notes the conditions of its availability for distribution, release, and disclosure (see AR 70–31). Submission of documentation to OSD, to include T&E strategies, plans, results, and reports will comply with the policies and procedures contained in this regulation. Unless specifically waived, the test-related documentation that is required for MDAP programs will be required for all programs on DOT&E oversight, including the submission of system threat assessments reports, TEMPs, OT TDPs, LF TDPs, and the reporting of test results. DOT&E may place any program or system on oversight for OT or LFT at any time.

10–2. Test and evaluation master plan
The purpose of the TEMP is to identify how the data required for system evaluation will be gained. The TEMP is a comprehensive master plan that addresses all major data collection activities required at each stage of development through the FRP and/or FD. This includes all data collection from existing sources as identified in the SEP, associated support activities, validation and use of any SEP identified M&S usage, and all SEP identified data which must be gathered from testing. Covering all major activities, the TEMP allows the PM to properly scope the total resources required to bring the program to the FRP and/or FD decision. A TEMP is overarching in scope and serves to synchronize (in time and location) the use of test assets funded by the PM as they are delivered and made available in different forms (from components through production representative to actual test articles from the production line). Every major test in the approved TEMP will later have a TDP for the conduct of that specific test to standards that will generate data and information to support the SEP required knowledge in whole or in complementary parts. The TEMP, as an enduring master plan, should not contain the level of detail for the "next" test, since that should properly be relegated to the associated TDP. The TEMP is not developed according to what can be afforded, but responds to the information that must be gained in order to answer the data and analytical requirements from the SEP. The synchronized T&E planning supports the gathering of knowledge as directed by the SEP in the areas of testing, M&S, or other sources, in order to identify the required resources to support the system evaluation/assessment. If the resources for the tests exceed the amount of funds available for the program, the issue must be elevated to the appropriate senior forums. The PM is responsible for the TEMP and, as such, controls asset availability and the available flow of funding to support T&E activities. Army TEMP policy and format outline will comply with DoDI 5000.02 (see https://www.dote.osd.mil/guidance/dot-e-temp-guidebook/).

a. Each integrated test program schedule within an Army approved TEMP will contain an activity list depicting the specific type of testing that each test article will undergo. The schedule will be event-driven and allow adequate time to support pre-test predictions; testing; post-test analysis, evaluation/assessment, and reporting; reconciliation of predictive models; and adequate time to support execution of corrective actions in response to discovered deficiencies.

b. Every Army acquisition program will have an approved TEMP in support of Milestone A. An Army approved draft TEMP is required in support of the Development RFP Release Decision Point. An Army approved updated TEMP will be provided prior to release of RFPs for Milestones B and C. To the maximum extent feasible, RFPs should be consistent with the test program documented in the approved TEMP. The TEMP will have a structured technology readiness assessment strategy which will be incorporated into subsequent TEMP updates.

(1) At a minimum, the approved TEMP in support of Milestone A will identify the potential critical technology elements that support the overarching T&E strategy and that will complement timelines for expected technology maturation and risk reduction phase tests and analysis in order to crosswalk critical technologies with their associated tests. The TEMP will also identify the organizations responsible for future potential critical technology element identification during the technology maturation and risk reduction phase.

(2) Detailed test events used to provide technology readiness assessment data will be planned by the PM or the MATDEV. Supporting analysis agencies will review the test data and/or reports and provide an integrated risk assessment report (to include cost, schedule, and technology risk) to the PM and ASA (ALT)'s Army chief scientist prior to the relevant milestone decision. These reports will support overall assessments of TRLs as required by AR 70–1.

(3) TEMPs should include a synopsis of the intended analysis for each major test phase or test that indicates how the required data for test completion will contribute to one or more standard measures of program progress (for

example, COIC, KPPs, CTPs, MOEs, MOPs, and KSAs). Each approved TEMP must discuss and display (or provide a reference to) the calculations done to derive the content of testing and to develop the associated resource estimates.

(4) Expected knowledge points from the technology maturation and risk reduction phase strategy should be included to provide the PM the ability to look at planned technology maturation points and see how they fit within the integrated test program schedule.

c. Every Army acquisition program will have an updated approved TEMP in support of Milestone B (which is normally program initiation) with subsequent updates in support of Milestone C and the FRP/FD decision review. A TEMP must also be updated when the acquisition program baseline has been breached, when the associated JCIDS document (or DBS Problem Statement or Information Support Plan) has been significantly modified (that is, it caused a change in the planned T&E strategy), when demonstrated system performance is inadequate and requires adjusting the integrated test program schedule, or on other occasions when the program is significantly changed or restructured. Incremental acquisition programs may require additional TEMP updates to ensure that the approved TEMP reflects the currently defined program. If an acquisition program baseline breach occurs, the TEMP should be updated to ensure it reflects the restructured program within 120 days of the date of the PM's approved program deviation report. When a program changes significantly, the TEMP due date will be negotiated between the PM and the Army TEMP approval authority within 60 days. In the case of programs under OSD T&E oversight, the negotiations will take place between the PM, the Army T&E Executive, USD (AT&L) DASD (DT&E), and DOT&E within 30 days. Additional TEMP policies (including exceptions) are:

(1) If system changes (that is, modifications or upgrades) cause an operational impact to the system, the system TEMP must be updated (see para 3–5 and the Defense Acquisition Guidebook).

(2) Any reprocurement involving system modifications or upgrades relative to the current technical data package or performance specification that causes an operational impact to the system must have the updated system TEMP approved (see paras 3–5 and 3–7).

(3) The TEMP will be coordinated with the T&E WIPT and signatures documented on a T&E WIPT Coordination Sheet to be included in the TEMP.

(4) For Army programs, the Army-level TEMP approval authorities are as follows:

(a) The Army T&E Executive is the Army-level TEMP approval authority for the following programs: ACAT I (IC & ID), ACAT IA (IAM & IAC), ACAT II programs when HQDA is the MDA, any program on DOT&E oversight, and any program designated as 'special interest' by the Army T&E Executive. All TEMPs (and OTA Test Design Plans) submitted for approval by DOT&E must contain the following wording:

Note: Per the DOT&E policy memorandum "Independent Operational Test and Evaluation (OT&E) Suitability Assessments" dated 5 October 2012, for the OT, ATEC–AEC will evaluate operational suitability based solely on their independent scoring of reliability failures treating externally-generated failure definitions and scoring criteria as guidance only. The user representative, PM (MATDEV), and DT authorities may participate in the initial review of reliability failure reports in an effort to clarify relevant aspects of the failure. ATEC–AEC will perform an independent suitability evaluation documented in the assessment and/or evaluation report.

(b) The MDA is the TEMP approval authority for all programs not included in in paragraph 10–2*c*(4)(*a*).

(5) For DoD CBDP programs, the TEMP co-approval authorities are the CBDP T&E Executive and Joint PEO for chemical and biological defense.

(6) Per the DUSA–TE memorandum, subject: Army Test Synchronization, dated 29 October 2010, all Army acquisition programs must have an Army-approved TEMP containing the mandatory 'Test Synchronization' section in Part I and, if required, an Attachment 2 before the TSARC can approve their TRPs for inclusion in the FYTP. The only exception for requiring the 'Test Synchronization' section in Part I of the TEMP will be valid emerging test requirements so as to enable necessary early TSARC planning.

(7) The Milestone A TEMP, at a minimum, will discuss the possibility as to whether the system will be a candidate to undergo LFT&E. The more detailed LFT&E strategy will be documented in the approved updated TEMP in support of Milestone B.

(8) U.S. Food and Drug Administration (FDA) regulations describe the use of investigational drugs and biologicals and medical devices involving humans. (See 21 CFR Part 50, 21 CFR Part 56, 21 CFR 312, and 21 CFR 812). The U.S. Army Medical Research and Materiel Command, or any other sponsor of an investigational drug or biological, must file an Investigational New Drug (IND) Application with the FDA prior to the use of the product on human volunteers. Under certain conditions an IND may not be required (see 21 CFR 312.2(b)); in these cases investigators should seek U.S. Army Medical Materiel Development Activity or AHRPO advice on the applicability of the IND regulations to their studies. Medical devices may require the filing of an investigational device exception (IDE) with the FDA. Documentation of receipt of an IND authorization or exemption from an IND requirement (or approved IDE

or exemption from an IDE requirement) by the FDA, and an approval letter from a DoD Institutional Review Board that has reviewed the individual study protocols, will be submitted with each TRP covering tests with investigational products. (See AR 40–7 as general guidance.) Unless prohibited under DoDI 5000.02, this documentation replaces the TEMP requirement and provides authority for testing investigational drugs and biologicals, and medical devices in human volunteers.

(9) A TEMP is usually not appropriate for rapid acquisitions (that is, urgent and emergent operational needs) when there is minimal development work and minimal T&E to be conducted. While limited test planning is usually required (in collaboration with the supporting OT organization), a highly tailored and abbreviated TDP may be required by the MDA. The abbreviated TDP will describe a performance assessment approach that will include schedule, test types and environment, and assets required. An OT TDP for the required pre-deployment performance assessment is generally adequate. If the defense rapid acquisition program is on DOT&E oversight, a TEMP is also not normally required; however, the PM should prepare a combined OT and LFT TDP for DOT&E approval (see DoDI 5000.02, Enclosure 13).

d. TEMPs at Milestone A.

(1) In support of the developmental evaluation methodology, approved TEMPs should identify essential information on programmatic and technical risks, as well as information for major programmatic decisions.

(2) In support of the operational evaluation methodology, ATEC, as the Army's OTA, will ensure that approved TEMPs include a working link to a living document that contains the operational rationale for the requirements in the draft and/or final CDD or equivalent capability requirements document (see DoDI 5000.02, Enclosure 5).

(3) ATEC will include its assessment of the T&E implications of the initial CONOPS provided by the CAPDEV.

(4) TEMPs will include the evaluation approach for mission-level interoperability across key interfaces.

(5) Systems that provide capabilities for joint missions will be tested in the expected joint mission environment.

(6) TEMPs will document a strategy and budget resources for CEMA survivability T&E. At a minimum, software in all systems will be assessed for vulnerabilities by conducting a cooperative vulnerability and penetration assessment. Mission critical systems or mission critical functions and components will also require threat offensive cyberspace operations testing from an emulated threat in an operationally realistic environment during OT.

(7) TEMPs will include a table of independent variables (or conditions, parameters, and factors) that may have a significant effect on operational performance.

e. TEMPs at Milestone B.

(1) In support of the developmental evaluation methodology, approved TEMPs will include a developmental evaluation framework by identifying key data that will contribute to assessing progress toward achieving KPPs, CTPs, KSAs, interoperability requirements, cybersecurity requirements, reliability growth, maintainability attributes, DT objectives, and other attribute requirements and objectives, as needed.

(2) For hardware acquisition programs, approved TEMPs will include the required T&E data to support reliability growth and reliability growth curves for the whole system and the reliability of critical systems, subsystems, components, and subcomponents. If a single reliability growth curve is inadequate to describe the overall system reliability, reliability growth curves for critical subsystems, with rationale for their selection, will be provided. Reliability growth curves will consist of observed (when available) and projected reliability. TEMPs will include a working link to the failure mode, effects, and criticality analysis (FMECA) of identified or anticipated system failure modes, the impacted components and sub-components, and the method of failure mode discovery. A software defect/failure tracking databases may replace the FMECA in software acquisitions.

(3) For all Army programs not on OSD T&E oversight, the TEMP will include language that discusses the strategy to maximize use of all available reliability data in order to economize test scope and/or schedule, increase technical rigor, manage risk, and/or provide more information to support the system evaluation than would have been available in a traditional reliability test event. This language will discuss the planned data sources and planned reliability estimation methodologies. It will also include an adaptive, risk-based decision-making framework for use in determining which reliability estimation methodologies and data sources are appropriate to support the SEP, as well as the technical, programmatic, acquisition, and T&E decisions detailed in the developmental evaluation framework.

(4) Reliability estimation methodologies are not limited to traditional frequentist approaches, and may, where risk tolerance and rigor permits, include Bayesian methods and/or statistically-based test 'off-ramps' (wherein the test is halted when the test objective is met). The estimation methodologies should account for reliability improvement associated with applicable engineering testing and analyses, particularly the Design-for-Reliability (DfR) activities required by AR 702–19 such as Physics-of-Failure (PoF) studies and Highly-Accelerated Life Testing. In order to be permissible, the reliability estimation methodology under consideration must be technically sound and reflect OSD standards for statistical test and analysis techniques. Reliability estimation methodologies based on MIL–HBK–217 (and its derivatives) are not technically sound and should not be considered.

(5) Supporting data sources may include (but are not limited to) prior testing, testing on legacy or analogous systems, contractor testing, science and technology testing (including laboratories and validated simulator facilities), M&S, performance testing, and field data.

(6) For intensive software acquisitions, approved TEMPs will include projected and observed software maturity metrics.

(7) TEMPs will include a strategy and budget resources for CEMA survivability testing and analyses (that is, cooperative vulnerability and penetration assessment and adversarial assessment). The test programs will include, as much as possible, activities to test and evaluate a system in a mission environment with a representative cyber-threat capability. Appropriate measures will be included in the TEMPs and be used to evaluate operational capability to PDRR in order to sustain continuity of operations.

(8) TEMPs will document the validated threats to be used which should be selected based on the best current information available from the intelligence community.

(9) TEMPs will include updated tables of independent variables for the anticipated effects on operational performance, range of applicable values ("levels" and "settings"), overall priority of understanding the effects of the variable, and intended methods of controlling the variable during tests (uncontrolled variation, held constant, or controlled systematic test designs).

(10) TEMPs will document required safety releases and specific environment, safety, and occupational health (ESOH) test requirements to include verification of risk mitigation measures and risk acceptance (see DA Pam 385–16).

(11) TEMPs will address the ESOH planning strategy and requirements to support T&E, to include NEPA/EO 12114 compliance (see DA Pam 385–16).

f. TEMPs at Milestone C.

(1) In support of the developmental evaluation methodology, approved TEMPs will expand on the developmental evaluation framework in the approved Milestone B TEMP so as to show the correlation and mapping between test events, key resources, and the acquisition decision being supported.

(2) TEMPs will include updated reliability growth curves that reflect test results to date, any updates to the planned T&E for reliability growth, and a working link to the updated FMECA.

g. All approved TEMPs will contain a Requirements and/or Test Crosswalk Matrix as an attachment that links COIC, KPPs, analysis of alternatives, MOEs, MOPs, CTPs, and reference paragraphs of the CDD and/or CPD for a particular requirement with the actual test, or other data source, that will satisfy the CDD and/or CPD requirement. The purpose of the Requirements and/or the Test Crosswalk Matrix is to ensure that the system is not over-tested or under-tested. It should consist of all the test events listed in the integrated test program schedule contained in Part II of the TEMP.

h. All approved TEMPs will contain a Test Synchronization Opportunities Appendix when test synchronization opportunities exist. Developed by the Test Synchronization subgroup of the T&E WIPT, the mandatory appendix will contain as a minimum:

(1) An integrated schedule depicting which components of the operational view (OV)-1 will be considered in the test integration, to include distributed testing.

(2) A capability package discussion which addresses the linkage to specific capability packages and/or sets.

(3) An architecture assessment that summarizes the system and associated network high-level operational concept graphics OV–1, systems interface description system view (SV–1), and service view (SvcV–1) architecture implications to include aspects of Service, Joint, coalition, and mission partner interoperability (see DoDI 8330.01).

(4) A critical path listing the events, to include entrance and exit criteria, required for successful synchronization of system testing.

(5) The FYTP and/or TSARC impacts that describe issues requiring senior leadership involvement prior to semiannual publication of the FYTP.

(6) The limitations in areas that may impact characterizing the operational effectiveness of the systems, as well as measures to be taken to mitigate the limitations.

i. PMs will leverage early T&E involvement when developing program acquisition strategies. Early T&E involvement facilitates the timely scheduling of test assets (as well as the initiation of any investments in the existing DoD facility assets) required to support the program's test requirements. PMs should avoid investing in contractor T&E facilities or assets outside of exceptionable cases. The approved TEMP will thoroughly document when existing DoD test infrastructure does not meet a program's test requirements and when investment in the DoD test infrastructure would not be cost effective or schedule effective. The PEO must explicitly endorse any test infrastructure investment in contractor test facilities and assets. In turn, the PM must inform the ASA (ALT), the Army T&E Executive, and the ATEC well before programming or committing any associated funding.

j. RAM will be integrated within the systems engineering process and assessed during T&E (that is, during DT and OT). As the CAPDEV is responsible for proposing and/or defining COIC, they will ensure that reliability and maintainability information is reflected in requirements capability documents (CDD and CPD) and the TEMP. An engineering and manufacturing development phase reliability test threshold will be established when an ACAT I and ACAT II program sponsor has determined reliability to be an attribute of operational importance. This test threshold does not apply to IT systems that do not include hardware procurement or development. The planning models (based on projection methodology or other method as appropriate) of reliability growth planning curves and reliability test threshold are to be met or exceeded at the end of the first full-up integrated system-level DT in an early engineering and manufacturing development phase and must be established and approved as part of the Milestone B approved TEMP update and recorded in the acquisition program baseline. The reliability growth curve must be included in the Systems Engineering Plan, TEMP, and engineering and manufacturing demonstration phase contract. Reliability growth planning should consider the initial and goal reliability targets, test phases, corrective action periods, and reliability thresholds. It should also include realistic management metrics, such as management strategy and fix effectiveness factor. The operations and support costs must be assessed during the development of the reliability growth planning curve and must accompany all planned levels of reliability achievement. The approved TEMP will describe T&E planning for evaluating the reliability test threshold. As the chair for the impact assessment committee, in the event of a system reliability growth plan threshold breach, ATEC, in coordination with the PM, will provide the findings to the ASA (ALT) (see AR 702–19).

k. The process of developing, reviewing, and approving TEMPs will produce a valuable document satisfying the needs of all stakeholders and will ensure that important program milestones are not overlooked.

(1) The process will be implemented in accordance with the concepts of the DoD IPPD philosophy.

(2) The process will utilize the T&E subgroup (the T&E WIPT) of the integrating IPT as a working entity consisting of key process participants. The T&E WIPT is empowered to perform the work and make decisions that reflect the needs of all stakeholders.

(3) The policy, as described in paragraphs 10–2*b* and 10–2*c*, applies to all acquisition program TEMPs requiring HQDA approval. Other programs will use the TEMP process to document their T&E strategy; however, the TEMP format outline may be tailored.

(4) The T&E WIPT will develop the TEMP and will interact with the other subgroups of the integrating IPT in examining requirements and tradeoffs involving cost, schedule, and performance. In addition, in lieu of using "to be determined" (TBD) in the TEMP, the T&E WIPT will state the issue or facts currently available and the planned resolution date (that is, the date when the current TBD will no longer be a TBD).

(5) When feasible, the T&E WIPT chair should convene a meeting for the purpose of finalizing the TEMP. T&E WIPT members may convene after each member has been provided a final draft document with sufficient time for review by the member's chain of command. This review will ensure that the members' positions are sound and will not be overturned later. Coordination of the TEMP by the T&E WIPT at the final coordination meeting will be memorialized by the signatures of the members who are their organizations' authorized signatories on the T&E WIPT Coordination Sheet of the TEMP. The PM must attempt to resolve known issues prior to submitting the TEMP into the formal approval process. If unable to do so, the PM will highlight the issue and provide a recommendation to the appropriate decision maker prior to submitting the TEMP for approval.

(6) Upon receipt of a T&E WIPT-coordinated TEMP, as evidenced by a completed TEMP T&E WIPT Coordination Sheet, the PM signs the TEMP Approval Page and submits the TEMP into the formal TEMP Approval Process. No more than 30 calendar days will elapse between the signing of the TEMP by the PM and the approval signature by the Army TEMP approval authority.

(7) The PM will ensure that a fully coordinated TEMP, complete with all Army signatures on the TEMP Approval Page (except for the Army approval authority), is delivered to the Army approval authority for approval. Representatives of the PEO, CAPDEV or force modernization proponent, and ATEC are empowered to provide their concurrence signature on the TEMP Approval Page. For TEMPs containing a 'Test Synchronization Opportunities' appendix, the Director, System of Systems Engineering and Integration within ASA (ALT), will have concurrence signature authority on the TEMP Approval Page. A recommended goal is for all signatures to be obtained during the final T&E WIPT TEMP coordination meeting. The PEO must monitor the TEMP approval staffing and assist in the resolution of issues that may prohibit timely TEMP approval.

10–3. System evaluation plan

a. While documenting the integrated T&E strategy, the SEP identifies all evaluation needs to address operational effectiveness, operational suitability, and survivability and the test/simulation execution strategy that will be used throughout the system acquisition life cycle. It addresses system COIC, CTPs, and additional evaluation focus areas;

identifies data needs via a data source matrix; identifies important factors and associated conditions; identifies the test points required and justifies their placement in the test space to maximize the information obtained; specifies the analytical plan; and identifies program constraints. The SEP will establish a standardized test language, metrics, data dictionary, data methods, and database structure across DT and OT to reduce duplication of data collection during test events. The SEP addresses what needs to be known that can only be learned through testing in order to identify the required resources in the TEMP. The SEP provides guidance for development of the TEMP and TDPs, in that it details the system evaluator's planned actions for the system assessment and system evaluation of the system. The SEP is updated only, as needed.

b. The system evaluator prepares the SEP in coordination with the T&E WIPT. The SEP does not require T&E WIPT approval. It is approved by the command executing the evaluation, transmitted through the Army T&E Executive and forwarded to the DOT&E for information when the system is on DOT&E T&E oversight. For MDAP and MAIS programs, an approved SEP will be required prior to HQDA approval of the TEMP beginning at Milestone B (normally, program initiation). Accordingly, it can be assured that there is a complete traceability from the identified test data needs in the SEP to the specific tests reflected in the approved TEMP Part II (Integrated Test Program Summary).

c. A draft SEP will support the TEMP development required for Milestone A.

d. The SEP, along with the approved TEMP, provides guidance for development of TDPs.

10–4. Test design plan

a. A TDP that is developed and approved by the test organization responsible for the test documents the results of planning the test's methodology and the data collection, reduction and reporting processes required. The TDP is developed to ensure that the test will produce the required data as outlined in the approved SEP.

b. A TDP contains information on test design, factors and conditions, methodology, scenarios, instrumentation, simulation and stimulation, data management, and all other requirements necessary to support the evaluation requirements stated in the SEP.

c. A TDP may be developed for a specific test or a combination of tests as appropriate. It provides a detailed overview of the test concept and design with factors, conditions, and treatments that govern the test requirements. Some examples are independent variables, method of control, and constraints. The TDP will include any limitations that restrict the ability to obtain the required data. The content and degree of detail contained in the TDP must be sufficient to ensure the test is adequately planned, designed, prudently resourced, and will produce the required information.

d. Each TDP is approved within the T&E activity or command conducting the tests. For those programs on DOT&E oversight for OT and/or LF, the TDP will be transmitted through the Army T&E Executive for submission to DOT&E for approval. A test concept brief for an OT or major LFT will be provided to DOT&E as early as possible, but not less than 180 calendar days prior to the start of any such testing. DOT&E and the Army T&E Executive will be kept apprised of changes in test concept and progress on the TDP. The approved OT TDP will be submitted through the Army T&E Executive to DOT&E for approval not later than 60 calendar days before test start. The approved major LFT TDP will be submitted through the Army T&E Executive to DOT&E for approval not later than 90 calendar days before test start.

e. Barring significant unforeseen circumstances, all elements of an approved OT or LF TDP must be fully satisfied by the end of the OT or LFT. If an approved TDP cannot be fully executed, concurrence by the TDP approval authority with any changes must be obtained before revised tests can be conducted. After the start of an IOT or a LFT, deviations from the elements in the approved TDP cannot be made prior to the beginning of their execution without consultation with the OT commander and the concurrence of DOT&E when the program is on DOT&E oversight. Concurrence is not required when a need to change the execution of an element of the IOT TDP arises in real time (as its execution is underway). If on-site DOT&E representatives at the IOT are not present, and the test director concludes changes to the plan are warranted that would revise specific test events yet to be conducted, the test director must contact the relevant DOT&E personnel to obtain concurrence with the proposed changes. If it is not possible to contact DOT&E personnel in a timely manner, the test director can proceed with execution of the revised test events but must inform DOT&E of the deviations from the approved test design plan as soon as possible.

f. When the order of execution is identified in the approved TEMP as affecting the analysis of the data, TDPs should include details on the order of test execution and/or test point data collection.

g. TDPs must include the criteria to be used to make routine changes (delays for weather, test delay, test suspension, or test termination).

h. If required data for the IOT completion criteria are lost, corrupted, or not gathered, then the test is not complete unless the requirement is waived by the TDP approval authority.

10–5. Test and evaluation briefings to the Office of the Secretary of Defense

For a system on OSD T&E oversight, briefings relevant to T&E during the process leading to the Defense Acquisition Board review or overarching integrated product team (OIPT) will be conducted in accordance with the Defense Acquisition Guidebook.

10–6. Test and evaluation briefings to the Department of the Army

At a minimum, for any system that must be sent to HQDA for review, draft T&E reports authenticated by the responsible agency are required before reviews by the Army OIPT, AROC, and ASARC. The PEO or MATDEV chairs a T&E review 30 days before the acquisition milestone decision review. The purpose is for ATEC to present the adequacy of past tests, test results, and system assessment/system evaluation, and to plan for future testing (including critical issues, requirements, test plans, cost, schedule, and system readiness) and modifications of the test strategy to accommodate the evolving acquisition strategy and/or DBS Problem Statement. Inconsistencies and problems not resolved in this forum will be brought to the attention of the Army T&E Executive. The Army T&E Executive may request a separate T&E review.

10–7. Detailed test plan

A DTP is used to supplement the approved TDP with information required for day-to-day conduct of the test. It provides requirements for activities to be conducted to ensure proper execution of the test. The DTP is a document compiled by the activity responsible for test execution. While a formal DTP is not a DA requirement unless congressionally mandated or otherwise directed, detailed test planning is required by the test organization that performs the testing and is usually documented in the DTP.

10–8. Test resource plan

A TRP is a formal resource document prepared for TSARC validation (see chap 9). It is required for all events (such as tests, studies, investigations, experiments, demonstrations, tests and system assessments/system evaluations) that require Army or other Service operational assets. The TRP documents requirements for a specific event which supports the Army approved TEMP. TRPs will identify Soldier requirements for DT when Soldier participants or other operational resources are required (training ranges, OT instrumentation, flying hours, standard ammunition (DTs are exempt), or training devices). As the TSARC chair, additional TRP preparation guidance is issued by the CG, ATEC.

a. All acquisition programs (programs of record) must have an Army approved TEMP before they can compete in the TSARC process for resources and commitments to provide them.

b. All new and revised TRPs will be coordinated with the system's MATDEV before being submitted to the TSARC.

c. TRPs are prepared by the T&E organization and/or proponent (for example, ATEC, MEDCOM, RDECOM for experiments, MATDEV or PM for LDs, or TRADOC for a FDT/E) and are submitted to the TSARC for validation, prioritization, and sourcing.

10–9. Five-year test program

The FYTP is a compendium of TSARC recommended and DCS, G–3/5/7 approved TRPs in the following 5 years. The FYTP identifies validated requirements to support the Army's test programs. It is developed within the existing budget and program constraints in accordance with Army priorities. It is a tasking document for the current and budget years and provides test planning guidelines for the subsequent years.

10–10. Test incident and corrective action report

a. The MATDEVs, CAPDEVs, system evaluators, and other organizations participating in the acquisition process must be informed of system performance during tests in a timely manner so that corrective actions may be initiated and a system assessment and system evaluation may be conducted.

b. DA Form 7492 (Test Incident Report) (TIR) describes the minimum essential data for test incidents as they occur, the respective corrective actions and status, and other test information. The DA Form 7492 TIR form and data stream formats will be used for reporting these data for all pre-FRP/FD tests and for tests in production and deployment supporting a materiel release decision. TIRs are required for all tests in the approved TEMP and are entered electronically into the ATIRS. Projects must be entered and access must be granted prior to submittal. Contact the ATIRS Help Desk for further information on the requirements and options for TIR submittal available at https://vision.atc.army.mil/.

c. Critical and major TIRs require the production of corrective action data. All other TIRs will be reviewed for possible corrective action. A corrective action review team will review all corrective action data to verify that all

proposed corrective actions are appropriate and effective. The MATDEV, CAPDEV, and the system evaluator compose the corrective action review team. The testers serve as advisors.

d. Test incident corrective action data, with the exception of classified data, will be entered electronically promptly by the MATDEV into the ATIRS to enable all members of the T&E community access to the data and information in a timely manner. The data will also be provided to others in accordance with agreements reached by the T&E WIPT, in coordination with the PM.

10–11. Developmental test readiness statement

The DT readiness statement is a written statement prepared by the chair of the DT readiness review as part of the minutes. The statement documents that the materiel system is ready for the PQT or that the C4 and IT systems are ready for the SQT.

10–12. Operational test readiness statement

An OTRS is a written statement prepared by the CAPDEV, the MATDEV, the trainer developer or trainer, and the test unit commander before the start of OT for use during the OTRR. Each OTRS addresses or certifies the readiness of the system for testing in each member's area of responsibility. OTRSs may also be required for some FDT/E and should be specified in the TRP. OTRR membership and frequency of conduct are found in the DA Pam 73–1. For capability sets that require integration and are identified to participate in a network integration evaluation or capabilities integration event, the CG, Brigade Modernization Command will approve the OTRS to ensure that the operational and tactical integration meets Army and TRADOC (user representative) needs. OTRSs are presented during OTRR three to certify the readiness of the system for OT in each written statement's area of responsibility, and to convey that the system has a reasonable chance to successfully complete the OT. An OTRS also may be required for some FDT/E. The TRP will specify when OTRSs are required.

10–13. Test reporting

a. Developmental test reporting.

(1) A DT TR is a formal document of record that reports the data and information obtained from the DT and describes the conditions that actually prevailed during test execution and data collection. It may be an interim data report, final test report (FTR), or a test record. An interim data report is required 45 days from the end of the DT. The final DT TR, completed within 60 days after conclusion of the DT, includes an audit trail of deviations from the planned testing. A DT may be conducted and reported by the system contractor. In these cases, a system contractor test plan must be coordinated with the T&E WIPT. For the system contractor test results to be considered by the Army T&E community, the system contractor test must be observed by Army T&E test expert and professional personnel to validate the data for inclusion in the system assessment and evaluation.

(2) The lead DT&E organization for MDAPs will report DT results to the chief developmental tester to assist in reaching technically informed, objective judgments and support decision points per the developmental evaluation framework in the approved TEMP. The chief developmental tester will submit these reports through the Army T&E Executive to the DASD (DT&E), per DoDI 5134.17.

b. Operational test reporting.

(1) *Operational test report.* The OT TR documents test results, observations, and recommendations. It consists of a description of the test, actual test conditions, and test limitations and impacts. The OT TR is completed within 60 days after the conclusion of the OT, and will contain the level of the aggregation of data and supporting analyses required by the approved OT TDP.

(2) *Abbreviated operational test report.* In addition to the OT TR, the Abbreviated OT Report provides the test organization with a medium for documenting information on the test description, actual test conditions, test limitations, test team observations, and a Level three (authenticated) test database. It is completed within 30 days after the completion of record testing.

(3) *Authenticated Test Database.* The test organization will distribute authenticated data to identified users as soon as possible, but not later than 10 days after completion of the OT record trials.

c. Test data retention. For ACAT I & II programs, all reliability and maintainability data resulting from DTs, integrated testing, and OTs will be retained by the PM and/or MATDEV.

d. Test reporting. All TRs and their supporting data and metadata will be provided to the Defense Technical Information Center. If there are limitations in the data or metadata that can be provided to the Defense Technical Information Center, they will be documented in the approved TEMP starting at Milestone B. Test agencies will provide a descriptive summary to the DoD Modeling and Simulation Coordination Office, along with the metadata for all accredited M&S that can potentially be reused by other programs.

10–14. Live fire test and evaluation documentation

a. A LFT&E strategy will be developed for each program designated by DOT&E for LF oversight. The LFT&E strategy is approved as an integral part of the TEMP via the TEMP approval process with DOT&E.

b. In the case of DOT&E LF oversight programs that do not require a TEMP to be provided to HQDA and OSD for approval, the LFT&E strategy is forwarded separately through the Army T&E Executive for approval and submission to DOT&E for approval (see para 4–3*j*).

c. The type of pre-shot predictions required, along with the reporting format and submission timeline, will be identified in the LFT&E Plan Matrix in the approved TEMP. Prior to the LFT, pre-shot predictions of expected LFT outcomes will be prepared by USASMDC/ARSTRAT for strategic missiles and by ARL/SLAD for all other systems. The pre-shot prediction reports (typically required for FUSL tests only) are submitted through the Army T&E Executive to DOT&E for information purposes.

d. FUSL LFT results are contained in the final TRs, and evaluation findings and recommendations are contained in the SER. For systems on DOT&E oversight for LF, the final FUSL LF TRs are provided through the Army T&E Executive for submission to DOT&E for information. For all other FUSL LFTs, the testing agency approves the LF TRs. The SER is approved by the Commander, ATEC (or designee) and is submitted through the Army T&E Executive for submission to the DOT&E for information.

10–15. Evaluation and assessment reporting

a. Evaluation and assessment reporting. Reports document independent findings and recommendations of system operational effectiveness, operational suitability, and survivability. As the Army's OTA, ATEC will report OT&E results in a SER at the FRP/FD decision review. Independent reporting will be required earlier than the FRP/FD decision review if an EOA report or OA report is prepared. CEMA survivability evaluations will be documented in the overall system SER. The SER is available at least 30 days prior to the milestone, and it addresses and answers the CTPs, COIC, and additional evaluation focus areas in the SEP based on all available credible data and the system evaluator's analytic treatment of the data. A system analysis report provides the detailed analyses, including the results of M&S that support an EOA, OA, or SER. A system analysis report accounts for all issues and measures contained in the SEP. While the basic premise of the type threat to be examined in T&E is established through the STAR, the threat may evolve over time causing the threat actually examined in T&E to change from what was originally planned. Accordingly, the SER will include an identification of whether the system will be survivable when fielded in addition to whether it meets the original criteria available at program initiation.

b. Assessment report. These reports consist of EOAs and OAs which provide input to Milestone B and Milestone C, respectively, and non-milestone decisions (such as decision points, interim progress reviews, materiel release, or upon request) from the system's stakeholder. The scope of issues to be addressed by the EOA and OA reports is flexible in that it may or may not cover all aspects of a system's operational effectiveness, operational suitability, and survivability. A system analysis report is also prepared to support an EOA or OA report when the analysis is too detailed or inappropriate for inclusion in the EOA or OA report.

c. Human systems integration evaluation. The HSI evaluation report consists of the overall findings from the HSI analysis, HSI incident report, and HSI assessment. The HSI evaluation report documents independent and integrated analysis findings, as well as recommendations from the seven domains: manpower, personnel, training, human factors engineering, Soldier survivability, health hazards, and system safety.

d. Materiel release position memorandum. A memorandum to the PM containing a recommendation for full, conditional, or no materiel release of the system. Any system shortcomings or deficiencies gaining in the recommendations form the basis for the Conditional Materiel Release Get-Well Plan (see AR 770–2 and AR 770–3).

10–16. Logistics demonstration documentation

a. Logistics demonstration plan. The MATDEV develops a LD plan in conjunction with the Supportability subgroup of the T&E WIPT. The LD plan includes the nondestructive disassembly, reassembly, diagnostics and prognostics demonstration of a production representative materiel using its required test measurement and diagnostic equipment, tools, training devices, technical publications and support equipment. The LD will address operator, field maintenance, and remove and replace tasks; preventive maintenance checks and services; troubleshooting; and diagnostics and prognostics. The diagnostics and prognostics demonstration will address 100 percent of all known critical faults introduced into the equipment individually according to the FMECA. Additional faults will be introduced into the equipment individually according to the FMECA through a random process weighted to represent predicted failure rates. MIL–HDBK–470 may be used as a reference to determine fault insertion sample size and methodology (see AR 700–127).

b. Logistics demonstration test resource plan. A LD that requires resources such as Soldier participants and the gaining unit's table of organization and equipment must have a TRP submitted to the TSARC for coordination, validation, and tasking (see chap 9).

c. Logistics demonstration report. The PEO, PM, and/or MATDEV develops a LD report in coordination with the Supportability WIPT and the T&E WIPT. The report documents results of the LD including specific task results, supporting analysis, and comments from demonstration players and data collectors, as well as evaluates training aids, devices, simulators, and simulations (TADSS). The LD report will be completed 30 days after conclusion of the LD.

10–17. Cyber electromagnetic activities test and evaluation documentation

a. Cyber Electromagnetic Activities Survivability Strategy. The CEMA survivability T&E strategy will be developed for each system that processes information and will be an integral part of the approved TEMP.

b. Cyber Electromagnetic Activities Cybersecurity and Electronic Protection Test Design Plan. Each CEMA Cybersecurity and Electronic Protection TDP will document data needs, test procedures, and data acquisition plans.

c. Cyber Electromagnetic Activities Cybersecurity and Electronic Survivability Assessment. Each assessment provider will document findings in the following reports:

(1) *Cooperative vulnerability and penetration assessment.* The cooperative vulnerability and penetration assessment team develops the cooperative vulnerability and penetration assessment document in conjunction with the CEMA survivability subgroup of the T&E WIPT. The cooperative vulnerability and penetration assessment documents the configuration of the system, the test environment (operational or developmental), TTP analysis, security compliance, and vulnerabilities discovered. The cooperative vulnerability and penetration assessment also documents the results of the penetration test to include specific task results, system reactions, user actions, and impacts to missions and system functionality.

(2) *Threat offensive cyberspace operations report.* The threat offensive cyberspace operations team develops the threat offensive cyberspace operations report which includes the specific threat offensive cyberspace operations team's actions, observed friendly force actions, system reactions, and impact to mission and system functionality.

(3) *Protect, detect, react, and restore reports.* The PDRR analysts develops the PDRR report which addresses the friendly actions to protect, detect, and react to the red team activities, and actions to restore information and services following a cyberspace attack.

(4) *Electronic warfare analysis report.* ARL/SLAD develops the electronic warfare analysis report which includes the technical analysis of the system effectiveness and reliability in the presence of hostile electronic attack or electronic warfare support, including the technical effects of electronic warfare, the impact to mission, and the severity of hostile electronic warfare during the test.

(5) *Evaluation findings.* The CEMA survivability evaluation findings are documented in the system EOA reports, OA reports, and SERs.

d. Cyber electromagnetic activities developmental test results briefing. ATEC will brief the AROC and ASARC on DT results of CEMA at Milestones B and C to ensure that software, hardware, and firmware development is secure to proceed to OT.

Chapter 11
Test and Evaluation Budget and Financial Considerations

11–1. Test funding

a. The policy addressed in this chapter pertains to funding for T&E of systems and mission support equipment (including Army test ranges and facilities).

b. In general, the Army RDT&E appropriation will fund testing accomplished for a specific system before the LRIP production decision (Milestone C). APAs and/or OMA funds are used for testing done after the FRP decision review. The MATDEV will fund the testing of system changes using the same appropriation that funds the development itself. The MDA will determine which appropriation to use per the program office's signed/approved Acquisition documentation (for example, acquisition strategy and acquisition program baseline) and specifically justified in the budget request documentation (that is, P-Forms and T-Forms).

c. T&E funding for modifications (product improvements or preplanned product improvements of legacy systems and engineering change proposals) will be the same as the appropriation used to affect the modification.

d. Testing to support concept exploration and formulation for materiel is funded with RDT&E appropriations.

e. Testing to support doctrine, organization, training, and materiel requirements generation is funded from OMA appropriations.

f. The MATDEV will plan, budget, and allocate appropriate levels of test funding for all DTs and OTs of ACAT I–III systems that are identified in the approved TEMP. The MATDEV will clearly identify funding associated with specific system T&E (including test instrumentation, targets, and threat simulators) in the initial system acquisition cost estimates, acquisition plans, and the TEMP. For targets and threat simulators (threat representations), the test costs include the development of the threat TSP, threat representation accreditation, and the threat portrayal associated with each test (for those tests requiring a validated and accredited threat representation and portrayal). For DTs, these threat representation test costs occur when the plan calls for the threat derived data to be rolled forward to support an acquisition milestone decision. These threat representation test costs occur in every OT. Each T&E WIPT will address threat representation test costs during periodic reviews and adjust them as needed to meet projected test requirements. The MATDEV will develop estimates of costs associated with replacement, repair, or refurbishment of tested equipment and other resources used during testing and will ensure that they are addressed in the approved TEMP.

g. Test agencies will plan and budget funds for their nonsystem-specific mission support equipment (for example, threat simulators and instrumentation) used for general test conduct.

h. Instrumentation required or consumed in a particular test or used solely to support testing of a particular item will be considered test-specific and will be charged to the funds financing the conduct of the test. The MATDEV will identify costs associated with system-specific items of instrumentation (including interface devices to provide connectivity to generic instrumentation systems) in the initial system acquisition cost analysis and resource requirements addressed by the T&E WIPT during TEMP development. Funding for such instrumentation will be included in the system acquisition costs and provided to test organizations in advance of scheduled tests to ensure that instrumentation is available to support those tests.

i. Commercial instrumentation that is used in an OT or FDT/E conducted at other than RDT&E financed facilities may be financed using RDT&E, other procurement, Army (OPA), or OMA funds based on investment expense criteria if such items are not test-specific as discussed above. In general, if two or more tests can be conducted using the required commercial instrumentation, simulators, or facilities, mission-support equipment funds should be used. OPA and OMA funds (subject to investment expense criteria) may be used to procure standard or nonstandard instrumentation or NDI special purpose equipment if no RDT&E-funded engineering redesign, testing, or evaluation is required.

j. If clarification is required because of unique circumstances, or because of a conflict between this regulation and other fiscal regulations such as DoD 7000.14–R, DoD Financial Management Regulation (FMR), Volume 2A, Military Personnel and Operation and Maintenance Budget Exhibit Guidance or Defense Finance and Accounting Service Indianapolis Center (DFAS–IN) Manual 37–100, then the user should seek a ruling from the proponent of DoD 7000.14–R. Chapter A0–2040 (RDT&E, Army) of the Army Management Structure (Federated Enterprise Resource Planning Business Systems) is published annually; the current fiscal year version is available at https://www.asafm.army.mil/.

k. All entities requesting units, Soldiers, civilians, equipment, or other assets will provide the necessary funding required to support an experiment, investigation, demonstration, study, test, system assessment, or system evaluation. Funding reimbursement includes, but is not limited to, the supporting commands' additional operations (due to increased operational tempo), temporary duty, transportation, shipment of equipment, flight hours, facilities, ranges, and instrumentation.

11–2. Funding to conduct development testing

a. The MATDEV will program and budget direct cost funds (RDT&E or OMA/APA) required to conduct DT based on the requirements in the approved TEMP and in accordance with AR 70–1.

b. The MATDEV and other DoD users will reimburse the test activity for all direct costs incurred when using a component of the DoD MRTFB inventory when those costs can be readily identifiable to a specific DoD test program (see DoDD 3200.11 an DoDI 3200.18). For testing in non-MRTFB facilities by for non-DoD customers, the users will reimburse the test activity for all direct costs that can be readily identified to a specific test program and any associated indirect costs (see 10 USC 2539b and DoDI 7000.14–R, Volume 11A, Chapter 12).

c. Other government agencies and, when authorized, private organizations and commercial enterprises will be charged according to MRTFB guidance reflected in paragraphs 7–3 and 7–4 and DoD 7000.14–R, Volume 11A, Chapter 12.

d. Testing conducted under foreign military sales cases will be reimbursed according to DoD 7000.14–R, Volume 15, Chapter 7, Section 070408.

e. Forecasting for developmental testing anticipated to be conducted at an Army test facility is documented via ADSS. All direct costs associated with the planning and conduct of such testing are normally funded by the MATDEV using the appropriation most suitable for the actual life cycle phase.

(1) TFT costs and component costs will be funded by RDT&E appropriations, including the costs of procuring and modifying test samples and purchasing or preparing technical or production packages (including manufacturer's publications, when necessary), repair parts, special tools, test measurement and diagnostic equipment, support equipment, training, and temporary duty of test personnel.

(2) EDT, PPT, PQT, LFT, and LD will be funded by RDT&E appropriations, including costs of procuring test samples and prototypes, support equipment, transportation, technical data, training of test personnel, repair parts, and test specific instrumentation, equipment, and facilities.

11–3. Funding to conduct operational testing

a. All OT activities (for example, services, support, and test ranges) are RDT&E funded.

b. The MATDEV, the ATEC (for multi-Service OT&E, OT&E for which there is no Army PM, and JT&E), other OT activities, and TRADOC normally fund OT costs.

(1) IOT costs will be funded by the RDT&E appropriation.

(2) FOT costs will be funded by the appropriation most fitted to the life cycle phase of the system involved.

(3) EUTs and concept experimentation tests costs in support of materiel acquisition will be funded by the RDT&E appropriation.

(4) LUTs costs will be funded by the appropriation most fitted to the life cycle phase of the system involved.

(5) Unless prohibited under 10 USC 2399 or 10 USC 2366, test requirements costs not documented in the approved TEMP will be funded by the requiring activity.

(6) Costs of prototypes and a limited number of test items purchased or leased for IOT purposes will be funded by the MATDEV using RDT&E funds.

(7) Standard items not available to the activity performing operational testing will be loaned from the inventory of other organizations as contained in the TRP of the approved FYTP for use in FDT/E and FOT. Modification of standard items for test purposes will be financed with funds obtained for the test. Any refurbishment to return items leased or loaned from inventory back to an issuable condition or the replacement of leased or loaned items that cannot be economically refurbished will be financed with test funds.

c. The RDT&E appropriation applies to OTs conducted pre-LRIP or pre-FRP/FD decision (see chap 5). It also applies to OTs of RDT&E funded system changes (modifications and upgrades) to a system prior to the decision to start production or fielding.

d. The OMA appropriation applies to post-FRP/FD decision review OTs during acquisition and to the OTs of non-RDT&E funded system changes (modifications and upgrades) (for example, FOTs).

e. The PM/PEO will program and budget for OTs (EUTs, LUTs, IOTs, and FOTs). All OTs are funded according to Army budget priorities. Unless prohibited under 10 USC 2399 or 10 USC 2366, the requesting agency will also fund any OT submitted to the TSARC for out of cycle approval, regardless of ACAT level and applicable appropriation.

11–4. Funding to support system evaluation

a. While RDT&E funds are normally used to support system evaluation, the agency providing such funds will determine the appropriation most suitable for the actual lifecycle phase. Evaluation of a specific test and CE throughout the system life cycle is funded by RDT&E. Examples of items funded are analyses of test data, M&S efforts, HSI, evaluation of embedded software, contractor technical services, methodology studies, and early T&E.

b. Funds required to conduct CE for costs associated with the evaluation of FYTP systems from the technology maturation and risk reduction phase through the production and deployment phase are programmed by ATEC (except for all direct costs).

11–5. Funding to support test and evaluation of commercial items, nondevelopmental items, and foreign comparative testing programs

a. Per DoD 7000.14R (FMR) Volume 2a, Chapter 1, section 010209, all commercial off-the-shelf (COTS) and NDI procurement items, including the first article and associated first article acceptance testing, should be funded in the procurement or operation and maintenance appropriations, as determined by the Expense and Investment criteria. If an end item requires design and development in order to accept the COTS or NDI, or if OT&E is required to determine military suitability and effectiveness; or if LFT&E is required to determine whether the COTS/NDI possesses survivability and lethality characteristics needed by operational forces, then the entire effort is not COTS or NDI, and funding for that effort should be budgeted in RDT&E. If a COTS or NDI is required for RDT&E test purposes, the cost is funded in RDT&E.

b. Prior to Milestone C, the MATDEV will budget and provide funds (normally using RDT&E appropriations) for the following commercial items and NDI efforts:

(1) Market research to include written reports based on literature searches and acquisition of materiel (procurement or lease) for limited TFTs for the purpose of compiling reports to assist in defining the performance characteristics to be incorporated into performance specifications.

(2) Engineering, design, integration, testing or evaluation required to modify NDI equipment in order to meet unique military requirements that increase the performance envelope of the existing NDI equipment.

(3) Procurement of NDIs and the conduct of T&E for purposes of selecting which items will be classified as standard or as approved for service use.

(4) Procurement and testing of NDI systems for the purposes of conducting PQTs.

(5) Operational testing of NDI systems to include EUTs, LUTs, and IOTs.

c. Funds required to support T&E of foreign comparative testing programs are provided by OSD through the foreign comparative testing program.

11–6. Funding to support system changes

Funding for testing of system changes (modifications and upgrades) is to be the same type of appropriation used for the funding of the system changes.

11–7. Funding to support low-rate initial production testing

Funding for testing LRIP items needed for use in further testing will be procured with RDT&E funds. (See 10 USC 2399.) Such items may be refurbished for entry into the operational inventory, via the national inventory control point controlled stocks, when testing is complete using APA funds, if approved.

11–8. Funding to support materiel required for testing

a. The MATDEV will requisition standard or adopted equipment that is not available to the tester from national inventory control point controlled stock through normal Military Standard Transaction Reporting and Accounting Procedures to support all types of tests. Test agencies will help coordinate such actions when required. All such loaned equipment will include designated basic issue. The MATDEV will use the appropriate direct-test funds to repair or refurbish economically repairable equipment before returning it to national inventory control point controlled stocks. The MATDEV will reimburse costs of loaned items that are consumed, destroyed, or damaged beyond economical repair to the lending agency using appropriate direct-test funds. The MATDEV will finance costs of transporting nonstock, standard or adopted materiel to and from the designated testing point with OMA (second destination transportation) funds. The MATDEV will use test funds to finance costs of transporting all loaned stock, fund-owned parts (Army working capital fund). (See para 11–3*b*(7).)

b. The MATDEV will provide funds to the responsible tester to procure non type-classified equipment and repair parts and nonstandard consumables required in connection with the approved TEMP for DTs, OTs, MOT&E, and FDT/E. All repair parts for nonstandard investment items and all nonstandard consumables will be procured with the funds financing the conduct of the test.

c. Costs of modifying test items and subsequent rehabilitation and return to stock will be funded by the same source that funded the test.

d. The MATDEV will forecast the flying hours needed for DTs, OTs, FOTs, MOT&E, and FDT/E and will document it in the TRP.

e. The MATDEV will forecast the ammunition needs for DTs, OTs, MOT&E, and FDT/E. All ammunition requirements will be submitted through DCS, G–3/5/7 for resourcing through the Total Army Munitions Requirements Process (see AR 5–13).

(1) Procurement appropriations will provide consumable rounds of standard ammunition and tactical missiles required in support of DTs and OTs. This will be done without reimbursement when authorized by the weapons program.

(2) All developmental and nonstandard munitions required for RDT&E are funded by the RDT&E appropriation.

(3) Sections (1) and (2) of this sub-paragraph e will not be interpreted to cause a deviation from the statutory budgetary guidance given in 10 USC 2366 or 10 USC 2399.

f. As the lead Army agency for consolidating RDT&E munitions requirements for all Army tests involving standard Army munitions, ATEC will submit the Army's near year and out year munitions test requirements to DCS, G–3/5/7 (Munitions Management Division) for validation and resourcing (see AR 5–13).

g. The MATDEV will plan, program, and budget for targets and threat simulators to support specific system testing. Test agencies and PM ITTS institutional funding, or funding from OSD, will provide the funding for their respective general mission requirements.

11–9. Funding to support acquisition of test agencies, activities, or proving ground mission support equipment

a. Test organizations may acquire ITTS and facilities to provide general support test mission capabilities. These organizations may use RDT&E, APA, and/or OMA funds for this purpose, as distinguished below. A test organization's multi-application mission instrumentation will be developed with RDT&E funds. Either the test organization or PM ITTS will provide these funds. The test organization may use APA funds to obtain separately procurable subsystems (for example, trucks) and modules (for example, NDI) that require no modifications before being integrated into an instrumentation system. Test organizations may use operating funds, either OMA or RDT&E, to procure standard equipment, replacement components, and standard instrumentation in support of mission testing. Test organizations will normally use APA funds to procure standard and/or nonstandard instrumentation that has been previously developed or is currently available from a commercial source, a foreign country, or another Service. Test organizations will then use instrumentation, threat simulator, or mission funds (for example, RDT&E) to install the appropriate instrumentation on the APA-procured item. The dollar restriction on the use of OMA or APA funds to procure instrumentation should be based on the Army's expense/investment criteria.

b. Mission equipment developed and acquired under this paragraph will not be type-classified or funded under the purview of AR 70–1 and AR 71–9 for weapon system development and issue. In addition, this equipment is not considered part of the test article system and its accompanying test support for weapon system acquisition.

11–10. Equipment procurement and accounting

a. Test organizations' RDT&E and APA procured instrumentation is exempt from the procurement requirements of AR 750–43. Instrumentation calibration requirements will be structured according to AR 750–43. (See definition of test instrumentation in the glossary.)

b. This regulation authorizes property accountability (for example, property book), as described in AR 710–2, of RDT&E and APA-funded test instrumentation.

c. Audio and video equipment is considered instrumentation when procured by RDT&E and APA funds to support testing. Therefore, they are excluded from the special procurement requirements for public information, schools, and Adjutant General use at installations.

d. Automated data processing equipment, funded through test organizations' RDT&E or APA programs and classed as instrumentation, is exempt from AR 25–1. Rather, this classification of automatic data processing equipment falls under the auspices of scientific and engineering applications in support of materiel acquisition.

e. Equipment modifications to nonstandard (non-type-classified) equipment obtained to support testing are excluded from the materiel change, configuration management, and modification of materiel guidance contained in AR 750–10. The test organization using the item is responsible for changes or modifications to nonstandard items. Modifications to standard (type-classified) equipment on the test organization's tables of distribution and allowances, or borrowed equipment, will be performed as prescribed in AR 750–10.

f. After obtaining verification from the test site host, test organizations may support testing through lease or procurement of commercial-type equipment, including vehicles, when internal capabilities are exceeded or when required military-type equipment or vehicles are not available through normal channels (for example, through GO TSARC allocations). Leases may be handled by local contracting arrangements or through the General Services Administration. Test activities may also obtain equipment or vehicles from the Defense Reutilization and Marketing Service to satisfy RDT&E test mission support (see generally, AR 71–32).

Appendix A

References

Section I

Required Publications

The following publications are available on the APD website (https://armypubs.army.mil), unless otherwise stated. DoD publications are available at https://www.esd.whs.mil/dd/. USCs are available at https://uscode.house.gov/.

AR 5–13
Army Munitions Requirements, Prioritization, and Authorizations Management Policy (Cited in para 2–7*k*.)

AR 25–2
Army Cybersecurity (Cited in para 4–3*i*(5).)

AR 40–7
Use of U.S. Food and Drug Administration–Regulated Investigational Products in Humans Including Schedule I Controlled Substances (Cited in para 10–2*c*(8).)

AR 70–1
Army Operation of the Adaptive Acquisition Framework (Cited in the title page.)

AR 70–41
Armaments Cooperation (Cited in para 3–17*b*.)

AR 200–1
Environmental Protection and Enhancement (Cited in para 1–5*p*.)

AR 525–29
Force Generation - Sustainable Readiness (Cited in para 2–1*i*.)

AR 702–19
Reliability, Availability, and Maintainability (Cited in para 2–3*f*.)

Chapter A0–2040 (RDT&E, Army) of the Army Management Structure
(Federated Enterprise Resource Planning Business Systems) (Cited in para 11–1*j*.) (Available at https://www.asafm.army.mil/dfas-guidance/army-management-structure-guide/.)

DFAS–IN Manual 37–100
Financial Management–Army Management Structure (see current Fiscal Year) (Cited in para 11–1*j*.) (Available at https://www.asafm.army.mil/dfas-guidance/dfas-in-manual-37–100/.)

DoD Integrated Product and Process Development Handbook
(Cited in para 8–1*b*(5)). (Available at https://www.secnav.navy.mil/rda/onesource/documents/program%20assistance%20and%20tools/handbooks,%20guides%20and%20reports/page%203/ippdhdbk.pdf.)

DoD 7000.14–R
Department of Defense Financial Management Regulation (Cited in para 7–3*a*.) (Available at https://comptroller.defense.gov/fmr/.)

DoDD 3200.11
Major Range and Test Facility Base (MRTFB) (Cited in the title page.)

DoDD 5000.01
The Defense Acquisition System (Cited in the title page.)

DoDI O–3600.03
Technical Assurance Standard (TAS) for Computer Network Attack (CNA) Capabilities (Cited in para 2–6*i*(7)(*a*).)

DoDI 3200.18
Management and Operation of the Major Range and Test Facility Base (MRTFB) (Cited in para 7–3*a*.)

DoDI 3216.02
Protection of Human Subjects and Adherence to Ethical Standards in DoD-Conducted and -Supported Research (Cited in para 2–11*c*.)

DoDI 5000.02
Operation of the Adaptive Acquisition Framework (Cited in the title page.)

DoDI 5134.17
Deputy Assistant Secretary of Defense for Developmental Test and Evaluation (DASD(DT&E)) (Cited in the title page.)

DoDI 8330.01
Interoperability of Information Technology (IT) including National Security Systems (NSS) (Cited in para 4–3*h*.)

DoDI 8500.01
Cybersecurity (Cited in para 5–3*e*.)

DoDI 8510.01
Risk Management Framework (RMF) for DoD Information Technology (IT) (Cited in para 6–4*j*.)

10 USC 139
Director of Operational Test and Evaluation (Cited in para 1–5*h*.)

10 USC 1706
Government performance of certain acquisition functions (Cited in para 1–5*h*.)

Section II

Related Publications

A related publication is a source of additional information. The user does not have to read a related reference to understand this publication. USCs are available at https://uscode.house.gov/. CFR material is available at https://www.ecfr.gov/.

ADP 7–0
Training

AR 5–1
Management of Army Business Operations

AR 5–11
Management of Army Models and Simulations

AR 5–22
The Army Force Modernization Proponent System

AR 10–87
Army Commands, Army Service Component Commands, Direct Reporting Units

AR 11–2
Managers' Internal Control Program

AR 15–1
Department of the Army Federal Advisory Committee Management Program

AR 25–1
Army Information Technology

AR 25–30
Army Publishing Program

AR 40–5
Army Public Health Program

AR 40–10
Health Hazard Assessment Program in Support of the Army Acquisition Process

AR 40–60
Army Medical Materiel Acquisition Policy

AR 70–25
Use of Volunteers as Subjects of Research

AR 70–31
Standards for Technical Reporting

AR 70–38
Research, Development, Test and Evaluation of Materiel for Worldwide Use

AR 70–62
Airworthiness of Aircraft Systems

AR 70–75
Survivability of Army Personnel and Materiel

AR 71–9
Warfighting Capabilities Determination

AR 71–32
Force Development and Documentation Consolidated Policies

AR 350–38
Policies and Management for Training Aids, Devices, Simulators, and Simulations

AR 380–381
Special Access Programs (SAPs) and Sensitive Activities

AR 381–11
Intelligence Support to Capability Development

AR 385–10
The Army Safety and Occupational Health Program

AR 602–2
Human Systems Integration in the System Acquisition Process

AR 700–127
Integrated Product Support

AR 710–2
Supply Policy Below the National Level

AR 750–1
Army Materiel Maintenance Policy

AR 750–10
Army Modification Program

AR 750–43
Army Test, Measurement, and Diagnostic Equipment

AR 770–2
Materiel Fielding

AR 770–3
Type Classification and Materiel Release

CJCSI 5123.01I
Charter of the Joint Requirements Oversight Council (JROC) and the Implementation of the Joint Capabilities Integration and Development System (Available at https://www.jcs.mil/.)

CJCSI 6510.01F
Information Assurance (IA) and Support to Computer Network Defense (CND) (Available at https://www.jcs.mil/.)

DA GO 2008–06
Establishment of the U.S. Army Test and Evaluation Office

DA Pam 70–3
Army Acquisition Procedures

DA Pam 73–1
Test and Evaluation in Support of Systems Acquisition

DA Pam 385–16
System Safety Management Guide

DAU Glossary of Defense Acquisition Acronyms and Terms
(Available at https://www.dau.edu/glossary.)

DCS, G–3/5/7 memorandum, subject: Interim Policy Memorandum–Nonstandard Equipment (NSE) Army Requirements Oversight Council (AROC) Process, 4 June 2015

Defense Acquisition Guidebook
(Available at https://aaf.dau.edu/guidebooks.)

DOT&E TEMP Guidebook 3.1
(Available at https://www.dote.osd.mil/guidance/dot-e-temp-guidebook/.)

DUSA–TE memorandum, subject: Army Test Synchronization, dated 29 October 2010

EO 12114
Environmental effects abroad of major Federal actions (Available at https://www.archives.gov/federal-register/executive-orders/disposition.)

FAR
(Available at https://www.acquisition.gov/.)

FM 3–12
Cyberspace Operations and Electromagnetic Warfare

JCIDS Manual
Manual for the Operation of the Joint Capabilities Integration and Development System (Available at https://www.dau.edu/cop/iam/documents/dod-jcids-manual-oct-21.)

JP 2–0
Joint Intelligence (Available at https://www.jcs.mil/.)

JP 3–0
Joint Operations (Available at https://www.jcs.mil/.)

JP 3–12
Joint Cyberspace Operations (Available at https://www.jcs.mil/.)

Memorandum of Agreement on Multi–Service Operational Test and Evaluation (MOT&E) and Operational Suitability Terminology and Definitions

MIL–HDBK–470
Designing and Developing Maintainable Products and Systems, Volume I (Available at quicksearch.dla.mil/.)

OMB Circular A–76
Performance of Commercial Activities (Available at https://www.whitehouse.gov/omb/information-for-agencies/circulars/.)

Secretary of the Army and Chief of Staff Army Joint Memorandum, subject: Assessment of the Army Requirements Oversight Council, 17 June 2016

Technology Readiness Assessment Guidebook
(Available at https://www.cto.mil/wp-content/uploads/2023/07/tra-guide-jun2023.pdf.)

21 CFR
Food and Drugs

21 CFR 50
Protection of Human Subjects

21 CFR 54
Financial Disclosure by Clinical Investigators

21 CFR 56
Institutional Review Boards

21 CFR 312
Investigational New Drug Application

21 CFR 812
Investigational Device Exemptions

32 CFR 651
Environmental Analysis of Army Actions (AR 200–2)

10 USC
Armed Forces

10 USC Chapter 87
Defense Acquisition Workforce

10 USC 2350a
Cooperative research and development agreements: NATO organizations; allied and friendly foreign countries

10 USC 4171
Operational test and evaluation of defense acquisition programs

10 USC 4172
Major systems and munitions programs: survivability testing and lethality testing required before full-scale production

10 USC 4175
Use of test and evaluation installations by commercial entities

10 USC 4231
Major systems: determination of quantity for low-rate initial production

10 USC 4892
Availability of samples, drawings, information, equipment, materials, and certain services

Section III

Prescribed Forms

This section contains no entries.

Section IV

Referenced Forms

Except where otherwise indicated below, the following DA Forms are available on the Army Publishing Directorate website (https://armypubs.army.mil).

DA Form 11–2
Internal Control Evaluation Certification

DA Form 2028
Recommended Changes to Publications and Blank Forms

DA Form 7492
Test Incident Report

Appendix B

Key Functional Area Roles and Duties for Test and Evaluation

B–1. Capability developer

The CAPDEV will—

a. Formulate, integrate, and document DOTMLPF–P warfighting requirements. Develop and synchronize resource informed, COIC, TSPs (that is, doctrinal, organizational, training, and threat), and OTRS for proponent systems, and provide these products in a timely manner to support training and test planning.

b. Serve as the user's representative during the JCIDS, urgent and emergent operational needs, and T&E processes. Integrate and coordinate their capability development efforts including supporting analyses and experiments.

c. Determine, in coordination with the MATDEV, testers, system evaluator, and other TSARC members (such as HQDA), the need, schedule, and resources for test, experimentation, and M&S to support development and verification of system DOTMLPF–P products (see AR 5–11 and 70–1).

d. Use T&E data to refine system operational requirements and organizational design, aid in formulation of a position for decision events, and analyze, determine, and implement necessary action to correct operational deficiencies and organizational shortfalls based on TIRs and final T&E reports.

e. Serve as a core T&E WIPT member.

B–2. Program executive officer

The PEO explicitly endorses any test infrastructure investment in contractor test facilities/assets and monitors the TEMP approval staffing process so as to assist in the resolution of issues that may prohibit timely TEMP approval.

B–3. Materiel developer

The MATDEV is a PM or other responsible person that works for the development and acquisition command or agency for the system under development or being acquired. The PM may be the program, project, or product manager. The MATDEV responsibilities are listed below. This list represents a compilation of the key T&E duties that are performed by the MATDEV. The MATDEV should select from this list of duties to design, plan, program, coordinate, and execute a viable T&E program. The MATDEV will—

a. For MDAP and MAIS programs, designate a chief developmental tester responsible for coordinating the planning, management, and oversight of all DT&E activities; maintaining insight into system contractor activities; overseeing the T&E activities of other participating government activities; and helping the PM make technically informed, objective judgments about system contractor and government DT&E planning and results.

b. For MDAP programs, designate a government test agency to serve as the Lead DT&E organization responsible for providing technical expertise on DT&E issues to the chief developmental tester; conducting DT&E activities as directed by the chief developmental tester or designee; supporting certification and accreditation activities, when feasible; assisting the chief developmental tester in providing oversight with system contractors; and assisting the chief developmental tester in reaching technically informed, objective judgments about contractor and government T&E planning and results.

c. Provide T&E support to design, plan, execute, assess, and report developmental T&E programs, or portions of developmental T&E programs, in support of systems managed.

d. Ensure effective and timely system integration during the life cycle of the system to allow for T&E of the total system to include SoS.

e. Provide adequate and efficient design reviews, audits, and quality assurance in support of the T&E program for the system being acquired.

f. Provide VV&A activities during software development.

g. Starting at Milestone A, develop STARs in coordination with the threat community (see DoDI 5000.02 and AR 381–11).

h. Develop and provide threat TSP as required for DTs of Army materiel systems (see AR 381–11).

i. At program initiation establish a systems safety program in coordination with the U.S. Army Combat Readiness/Safety Center, the ATEC, the U.S. Army Public Health Command, and the life cycle management command materiel release office.

j. Develop and provide product support packages; spare and repair parts; technical literature; training packages to include, as required, NET TSPs and coordination of instructor and key personnel training; special tools and test measurement and diagnostic equipment; and unique software (see AR 700–127).

k. Provide test support documentation to the test organizations, including all data on certifications, as requested.

l. Obtain HHAs for systems acquisition programs from the U.S. Army Center for Health Promotion and Preventive Medicine in accordance with AR 40–10.

m. In coordination with the test organization, prepare appropriate NEPA environmental documentation prior to conducting a test. Appropriate documentation includes, but is not limited to, record of environmental considerations, environmental assessments, and environmental impact statements in accordance with AR 200–1 and 32 CFR 651. The test organization is responsible for determining what level of NEPA documentation is required and the completion thereof. The test organization is responsible for coordinating the NEPA documentation with the appropriate installation environmental office, for ensuring adequate NEPA documentation is available to the test decision maker prior to test, and for ensuring that all mitigation measures are funded and carried out as needed. Final documentation and records will be maintained by the MATDEV with a copy provided to the test organization at the location where the test was conducted. Appropriate coordination through the review chain is required by the approving official at the test location prior to the test start (see 32 CFR 651).

n. Participate as a member of in-process review, the integrated capabilities development team (ICDT), and other WGs, as required.

o. Establish and, through the chief developmental tester, chair the T&E WIPT in preparing, coordinating, distributing, maintaining, and implementing the approved TEMP. As a core member, ensures that the T&E WIPT develops the T&E strategy in order to coordinate and solve routine problems. Substantive issues that cannot be resolved by the T&E WIPT will be elevated through the chains of command of the participating T&E WIPT members for resolution. If resolution is not achieved, the issues will then be elevated to the Army T&E Executive for final adjudication, in coordination with the senior acquisition executive and operational user.

p. Provide the testers and system evaluators the opportunity to participate in preparing the testing portion of the RFP to ensure that T&E requirements are accurately reflected in contractual documents. Contracting actions will address the delivery of system contractor test data with the goal of ensuring the pedigree of the data, reducing T&E costs, increasing T&E efficiencies, and reducing program acquisition cycle times. Changes occurring during the system contract negotiations that affect testing will be communicated to the T&E WIPT. The approved TEMP will be updated to reflect those changes, when warranted.

q. When appropriate, PMs will ensure appropriate threat cyberspace operations testing in the operational environment is documented in the approved TEMP. The TEMP will document the CEMA testing strategy and resources and will include, as much as possible, activities to test and evaluate a system in a mission environment with a representative cyber-threat capability (additional guidance is included in the Defense Acquisition Guidebook).

r. Conduct and chair developmental test readiness reviews and LD readiness reviews, as well as participate in OTRRs to certify that the system (that is, materiel, software, and logistics support) is ready for OTs.

(1) When a separate PQT for materiel systems or SQT is conducted, a test readiness statement will be prepared, usually as part of the minutes of the test readiness review meeting.

(2) For an IOT, a formal certification (via an OTRS) will be provided in support of the OTRR.

(3) If the PQT and IOT are combined or integrated, formal certifications will be provided.

(4) Upon request from the tester, a formal certification is provided stating that the system, including brassboards in the development stage, is ready for use in any other OT or experiment.

s. Develop and provide the safety assessment report to the Army tester and ensure a safety release is provided by the appropriate command prior to commencement of investigations, studies, demonstrations, experiments, testing, and training involving Soldiers.

t. Ensure, in coordination with the T&E WIPT, that T&E of all systems is planned and conducted to sufficiently stress the system in representative environments, including testing in natural environments. Use of a simulation, including environmental chambers in lieu of, or to eliminate one or more environments from testing, will be formally justified and include supporting risk analysis.

u. Coordinate all testing, to include system contractor testing, with the ATEC to maximize the value of the Army's capital investment in test facilities. The ATEC will use data for system assessments and system evaluations, including the safety confirmation that is verified and validated in accordance with approved TOPs. For system contractor testing, the ATEC and other test organizations will identify technical data needs and rights, review test design plans, witness tests, and assess all technical data for system assessment and/or system evaluation purposes. T&E organizations are authorized and responsible for providing cost estimates to PEOs and/or PMs for performing activities to assess technical data. This coordination begins before program initiation and facilitates the generation of the testing requirements, as well as determines the extent and nature of system contractor services, if required. Programs will use government T&E capabilities unless an exception can be justified as cost-effective to the government. PMs will conduct a cost-benefit analysis for exceptions to this policy and obtain approval through the TEMP-approval process before acquiring or using non-government, program unique test facilities or resources. If a MRTFB activity cannot conduct a required

DT or if a cost-benefit cannot be derived by the use of a MRTFB activity, the PM will request authority to use system contractor support from his PEO and the CG, ATEC. If an agreement cannot be reached, the PEO and the CG, ATEC will seek resolution from the AAE and Army T&E Executive. When contractor support is used, Limited Rights technical data and Restricted Rights computer software may only be accessed by government employees and covered government support contractors. The decision and rationale to use contractor support must be documented in the approved TEMP. Assessment of cost-benefit must be based upon a documented analysis that includes range capability, availability, cost, and the value that major DoD ranges and ranges in the production industrial base provide to the Army. These provisions do not exempt the PM from applicable cost study and reporting requirements as necessitated by statute or regulation, including those set forth in Office of Management and Budget (OMB) Circular A–76, where applicable.

v. Determine whether the program satisfies the requirements (see para 4–3) for a LFT&E program (see 10 USC 2366).

w. Provide test items (system prototypes or system simulators as applicable) with required nonstandard logistics support for FDT/Es, DTs, and OTs, and provide prototypes and system simulators for warfighting and other experiments supporting early system assessments and DOTMLPF–P concepts or products within available funding.

x. Sponsor or encourage contractors to incorporate users and operational considerations into early test programs.

y. Based on the extent of future modifications and system changes in form, fit, and function, determine (in coordination with the ATEC) the scope of required CE after system fielding.

z. Maintain knowledge of changes in threat capabilities that could impact system performance, vulnerabilities, and survivability; perform necessary systems analyses; and inform the CAPDEV, the ATEC, the ASA (ALT) and the DCS, G–8 of all significant concerns as soon as possible.

B–4. Developmental tester

The developmental tester or other responsible party (such as system contractor or support contractor) will plan and conduct DTs. DTs are conducted throughout the system life cycle. DTs may be performed in contractor facilities, laboratories, and/or in government test facilities. The developmental tester will be afforded an opportunity to review system contractor test plans, witness testing at a system contractor facility, and review system contractor TRs, to include all derived test data. The developmental tester will provide test results to the MATDEV and the system evaluator, and to decision authorities when requested. The developmental tester will serve as a principal member of the T&E WIPTs, LFT&E subgroups, and other WGs, as required.

B–5. Operational tester

The operational tester conducts OTs and develops/approves the OT TDP. OTs are conducted to provide data to determine a system's operational effectiveness, operational suitability, and survivability. Testers participate early in the development cycle and continue throughout the system life cycle. The operational tester will provide TRs to the system evaluator, MATDEV, CAPDEV, and the decision review body that advises the MDA. The operational tester will serve as a principal member of the T&E WIPTs and other WGs, as required and chairs the OTRRs, as appropriate.

B–6. System evaluator

The system evaluator is organizationally separate from the MATDEV and CAPDEV, and is thus characterized as independent. The purpose of this independence is to ensure that the decision authority is provided unbiased, completely objective advice and perspective about the status of the development of a system. In this capacity, the system evaluator must ensure the credibility of all data sources in support of the system assessment and system evaluation processes. The system evaluator will—

a. Assess system operational effectiveness, operational suitability, and survivability (or the progress towards achieving these) during each phase in the life cycle. This is done by assisting in the engineering design and development and by determining the degree to which the CTPs, COIC, and other system requirements have been achieved. The system evaluator advises whether requirements are measurable and testable.

b. Plan, conduct, and report the system evaluation or system assessment. The system evaluator will participate in ICDTs, T&E WIPTs, system design reviews, and other WGs/IPTs, as required, while ensuring participation of the testers, when needed.

c. Serve as a core member of the T&E WIPT.

d. Optimize the use of data obtained from M&S and testbeds, as well as prototypes. The system evaluator may monitor contractor system tests and other non-TEMP data sources in order to validate data prior to use in system assessments and/or system evaluations. The system evaluator will review contractor test plans in order to leverage contractor developmental testing for system assessment, system evaluation, and safety verification. The system

evaluator will provide assessment reports (EOA and OA reports) and the SER to all interested members of the acquisition team and to milestone decision review bodies. The system evaluator will continually assess all assigned systems throughout their life cycle.

e. ATEC shall require lead system evaluators to obtain, at a minimum, Defense Acquisition Workforce Improvement Act T&E Level 2 certification (no later than 2 years from assignment) and shall establish prerequisites for lead system evaluators, including training requirements and authorities to effectively plan, lead, and execute T&E activities.

B–7. Logistician

The logistician is a principal member of the T&E WIPT, conducts logistic evaluation of systems being acquired, and ensures that logistics is adequately addressed in the TEMP, test design plans, and DTPs. The logistician participates in logistic assessment reviews and other WGs, as required.

B–8. Training developer

In support of T&E, the training developer:

a. Develops the training strategy, requirements, and package for individual, collective and unit training.

b. Conducts or oversees training for OTs.

c. Certifies that the trained Soldier players are ready for OTs.

d. Assists the CAPDEV, DCS, G–3/5/7 (Director, G–37/TR), the Army T&E Executive, and PEO for Simulation, Training, and Instrumentation in identifying opportunities to integrate testing and training support technologies to increase overall cost effectiveness without negatively impacting mission requirements. The responsible MATDEV and proponent CAPDEV will plan T&E for system and non-system TADSS as deemed appropriate. Planning for TADSS in DTs and/or OTs will be coordinated early in the RDT&E process to ensure efficient use of resources required to yield the data necessary to satisfy common needs of the proponent, independent system evaluators, and logisticians.

Appendix C

Internal Control Evaluation Process for Test and Evaluation of Defense Acquisition Programs at Milestone Decision Reviews

C–1. Function

The function covered by this evaluation is the T&E of all acquisition program types (that is, MDAPs (ACAT I), MAIS (ACAT IA), major systems (ACATs II), and non-major systems (ACAT III)).

C–2. Key internal controls

The key internal control for this function is the system's TEMP that is an acquisition milestone document for which the requirements are specified in DoDI 5000.02.

C–3. Internal control evaluation process

The key internal control must be evaluated using the milestone decision review process. Internal control evaluations should be included in the PEO, Direct Reporting PM, or PM's 5-year Internal Control Plan. The internal control must be certified on DA Form 11–2 (Internal Control Evaluation Certification) (see AR 11–2). Because internal control evaluations are conducted as part of milestone decision reviews, they will follow the schedule established by each program and not the uniform fiscal year schedule used normally in internal control plans. The IOT&E provisions in the Acquisition Decision Memorandum will serve as the documentation for the evaluation. Each approved system TEMP required by the MDA for each milestone decision review must be retained on file in the program office for the life of the program.

Glossary

Section I

Abbreviations

AAE
Army Acquisition Executive

ACAT
acquisition category

ACOM
Army command

ACSIM
Assistant Chief of Staff for Installation Management

ADP
Army doctrine publication

ADSS
ATEC Decision Support System

AEC
U.S. Army Evaluation Center

AHRPO
Army Human Research Protections Office

AIC
Army interoperability certification

AMC
U.S. Army Materiel Command

AMSAA
U.S. Army Materiel Systems Analysis Activity

APA
Army procurement appropriation

AR
Army regulation

ARCIC
U.S. Army Capabilities Integration Center

ARCYBER
U.S. Army Cyber Command

ARFORGEN
Army Force Generation

ARL
U.S. Army Research Laboratory

ARNG
Army National Guard

AROC
Army Requirements Oversight Council

ASA (ALT)
Assistant Secretary of the Army (Acquisition, Logistics and Technology)

ASARC
Army Systems Acquisition Review Council

ASCC
Army service component command

ATD
advanced technology demonstration

ATEC
U.S. Army Test and Evaluation Command

ATIRS
Army Test Incident and Reporting System

BOD
Board of Directors

BOIP
basis of issue plan

C&L
capabilities and limitations

C4
command, control, communications, and computers

CAPDEV
capability developer

CBDP
chemical and biological defense program

CBRN
chemical, biological, radiological, and nuclear

CDD
capability development document

CE
continuous evaluation

CECOM
U.S. Army Communications and Electronics Command

CEMA
cyber electromagnetic activities

CFR
code of federal regulation

CG
commanding general

CIO/G–6
Chief Information Officer/G–6

CJCSI
Chairman of the Joint Chiefs of Staff Instruction

CND
computer network defense

CoC
Council of Colonels

COE
U.S. Army Chief of Engineers

COI
critical operational issue

COIC
critical operational issues and criteria

CONOPS
concept of operations

COTS
commercial off-the-shelf

CPD
capability production document

CT
customer test

CTEIP
Central Test and Evaluation Investment Program

CTP
critical technical parameter

D&O
doctrine and organizational

DA
Department of the Army

DA Pam
Department of the Army pamphlet

DAE
Defense Acquisition Executive

DAS
Director of Army Safety

DASD (DT&E)
Deputy Assistant Secretary of Defense for Developmental Test and Evaluation

DBS
defense business system

DCR
DOTmLPF-P change recommendation

DCS
Deputy Chief of Staff

DFAS–IN
Defense Finance and Accounting Service Indianapolis Center

DICR
Army DOTmLPF-P integrated capabilities recommendation

DoD
Department of Defense

DoDD
Department of Defense directive

DoDI
Department of Defense instruction

DOT&E
Director, Operational Test and Evaluation

DOTmLPF–P
doctrine, organization, training, leader development and education, personnel, facilities, and policy (when used with lower case ‘m’ excludes new materiel development)

DOTMLPF–P
doctrine, organization, training, materiel, leader development and education, personnel, facilities, and policy

DRU
direct reporting unit

DT
developmental test

DT&E
developmental test and evaluation

DTP
detailed test plan

DUSA
Deputy Under Secretary of the Army

DUSA–TE
Deputy Under Secretary of the Army for Test and Evaluation

EDT
engineering development test

EOA
early operational assessment

ESOH
environment, safety, and occupational health

EUT
early user test

FAR
federal acquisition regulation

FAT
first article test

FCA
functional configuration audit

FD
full deployment

FD/SC
failure definition and scoring criteria

FDA
Food and Drug Administration

FDT/E
force development test or experimentation

FMECA
failure mode, effects, and criticality analysis

FMR
financial management regulation

FORSCOM
U.S. Army Forces Command

FOT
follow-on operational test

FRP
full-rate production

FTR
final test report

FUSL
full-up system level

FYDP
Future Years Defense Program

FYTP
Five-Year Test Program

GO
general officer

GS
general schedule

HHA
health hazard assessment

HQDA
Headquarters, Department of the Army

HSI
human systems integration

IA
information assurance

ICD
initial capabilities document

ICDT
integrated capabilities development team

IDE
investigational device exception

IMCOM
U.S. Army Installation Management Command

IND
investigational new drug

INSCOM
U.S. Army Intelligence and Security Command

IOT
initial operational test

IOT&E
initial operational test and evaluation

IPPD
integrated product and process development

IPS
integrated product support

IPT
integrated product/process team

IRB
Investment Review Board

IT
information technology

ITTS
instrumentation, targets, and threat simulators

JCIDS
Joint Capabilities Integration and Development System

JCTD
Joint Capability Technology Demonstration

JT&E
Joint test and evaluation

KPP
key performance parameter

KSA
key system attribute

LAT
lot acceptance test

LD
logistics demonstration

LF
live fire

LFT
live fire test

LFT&E
live fire test and evaluation

LRIP
low-rate initial production

LUT
limited user test

M&S
modeling and simulation

MAIS
major automated information system

MATDEV
materiel developer

MDA
milestone decision authority

MDAP
major defense acquisition program

MDD
materiel development decision

MEDCOM
U.S. Army Medical Command

MIL–HBK
military handbook

MOA
memorandum of agreement

MOE
measure of effectiveness

MOP
measure of performance

MOT&E
multi-Service operational test and evaluation

MOU
memorandum of understanding

MRTFB
major range and test facility base

MSDDC
Military Surface Deployment and Distribution Command

NATO
North Atlantic Treaty Organization

NBC
nuclear, biological, and chemical

NDI
nondevelopmental item

NEPA
National Environmental Policy Act

NET
new equipment training

NGB
National Guard Bureau

OA
operational assessment

OCAR
Office of the Chief Army Reserve

OIPT
overarching integrated product team

OMA
operation and maintenance, Army

OMB
Office of Management and Budget

OMS/MP
operational mode summary/mission profile

OPA
other procurement, Army

OSD
Office of the Secretary of Defense

OT
operational test

OT&E
operational test and evaluation

OTA
operational test agency

OTRR
operational test readiness review

OTRS
operational test readiness statement

OV
operational view

PCA
physical configuration audit

PDRR
protect, detect, react, and restore

PDSS
post-deployment software support

PEO
program executive officer

PM
program/project/product manager

PM ITTS
project manager for instrumentation, targets and threat simulators

POM
program objective memorandum

PPE
personnel protection equipment

PPT
production prove-out test

PQT
production qualification test

PVT
production verification test

RAM
reliability, availability, and maintainability

RDECOM
U.S. Army Research, Development, and Engineering Command

RDT&E
research, development, test, and evaluation

RFP
request for proposal

SDT
software development test

SEP
system evaluation plan

SER
system evaluation report

SLAD
U.S. Army Research Laboratory Survivability and Lethality Analysis Directorate

SLV
survivability, lethality, and vulnerability

SO
special operations

SoS
system-of-systems

SQT
software qualification test

SST
supplemental site test

STAR
system threat assessment report

SV–1
system view architecture

SvcV–1
system service view architecture

T&E
test and evaluation

TADSS
training aids, devices, simulators, and simulations

TAS
technical assurance standard

TBD
to be determined

TDP
test design plan/technical data package

TEMAC
Test and Evaluation Managers Committee

TEMP
test and evaluation master plan

TFT
technical feasibility test

TIR
test incident report

TOP
test operations procedure

TR
test report

TRADOC
U.S. Army Training and Doctrine Command

TRAG
test resource advisory group

TRL
technology readiness level

TRP
test resource plan

TSARC
Test Schedule and Review Committee

TSG
The Surgeon General

TSP
test support package

TTPs
tactics, techniques, and procedures

UAT
user acceptance test

USACE
U.S. Army Corps of Engineers

USAPAC
U.S. Army Pacific

USASMDC/ARSTRAT
U.S. Army Space and Missile Defense Command/Army Forces Strategic Command

USASOC
U.S. Army Special Operations Command

USC
United States Code

USD (AT&L)
Under Secretary of Defense for Acquisition, Technology, and Logistics

VV&A
verification, validation, and accreditation

WG
working group

WIPT
working-level integrated product team

Section II

Terms

Accelerated acquisition program
A program directed at accelerating procurement of systems identified through experiments and tests as compelling successes that satisfy an urgent need. Accelerated acquisition programs are implemented within the existing Army structure and are compatible with and support FAR, DoD, and Army acquisition policy (see DoD 5000 series and AR 70 series). Accelerated acquisition programs apply when schedule considerations dominate over cost and technical risk considerations. It compresses or eliminates phases of the acquisition process and accepts the potential for inefficiencies in order to achieve a deployed capability on a compressed schedule. This type of structure is used when technological surprise by a potential adversary necessitates a higher-risk acquisition program (see DoDI 5000.02).

Accreditation
The official certification that a test capability (such as instrumentation, simulator, stimulator, model, simulation, or federation of models and simulations and associated data) is acceptable for use for a specific purpose.

Acquisition category
All defense acquisition programs are designated by an ACAT (that is, ACAT I, ACAT II, and ACAT III) and type (such as, MDAP, MAIS, or Major System). ACAT I programs are those programs that are MDAPs or that are designated ACAT I by the MDA as a result of the MDA's special interest. ACAT ID programs have the Defense Acquisition Board as the milestone review forum and the Defense Acquisition Executive (DAE) (or as delegated) as the acquisition MDA. ACAT IC programs have the ASARC as the milestone review forum and the AAE as the acquisition MDA. Per AR 70–1, the AAE cannot delegate ACAT IC MDA. Being designated as an ACAT IA, the program is classified

as a MAIS programs (that is, a MAIS which could be either a product or a service). ACAT IAM programs have the Defense Acquisition Board as the milestone review forum and the DAE (or as delegated) as the acquisition MDA. ACAT IAC programs have the ASARC as the milestone review forum and the AAE as the acquisition MDA. Per AR 70–1, the AAE cannot delegate ACAT IAC MDA. ACAT II programs do not meet ACAT designation criteria for ACAT I or ACAT IA programs. ACAT III programs do not meet the ACAT designation criteria for ACAT II programs.

Advanced technology demonstration
A demonstration of the military utility of a significant new technology and an assessment to clearly establish operational utility and system integrity. An ATD is used to expedite the transition of maturing technologies from the developers to the users. An ATD emphasizes technology assessment and integration rather than technology development with a goal to provide a prototype capability to the Soldier and to support an assessment of that capability. Soldiers evaluate the capabilities in military exercises and at a scale sufficient to fully assess military utility so as to allow the user and MATDEV to jointly experiment with the application of technologies and new operational concepts in a field environment prior to committing to formal acquisition (see AR 71–9).

Army procurement appropriation
APA is a general term which refers to several procurement accounts, such as AMMO (ammunition), WTCV (wheeled and tracked combat vehicle), ACFT (aircraft), MSLS (missiles), and OPA (other procurement, Army). The term procurement is intended to include activities related to the procurement, production, and modification of Army equipment assets. APAs are normally available for obligation for 3 fiscal years (see Army Management Structure, DFAS Manual 37–100 and https://www.asafm.army.mil/).

Battle laboratories
Organizations chartered by the CG, TRADOC/ARCIC with the mission to plan, conduct, and report warfighting experiments supporting the requirements determination process. Battle laboratories provide linkage with the science and technology and acquisition communities on JCTDs and ATDs and provide for participation in technology reviews.

Board of Directors for Test and Evaluation
The BOD is the lead agent for the oversight of the T&E infrastructure. The BOD has authority over the Services relating to their T&E infrastructure investment, infrastructure consolidation, standards, and policy relating thereto. The BOD ensures that modernization investments are made at test facilities and ranges that are best suited to support required testing without regard to Service ownership. The BOD also ensures that the Services develop streamlining, consolidation, and downsizing initiatives for the T&E Infrastructure. The BOD is composed of the three Service T&E Executives (Army T&E Executive, N–084, and AF/TE). The Assistant Commandant Marine Corps is an advisory member. The Joint Staff participates as a member for advocacy of subjects of their interest (for example, training). The BOD also establishes liaison and coordinates plans, as deemed necessary, with the Joint Chiefs of Staff, DoD agencies, OSD, and cognizant Unified and Specified Commands.

Breadboard configuration
An experimental device (or group of devices) used to determine feasibility and to develop technical data. It will normally be configured only for laboratory use to demonstrate the technical principles of immediate interest. It may not resemble the end-item and is not intended for use as the projected end-item.

Bundled tests
DT and/or OT that can be conducted simultaneously or sequentially with compatible or interoperable systems. Programs of record, rapid acquisition initiatives, technical demonstrations (for example, Joint Capabilities Technical Demonstrations and Advanced Concept Technical Demonstrations), and JT&E TSARC supported tests can be uncoupled if one system is not ready to participate in the bundled test at the agreed upon date.

Capabilities and limitations report
Includes all available valid, verifiable data and information gathered during ATEC, other Service, and industry testing and assessments. The C&L Report is intended to provide Soldiers and gaining Army unit essential information to assist in making an informed decision regarding equipping, employment, and potential future acquisition decisions. The format for the C&L Report makes it inviting and easy to read for Soldiers, who are able to look for information they need rather than reading it cover to cover. The level of detail provided in the C&L Report will vary depending on the amount of pre-existing information available on the system and the amount of time and resources available to conduct additional testing on the system.

Capability developer
The command or agency that formulates warfighting requirements for DOTMLPF–P solution sets. The acronym CAPDEV may be used generically to represent the user and user maintainer community role in the materiel acquisition process (a counterpart to the generic use of MATDEV). The CAPDEV analyzes, determines, prioritizes, and documents requirements for doctrine, organizations, training, leader development and education, materiel and materiel-centric DOTMLPF–P requirements, personnel, and facilities within the context of the force development process. The CAPDEV is also responsible for representing the end user during the full development and life cycle process and ensures all enabling capabilities are known, affordable, budgeted, and aligned for synchronous fielding and support.

Closed network
A network, or its components, that does not touch the DoD Information Network or the Army's portion of the network.

Combined developmental test and operational test
A single test that produces data to answer developmental and OT objectives. A combined DT/OT is usually conducted as a series of distinct DT and OT phases at a single location using the same test items. In the case where a single phase can be used to simultaneously meet developmental and OT objectives, this testing will be referred to as integrated DT/OT. Combined DT/OT and integrated DT/OT are encouraged to achieve time, cost, and resource savings. However, they should not compromise DT and OT objectives.

Command, control, communications, and computer system
Integrated systems of doctrine, procedures, organizational structures, personnel, equipment, facilities, and communications designed to support a commander's exercise of command and control across the range of military operations.

Computer network defense
Actions taken to protect, monitor, analyze, detect and respond to unauthorized activity within DoD information systems and computer networks (see CJCSI 6510.01).

Continuous evaluation
A process that provides a continuous flow of T&E information on system status and that is employed on all acquisition programs. It ensures responsible, timely, and effective assessments of the status of a system. CE can begin as early as the battlefield functional mission area analysis for materiel systems and as early as the Information Management Plan process for IT. It continues through a system's post-deployment activities.

Critical operational issues and criteria
Key operational concerns (issues) of the decision maker, with bottom line standards of performance (criteria) that, if satisfied, signify the system is operationally ready to proceed beyond the FRP/FD decision review. COIs must be relevant to the required capabilities and of key importance to the system being operationally effective, operationally suitable and survivable, and represent a significant risk if not satisfactorily resolved. A COI/COIC is normally phrased as a question that must be answered in the affirmative to properly evaluate operational effectiveness (for example, "Will the system detect the threat in a combat environment at adequate range to allow successful engagement?") and operational suitability (for example, "Will the system be safe to operate in a combat environment?"). COIC are not pass/fail absolutes but are showstoppers, such that a system falling short of the criteria should not proceed beyond the FRP/FD unless convincing evidence of its operational effectiveness, operational suitability, and survivability is provided to the decision makers/authorities. COIC are few in number and reflect total operational system concern and employ higher order measures.

Customer test
A test conducted by a test organization for a requesting agency external to the test organization. The requesting agency coordinates support requirements and provides funds and guidance for the test. It is not directly responsive to Army program objectives and is not scheduled or approved by the TSARC unless external operational sources are required for test support.

Cyber electromagnetic activities
Activities leveraged to seize, retain, and exploit an advantage over adversaries and enemies in both cyberspace and the electromagnetic spectrum, while simultaneously denying and degrading adversary and enemy use of the same and protecting the mission command system (see FM 3–12). CEMA T&E involves cyberspace operations (primarily defensive cyberspace operations), electronic warfare (primarily electronic protection), and spectrum management operations.

Cybersecurity
Prevention of damage to, protection of, and restoration of computers, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and nonrepudiation (see DoDI 8500.01).

Cyberspace attack
Actions that create various direct denial effects in cyberspace (degradation, disruption, or destruction) and manipulation that leads to denial that is hidden or manifests in the physical domain (see JP 3–12).

Cyberspace operations
The employment of cyberspace capabilities where the primary purpose is to achieve objectives in or through cyberspace (see JP 3–0).

Data dictionary
Collection of names, definitions, and attributes about data elements captured as part of system testing; used to describe the meanings and purposes of data elements within the context of system testing and provides guidance on interpretation and accepted meanings; defines the scope and characteristics, rules for usage, and application of the data elements.

Data methods
Description of how data will be collected (for example, observation, interview, survey, focus group, instrumentation, and so forth), reduced, and analyzed.

Database structure
Describes how data elements (fields) are grouped into tables, fields used to uniquely identify data rows, field characteristics, data integrity rules, indices, and the relationships between tables.

Defense Business System
An information system, other than a national security system, operated by, for, or on behalf of the DoD, including financial systems, management information systems, financial data feeder systems, and the IT and cybersecurity infrastructure used to support business activities, such as contracting, pay and personnel management systems, some logistics systems, financial planning and budgeting, installations management, and human resource management. The Army Chief Management Officer makes the determination that an Army program is a DBS (see DoDI 5000.02).

Detailed test plan
A plan used to supplement the TDP with information required for day-to-day conduct of the test. It provides requirements for activities to be conducted to ensure proper execution of the test. The DTP is a document compiled by the activity responsible for test execution.

Developmental test
Any engineering-type test used to verify the status of technical progress, verify that design risks are minimized, substantiate achievement of contract technical performance, and certify readiness for IOT. DTs generally require instrumentation and measurements and are accomplished by engineers, technicians, or Soldier-user test personnel.

Developmental test readiness review
A review conducted by the PM to determine if the materiel system is ready for the PQT, or that the IT is ready for the SQT.

Developmental test readiness statement
A written statement prepared by the chairman of the dt readiness review as part of the minutes. The statement documents that the materiel system is ready for the PQT, or that the IT is ready for the SQT.

Developmental tester
The command or agency that plans, conducts, and reports the results of Army DTs. System contractors may perform technical testing on behalf of the command or agency.

Distributed testing
A test linking multiple, geographically-separated live, virtual, and/or constructive test sites and systems together in a common scenario and operationally realistic environment to assess the integration and interoperability of systems.

Doctrine and organization test support package
A set of documentation prepared or revised by the CAPDEV (or force modernization proponent) for each OT supporting a milestone decision. Major components of the D&O TSP are means of employment, organization, logistics concepts, OMS/MP, and test setting.

Early operational assessment report
An EOA report documents the analyses, conducted in accordance with an approved TDP, of a system's progress in identifying operational design constraints, developing system capabilities, and mitigating program risks. For systems that enter the defense acquisition system at Milestone B, the lead OTA will, as appropriate, present EOA results. The EOA report will be completed after program initiation and prior to the Critical Design Review.

Electromagnetic environmental effects
Describes the impact of the electromagnetic environment on the operational capability of military forces, equipment, systems, and platforms. These effects encompass all electromagnetic disciplines, including electromagnetic compatibility; electromagnetic interference; electromagnetic vulnerability; electromagnetic pulse; electronic counter-countermeasures; hazards of electromagnetic radiation to personnel, ordnance, and volatile materials; and natural phenomena effects of lightning, electrostatic discharge, and p-static.

Engineering development test
A DT conducted during system development and demonstration to provide data on performance, safety, NBC survivability, the achievement of a system's CTPs, the refinement and ruggedization of hardware configurations, and the determination of technical risks. An EDT is performed on components, subsystems, materiel improvement, commercial items and NDI, hardware-software integration, and related software. EDT includes the testing of compatibility and interoperability with existing or planned equipment and systems and the system effects caused by natural and induced environmental conditions during the development phases of the materiel acquisition process.

Environment, safety, and occupational health
ESOH refers to all of the individual, but interrelated, disciplines that encompass the processes and approaches for addressing laws, regulations, executive orders, policies, and hazards associated with environmental compliance, environmental impacts, system safety, occupational safety and health, hazardous materials management, and pollution prevention. The system safety methodology is used across the ESOH disciplines to identify hazards and mitigate risks through the systems engineering process.

Evaluation
Evaluation is a process whereby data are logically assembled, analyzed, and compared to expected performance to aid in decision making. By analysis of qualitative and quantitative data and information obtained from design reviews, hardware inspections, M&S, DT, and OT, the independent system evaluators determine if a system satisfies the approved requirements and is operationally effective, operationally suitable, and survivable. This system evaluation is independent of the MATDEV and CAPDEV evaluations to ensure objectivity for the decision maker. The system evaluation will assess data from all credible sources.

Experimentation
The exploration of innovative methods of operating (especially to assess feasibility, evaluate utility, or determine limits) in order to reduce risk in the current force (today's operations) and the future force (developments). Experimentation identifies and verifies acceptable solutions for required changes in DOTMLPF–P to achieve significant advances in current and future capabilities. Experiments aid in validating the feasibility of future requirements' determination efforts.

Final test report
A developmental TR prepared for all evaluated tests. If an interim data report has been developed, it will be used as the basis for the FTR. The FTR may be tailored to address the needs of each individual test.

First article test
A test conducted for quality assurance purposes to qualify a new manufacturer or procurements from a previous source out of production for an extended period (usually 2 years) and to produce assemblies, components, or repair parts conforming to requirements of the technical data package. FATs may be conducted at government facilities or at contractor facilities when observed by the government.

Five-Year Test Program
A compendium of TSARC recommended and DCS, G–3/5/7 approved TRPs in the following five years. The FYTP identifies validated requirements to support the Army's test programs. It is developed within the existing budget and program constraints in accordance with Army priorities. It is a tasking document for the current and budget years and provides test planning guidelines for the subsequent years.

Follow–on operational test
A test conducted during and after the production and deployment phase to verify correction of deficiencies observed in earlier tests in order to refine information obtained during IOT, to provide data to evaluate changes, or to provide data to reevaluate the system to ensure that it continues to meet operational needs.

Force development test or experimentation
A test or experimentation program supporting force development processes by examining the effectiveness of existing or proposed concepts or products of DOTmLPF-P.

Force modernization proponent
The HQDA principal official or the commander, commandant, director, or chief of a center, school, institution, or agency with primary duties and responsibilities relative to DOTMLPF–P and related requirements for a particular function (see AR 5–22).

Foreign comparative testing
The T&E of NATO and non-NATO Allies' defense equipment to determine whether such equipment meets valid existing DoD needs. The primary objective of foreign comparative testing is to leverage NDI of allied and friendly nations to satisfy DoD requirements or correct mission area shortcomings (see 10 USC 2350a).

Full–rate production
The second effort part of the production and deployment phase as defined and established by DoDI 5000.02 after LRIP and following a successful FRP decision review. The system is produced at rate production and deployed to the field. This phase overlaps the operations and support phase since fielded systems are operated and supported (sustained) while FRP is ongoing (see DAU Glossary of Defense Acquisition Acronyms and Terms).

Functional sponsor
The HQDA agency responsible for the subject area in which the resources are being used (for example, DCS, G–1 for personnel; DCS, G–4 for logistics; or DCS, G–2 for intelligence).

Human systems integration
A comprehensive management and technical strategy, initiated early in the acquisition process, to ensure that human performance, the burden the design imposes on manpower, personnel, and training, and safety and health aspects are considered throughout the system design and development processes. Human factors engineering requirements are also established to develop effective human-machine interfaces, and minimize or eliminate system characteristics that require extensive cognitive, physical, or sensory skills; to require excessive training or workload for intensive tasks; or to result in frequent or critical errors or safety and/or health hazards. The C&L of the operator, maintainer, repairer, trainer, and other support personnel will be identified prior to program initiation (usually MDD and/or Milestone A) and refined during the development process. Army HSI and DoDI 5000.02 incorporate Soldier survivability considerations into that process (see AR 602–2).

Information technology system
Any equipment or interconnected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. Also includes computers, ancillary equipment, software, firmware, and similar procedures, services (including support services), and related resources.

Initial operational test
The dedicated field test, under realistic combat conditions, of production or production representative items of weapons, equipment, or munitions to determine operational effectiveness, operational suitability, and survivability for use by representative military or civilian users.

Integrated capabilities development team
Consists of key stakeholders and subject matter experts from multiple disciplines chartered by TRADOC's Director, ARCIC to initiate the JCIDS process through conduct of the capabilities-based assessment to identify capability gaps in a functional area, identify nonmateriel and/or materiel approaches to resolve or mitigate those gaps, and develop an ICD and/or a DCR or DICR, when directed.

Integrated developmental test and/or operational test
As a special case of a combined DT/OT, a single phased test that generates data to address developmental and operational objectives simultaneously under operational conditions. The execution strategy for this type of test is based on the requirements of the program.

Integrated product and process development
A technique that integrates all acquisition activities in order to optimize system development, production, and deployment. Key to the success of the IPPD concept are the IPTs, which are composed of qualified and empowered representatives from all appropriate functional disciplines who work together to identify and resolve issues. As such, IPTs are the foundation for organizing for risk management.

Integrated product team
A team composed of representatives from all appropriate functional disciplines and levels of organization working together with a leader to build successful and balanced programs, identify and resolve issues, and make sound and timely decisions.

Integrated test
A single test intended to drive systems in a single capability portfolio to be tested and fielded together so as to ensure that systems can interoperate and work effectively together while consolidating tests to reduce the burden on operational forces.

Integrated testing process
The collaborative planning and collaborative execution of test phases and events to provide shared data in support of independent analysis, evaluation, and reporting by all stakeholders, particularly the developmental (both contractor and government) and OT&E communities. Integrated testing is not a test or separate test phase, nor is it a new type of test. The goal of integrated testing is to conduct a seamless test program that produces credible qualitative and quantitative data useful to all system evaluators, and to address developmental, sustainment, and operational issues. While integrated testing is a process intended to result in resource efficiencies (time, money, people, and assets) and an enhanced data set for separate evaluations it does not replace or eliminate the need for dedicated IOT.

Interim data report
A developmental TR developed as a tool to respond directly to the data requirement of the DTP. The interim data report is prepared for those tests in direct support of a system evaluation or system assessment when the test results are on a critical path to provide the data to the system evaluator to meet the requirements in support of a milestone decision.

Interoperability certification test
A test that applies to command, control, communications, computers, and IT systems that has interfaces or interoperability requirements with other systems. This test may consist of simple demonstrations with limited connectivity using message analysis or parsing software with limited interface connectivity, or extend to full-scale scenario-driven exercises with all interfaces connected.

Joint capability technology demonstration
A demonstration of the military utility of a significant new technology and an assessment to clearly establish operational utility and system integrity (see JCIDS Manual).

Key resources
Items necessary to generate data for evaluating the COIs and/or COIC, key requirements, and T&E measures. Key resources may include test articles; test sites and instrumentation; test support equipment; threat representation; test targets and expendables; operational force test support; modeling, simulations, and testbeds; joint OT environment; and special requirements.

Lethality
The ability of a munition (or laser, high power microwave, and so forth) to cause damage that will cause the loss or degradation in the ability of a target system to complete its designated missions. Lethality is often expressed in terms of the probability that a weapon will destroy or neutralize a target.

Limited user test
Any type of RDT&E-funded user test conducted that does not address all of the system's operational effectiveness, operational suitability, or survivability issues and is therefore limited in comparison to an IOT that must address all of a system's operational effectiveness, operational suitability, and survivability issues. Accordingly, LUTs only address a limited number of operational issues. The LUT may be conducted to provide a data source for system assessments in support of the LRIP decision (Milestone C) and for reviews conducted before IOT. The LUT may be conducted to verify solutions to problems discovered in IOT that must be verified prior to fielding when the solutions are of such importance that verification cannot be deferred to the FOT.

Logistic demonstration
A LD evaluates the achievement of maintainability goals, the adequacy and sustainability of tools, test equipment, selected test programs sets, built-in test equipment, and the associated support items of equipment, technical publications, maintenance instructions, troubleshooting procedures, and personnel skill requirements. Also evaluated are the selection and allocation of spare parts, tools, test equipment, and tasks to appropriate maintenance levels, and the adequacy of maintenance time standards.

Logistician
An Army staff element that conducts or oversees the logistic evaluation of systems being acquired and assures that logistics is adequately addressed in the approved TEMP and DTPs.

Low rate initial production
LRIP is the first effort of the production and deployment phase. The purpose of this effort is to establish an initial production base for the system, permit an orderly ramp-up sufficient to lead to a smooth transition to FRP, and to provide production representative articles for IOT, and FUSL LF testing. This effort concludes with a FRP Decision Review to authorize FRP and deployment. The minimum number of systems (other than ships and satellites) to provide production representative articles for IOT, to establish an initial production base and to permit an orderly increase in the production rate sufficient to lead to FRP upon successful completion of operational testing. For MDAPs, LRIP quantities in excess of 10 percent of the acquisition objective must be reported in the selected acquisition report. For ships and satellites, LRIP is the minimum quantity and rate that preserves mobilization (see AR 70–1).

Market research
A process for gathering data on product characteristics, suppliers' capabilities, and the business practices that surround them, and the analysis of that data to make acquisition decisions. Market research has two phases: market surveillance and market investigation.

Materiel developer
The research, development, and acquisition command, agency, or office assigned responsibility for the system under development or being acquired. This position can refer to the PEO, program or project manager, or others assigned to this function by the developing agency. The term may be used generically to refer to the research, development, and acquisition community in the materiel acquisition process (as a counterpart to the generic use of CAPDEV).

Measure of effectiveness
The data used to measure the military effect (mission accomplishment) that comes from the use of the system in its expected environment. That environment includes the system under test and all interrelated systems, that is, the planned or expected environment in terms of weapons, sensors, command and control, and platforms, as appropriate, needed to accomplish an end-to-end mission in combat (see DAU Glossary of Defense Acquisition Acronyms and Terms).

Measure of performance
System-particular performance parameters such as speed, payload, range, time-on-station, frequency, or other distinctly quantifiable performance features. Several MOPs may be related to achieving a particular measure of effectiveness (see DAU Glossary of Defense Acquisition Acronyms and Terms.)

Metrics
Measurement standards for defining system performance during testing (for example, test entrance/exit criteria, reliability point estimates, TRL, and so forth).

Milestone A
A risk reduction decision which approves an acquisition program to entry into the Technology Maturation and Risk Reduction Phase and release of final RFPs for Technology Maturation and Risk Reduction activities. Milestone A is an investment decision to pursue specific product or design concepts, and to commit the resources required to mature technology and/or reduce any risks that must be mitigated prior to decisions committing the resources needed for development leading to production and fielding.

Milestone B
The decision that authorizes an acquisition program to enter into the Engineering and Manufacturing Development Phase and for the Army to award contracts for Engineering and Manufacturing Development. Milestone B also commits the required investment resources to the program. And is normally the formal initiation of an acquisition program with the MDA's approval of the Acquisition Program Baseline.

Milestone C
The decision to enter the production and deployment phase following development and testing. Entrance into the production and deployment phase (or for Limited Deployment) depends in part on specific criteria defined at Milestone B and included in the Milestone B acquisition decision memorandum. The Milestone C production decision is normally LRIP or limited deployment.

Mission accomplishment
The most critical measure for all Army tactical missions and tasks is if the mission is accomplished. Mission accomplishment measures can be objective and subjective in their evaluation by commanders.

Model
A model is a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process.

Modeling and simulation
The development and use of live, virtual, and constructive models including simulators, stimulators, emulators, and prototypes to investigate, understand, or provide experiential stimulus to either (1) conceptual systems that do not exist or (2) real life systems which cannot accept experimentation or observation because of resource, range, security, or safety limitations. This investigation and understanding in a synthetic environment will support decisions in the domains of research, development, and acquisition and advanced concepts and requirements, or transfer necessary experiential effects in the training, exercises, and military operations domain.

Modification
A modification is a change to a system that is still in production consisting of an alteration, conversion, or modernization of an end item or component of investment equipment that changes or improves the original purpose or operational capacity in relation to effectiveness, efficiency, reliability, or safety of that item.

New equipment training test support package
A package first prepared by the MATDEV to support training development for new materiel and IT, including conduct of T&E of new equipment and software. Based on the NET program, the MATDEV prepares, as appropriate, a NET TSP. The NET TSP is provided to the training developers and testers. It is used to train player personnel for DT and to conduct training of instructor and key personnel who train player personnel for OT. The training developer uses the NET TSP to develop the training TSP.

Offensive cyberspace operations
Cyberspace operations intended to project power by the application of force in or through cyberspace (see JP 3–12).

Open network
A network, or its components, that touches the Global Information Grid or Army networks.

Operational assessment report
Addresses the progress toward achieving system requirements and resolution of issues. The scope of issues to be addressed by the OA report is flexible in that it may or may not cover all aspects of operational effectiveness, operational suitability, and survivability. An OA report may address technical aspects of a system. For example, it may provide a PM with an assessment of a system's exit criteria (some level of demonstrated performance) or an indication that a system is progressing satisfactorily. An OA report is not required for programs that enter the acquisition system at Milestone C (for example, contractor off-the-shelf and NDIs). For an acquisition program employing the incrementally deployed software intensive program model (see DoDI 5000.02), a risk-appropriate OA report is usually required in support of every limited deployment. The OA report is typically produced as input to nonmilestone decisions or inquiries and to support system evaluation.

Operational effectiveness
The measure of the overall ability of a system 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. Some examples of environment are natural, electronic, threat, and so forth for operational employment of the system considering organization, doctrine, tactics, survivability, vulnerability, and threat (including countermeasures, initial nuclear weapons effects, and NBC contamination threats).

Operational suitability
The degree to which a system can be satisfactorily placed in field use with consideration to reliability, availability, compatibility, transportability, interoperability, wartime usage rates, maintainability, safety, human factors, habitability, manpower supportability, logistics supportability, documentation, environmental effects and training requirements.

Operational test
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.

Operational test readiness review
A review conducted, as deemed necessary by the operational tester (unless the program is on DOT&E OT oversight) before each OT of a system. The purpose is to identify problems that may impact on starting or adequately executing the test and includes a review of DT&E results; an assessment of the system's progress against the KPPs, KSAs, and CTPs in the approved TEMP; an analysis of identified technical risks to verify that those risks have been retired or mitigated to the extent possible during DT&E and/or OT&E; a review of system certifications; and a review of the IOT&E entrance criteria specified in the approved TEMP.

Operational test readiness statement
A written statement prepared by the CAPDEV, MATDEV, training developer or trainer, and test unit commander before the start of OT for use during the OTRR. The OTRS addresses or certifies the readiness of the system for testing in each member's area of responsibility. OTRSs may also be required for some FDT/E and should be specified in the TRP.

Operational tester
A command or agency that plans, conducts, and reports the results of OT, such as ATEC, USASMDC/ARSTRAT, MEDCOM, INSCOM, or COE.

Operational view
An OV is a view of the military operational elements, tasks, activities and information flows that support mission accomplishment. OV products provide descriptions of the tasks and activities, operational elements, and information exchanges required to accomplish military missions. OVs specify operational nodes (for example, Division Main, Brigade Tactical Operation Center, and Staff Sections), information exchange, activities or tasks, and the phasing or ordering of the activities or tasks.

Other appropriation, Army
In addition to APAs and RDT&E budget activities, OPAs consists of OPA 1 (Tactical & Support Vehicles), OPA 2 (Communications & Electronics), and OPAs 3 & 4 (Other Support Equipment & Spares).

Overarching integrated product team
A DoD (or Army-led) team usually composed of the former Defense Acquisition Board Committee chairperson, the applicable PM and PEO, and component and OSD staff principals or their representatives. The OIPT is involved in the oversight and review of a particular ACAT ID program. The OIPT structures and tailors functionally oriented IPTs to support the MATDEV, as needed, and in the development of strategies for acquisition/contracts, cost estimates, evaluation of alternatives, logistics management, and similar management concerns. The OIPT meets immediately after learning that a program is intended to be initiated in order to determine: the extent of IPT support needed for the potential program, who should participate on the IPTs, the appropriate milestone for program initiation, and the documentation needed for the program initiation review. After submission of final documentation for a milestone review, the OIPT, together with the Component Acquisition Executive, will hold a formal meeting chaired by the OIPT leader. This meeting will determine if any issues remain that have not been resolved earlier in the process, in order to assess the MATDEVs recommendations for future milestone reviews and documentation, and to determine if the program is ready to go forward for a decision. Former Defense Acquisition Board and service-level committees are replaced by OIPTs.

Partnering
A commitment between government and industry to improve communications and avoid disputes. It constitutes a mutual commitment by the parties on how they will interact during the course of a contract, with the primary objective of facilitating improved contract performance through enhanced communications. It is accomplished through an informal process with the primary goal of providing American Soldiers with quality supplies and services, on time, and at a reasonable cost.

Penetration testing
Security testing in which system evaluators attempt to circumvent the security features of an information system based on the system evaluator's understanding of the system design and implementation. Its purpose is to confirm and

demonstrate through penetration testing, techniques, and procedures the degree of the information system's defensive postures, vulnerabilities, and procedures.

Pilot production item
An item produced from a limited production run on production tooling to demonstrate the capability to mass-produce the item.

Problem statement
A stand-alone regulatory document for DBSs. Functional sponsors analyze a perceived business problem, capability gap, or opportunity and document the results in a Problem Statement which includes measurable business outcomes, a rough order of magnitude cost estimate and projected/anticipated financial return measures such as net present value, payback or return on investment. The DBS Problem Statement must be reviewed by the Investment Review Board (IRB) and approved by the IRB chair. Analysis supporting the DBS Problem Statement will be forwarded to the IRB and the Joint Staff for review. The DBS Problem Statement will be refined over time to inform post-MDD decision making. The final DBS Problem Statement will be reviewed by the IRB and approved by the IRB chair prior to the Development RFP Release Decision Point. Approved DBS Problem Statements will be submitted to the MDA 30 days prior to the MDD and any subsequent decision point where they are required. The Joint Requirements Oversight Council, on advice of the J–8 and the Functional Capabilities Board, will have authority to review DBS problem statements to determine if Joint Requirements Oversight Council interest exists.

Product support package
The set of support elements planned for materiel in the operational (deployed) environment provided before and tested and evaluated during technical T&E and user T&E to determine the adequacy of the planned support capability. The product support package is a composite of the support resources that will be evaluated during an LD and tested and validated during developmental T&E. The product support package includes items such as spare and repair parts, technical manuals/interactive electronic technical manuals prepared in accordance with current military and approved commercial standards, training package, special tools, test measurement and diagnostic equipment, and unique software (see AR 700–127).

Production
The process of converting raw materials by fabrication into required materiel. It includes the functions of production-scheduling, inspection, quality control, and related processes. A production item is an end item under initial or FRP (see DAU Glossary of Defense Acquisition Acronyms and Terms).

Production decision
A commitment to acquire a materiel system as either a LRIP or FRP.

Production prove–out test
A DT conducted before production testing with prototype hardware for the selected design alternative. The PPT provides data on safety, NBC survivability, achievability of CTPs, refinement and ruggedization of hardware and software configurations, and determination of technical risks. After type classification, production prove-out testing may also be conducted to provide data that could not be obtained before type classification, such as survivability or environmental data.

Production qualification test
A system-level DT conducted using LRIP assets, when available, prior to the FRP decision review that ensures design integrity over the specified operational and environmental range. This test usually uses prototype or preproduction hardware fabricated to the proposed production design specifications and drawings. Such tests include contractual reliability and maintainability demonstration tests required before production release.

Production verification test
A system-level DT conducted post-FRP to verify that the production item meets CTPs and contract specifications, to determine the adequacy and timeliness of any corrective actions indicated by previous tests, and to validate the manufacturer's facilities, procedures, and processes. This test may take the form of a FAT if such testing is required in the TDP. A FAT is required for quality assurance purposes to qualify a new manufacturer or procurements from a previous source out of production for an extended period and to produce assemblies, components, or repair parts satisfying the requirements of the TDP.

Program executive officer
The GO or senior executive who provides the overall management of the T&E activities of assigned systems.

Program of record
Program as recorded in the current Future Years Defense Program (FYDP) or as updated from the last FYDP by approved program documentation (for example, Acquisition Program Baseline, acquisition strategy/problem statement, or Selected Acquisition Report). If program documentation conflicts with latest FYDP, the FYDP takes priority.

Program, product, and/or project manager
A DA board selected manager (military or civilian) of a system or program. A PM may be subordinate to the AAE, PEO, or a materiel command commander.

Prototype
An article in final form employing standard parts and representative of articles to be produced on a production line with production tooling.

Realistic operational test environment
The conditions under which a system is expected to be operated and maintained, including the natural weather and climatic conditions, terrain effects, battlefield disturbances, and enemy threat conditions.

Red team
An organizational element comprised of trained and educated members that provide an independent capability to fully explore alternatives in plans and operations in the context of the operational environment and from the perspective of adversaries and others (see JP 2–0).

Research effort or test
A technical effort or test conducted during pre-systems acquisition to determine early technical characteristics and to support the research of these items.

Safety confirmation
A formal document that provides the MATDEV and the decision maker with the test agency's safety findings and conclusions and that states whether the specified safety requirements have been met. It includes a risk assessment for hazards not adequately controlled, lists technical or operational limitations, and highlights safety problems requiring further testing (see AR 70–1).

Safety release
A formal document issued by ATEC before any hands-on testing, use, or maintenance by Soldiers. A Safety Release is issued for a specific event at a specified time and location under specific conditions. It is a standalone document that indicates the system is safe for use and maintenance by Soldiers and describes the specific hazards of the system based on test results, inspections, and system safety analysis. Operational limits and precautions are included. The Safety Release must be available before start of testing or Soldier familiarization events, to include NET (see AR 70–1).

Simulation
A method for implementing a model over time.

Software development test
A form of DT conducted by the software developer and the proponent agency to ensure that the technical and functional objectives of the system are met. These tests consist of program or module and cycle or system levels of testing. The unit or module test is the initial testing level. Testing is executed on local testbed hardware, and benchmark test files are used. This testing provides data to assess the effectiveness of the instruction code and economy of subroutines for efficient processing. It also ensures that input and output formats, data handling procedures, and outputs are produced correctly. The cycle or system test involves testing the combination of linkage of programs or modules into major processes.

Software qualification test
A system test conducted by the developmental tester using live-data files supplemented with user prepared data and executed on target hardware. The objectives of the SQT are to obtain government confirmation that the design will meet performance and operational requirements, to determine the adequacy of any corrective action indicated by previous testing, and to determine the maturity and readiness for OT.

Special operations peculiar
Equipment, materiel, supplies and services required for SO activities for which there is no Service-common requirement. These are limited to items and services initially designed for or used by SO forces until adopted for Services-common use by other DoD forces; or, modifications approved by the Commander, U.S. Special Operations Command

for application to standard items and services used by other DoD forces. This includes items and services approved by the Commander, U.S. Special Operations Command as critically urgent for the immediate accomplishment of an SO activity.

Supplemental site test
A test that may be necessary for an IT system that executes in multiple hardware and operating system environments if there are differences between user locations that could affect performance or suitability. It supplements the IOT and UAT.

Surveillance tests
Destructive and nondestructive tests of materiel in the field or in storage at field, depot, or extreme environmental sites. Surveillance tests are conducted to determine suitability of fielded or stored materiel for use, evaluate the effects of environments, measure deterioration, identify failure modes, and establish or predict service and storage life. Surveillance test programs may be at the component-through-system level.

Survivability
The capability of a system and crew to avoid or withstand manmade hostile environments without suffering an abortive impairment of its ability to accomplish its designated mission.

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, and so forth. Susceptibility is considered a subset of survivability.

Sustaining base information technology systems
Systems used for efficiently managing Army resources, managing Army installations, and deploying and sustaining the fighting force.

System
An item or group of items that consists of materiel and/or software that, when put in the hands of users, will enable those users to accomplish assigned missions.

System analysis report
Provides the detailed analyses that support a SER. It accounts for all issues and measures contained in the SEP. A system analysis report is also prepared to support an assessment report when the analysis is too detailed or inappropriate for inclusion in the EOA or OA reports while only addressing those issues and measures contained in the EOA or OA report.

System change
A modification or upgrade to an existing system. A modification is a change to a system that is still in production. An upgrade is a change to a system that is out of production. Such changes can be improvements to system capabilities or fixes to correct deficiencies after the FRP/FD decision review. System modifications and upgrades include multisystem changes (that is, the application of a common technology across multiple systems), block changes, preplanned product improvements, Class I Engineering Changes, and system change package proposals. System changes to deployed systems can be accomplished via recapitalization, technology refreshment, or other improvements (that is, modernization or modifications) that are not part of an increment acquisition strategy and/or DBS Problem Statement (see AR 70–1).

System evaluation plan
Documents the evaluation strategy and overall test/simulation execution strategy effort of a system for the entire acquisition cycle through fielding. Integrated T&E planning is documented in a SEP. The detailed information contained in the SEP supports parallel development of the TEMP and is focused on evaluation of operational effectiveness, operational suitability, and survivability. While the documents are similar, the TEMP establishes "what" T&E will be accomplished and the SEP explains "how" the T&E will be performed (see chaps 6 and 10).

System evaluation report
Documents the independent evaluation and a formal position of a system's operational effectiveness, operational suitability, and survivability to decision makers at the FRP/FD decision reviews. It addresses and answers the COIC and additional evaluation focus areas in the SEP based on all available credible data and the system evaluator's analytic treatment of the data.

System evaluator
An individual in a command or agency, independent of the MATDEV and the user, who conducts overall evaluations of a system's operational effectiveness, operational suitability, and survivability.

System test
A test that is conducted on the complete hardware/software system (including supporting elements for use in their intended environment).

System view
Shows the interrelations and dependencies of technologies, systems and other resources which support mission accomplishment. System view products provide graphical and textual descriptions of systems and system interconnections that provide or support a required military task described in the OVs. System views show system nodes (for example, Extended-Range Multi-Purpose Unmanned Aerial System, Maneuver Control System) or components, system functions, and the mapping of the operational activities and capabilities to system functions.

System–of–systems
A set or arrangement that results when independent and useful systems are integrated into a larger system that delivers unique capabilities.

Technical feasibility test
A DT conducted post milestone A to provide data to assist in determining safety, health hazards, and establishing system performance specifications and feasibility.

Technical note
Used to report and preserve lessons learned, analytical techniques, methodologies, or provide supplemental data and information on technology under T&E. The target audience of technical notes is future testers and system evaluators and other researchers, but may also be used for professional, academic and technical symposia and publications.

Test and evaluation manager
A T&E manager for a command, activity, agency, or office is an individual assigned responsibility as the organization central point of contact for all T&E matters between that organization and HQDA. As a TEMAC member, each T&E manager serves their respective organization in support of the HQDA T&E mission.

Test and Evaluation Managers Committee
The TEMAC serves as a centralized departmental committee supporting the U.S. Army T&E, acquisition, and requirements generation communities. TEMAC forges efficient and effective working relationships among materiel, system, and CAPDEVs; testers; system evaluators; user representatives; and others participating in the Army T&E process. The TEMAC undertakes studies and reviews as directed by senior Army leadership on specific HQDA T&E matters regarding: policy, procedures, organizations, and functions. The TEMAC provides coordination on T&E matters between the Army T&E Executive, ATEC, program executive offices, acquisition program/project/product management offices, ACOMs, ASCCs, DRUs, and the U.S. Army Research, Development and Engineering Command.

Test and evaluation master plan
Documents the T&E strategy that is agreed upon by all stakeholders is the primary test planning and management tool which documents the overall structure and objectives of the T&E strategy and articulates the necessary resources to accomplish each phase of test. It provides a framework within which to generate test design plans and documents schedule and resource implications associated with the T&E program. The TEMP also identifies the necessary resources to conduct DT&E, OT&E, and LFT&E activities, while providing a clear roadmap connecting evaluation issues, test objectives, requirements, test methodologies, decision points, test events, and resources. It includes an event-driven testing schedule that will allow adequate time to support pre-test predictions; testing; post-test analysis, evaluation, and reporting; reconciliation of predictive models; and adequate time to support execution of corrective actions in response to discovered deficiencies. It can be a source document when developing RFPs.

Test and Evaluation Working–level Integrated Product Team
A WG, chaired by the PM, chief developmental tester, or representative for a system, designed to optimize the use of T&E expertise, instrumentation, facilities, simulations, and modeling to achieve test integration, thereby reducing costs to the Army. The T&E WIPT ensures that T&E planning, execution, and reporting are directed toward common goals.

Test data report
Provides the detailed test description, test limitations, test team observations, and the level III (authenticated) test database dictionary. The test data report is normally prepared for OSD oversight systems.

Test design plan
A TDP contains information on test design, factors and conditions, methodology, scenarios, instrumentation, simulation and stimulation, data management, and all other requirements necessary to support the evaluation requirements stated in the SEP.

Test instrumentation
Scientific or technical equipment used to measure, sense, record, transmit, and process text, or display data during materiel testing and examination. Test instrumentation is equipment that is used to create test environments representative of natural and battlefield conditions. It is also simulators or system stimulators used for measuring or depicting threat or training, teaching, and proficiency during testing; or targets used to simulate threat objects when destruction of real objects is not practical.

Test record
A developmental TR used for ballistic test requests, customer acceptance and surveillance tests, and to report tests that use military standards and specifications.

Test report
Used to document test results, whether for DTs or OTs. For DTs, the TR is provided by the contractor or government test agencies to the T&E WIPT members and the decision review body at the conclusion of the test. For OTs, the OT TR provides the results of a test conducted on a system or concept that includes test conditions, findings, data displays, and detailed descriptions of the data collected during the test.

Test Resource Advisory Group
Implements the policies, decisions, and guidance of the T&E lead agent, as directed by the BOD Executive Secretariat. Additionally, the TRAG provides recommendations to the BOD Executive Secretariat on T&E infrastructure requirement identification and investment priorities.

Test resource plan
A formal resource document prepared for TSARC validation. It is required for all Army tests, Joint T&E, Multi-Service Operational T&E, and experiments, demonstrations, investigations, studies, and assessments/evaluations to document required resources (primarily Soldiers). The TRP documents requirements for a specific event which supports the Army approved TEMP. It identifies and contains the schedule for the required resources for a specific test event and provides administrative information necessary to support each test TRPs are also prepared for DT when Soldier participants or other operational resources are required (training ranges, OT instrumentation, flying hours, standard ammunition (DTs are exempt), or training devices). As the TSARC chair, additional TRP preparation guidance is issued by the CG, ATEC.

Test resources
All elements necessary to plan, conduct, collect, or analyze data from a test or program. Elements include test funding and support manpower (including travel costs), test assets (or units under test), test asset support equipment, flying hours, fuel and other expenditures. Also included are standard ammunition, technical data, M&S, testbeds, threat simulators, surrogates and replicas, special instrumentation unique to a given test asset or test, and targets. Further included are tracking and data acquisition instrumentation, and equipment for data reduction, communications, meteorology, utilities, photography, calibration, security, recovery, maintenance and repair, frequency management and control, and base or facility support services.

Test Scheduling and Review Committee–general officer, council of colonels, and working groups
The GO TSARC, composed of members outlined in chapter 9 of this regulation, resolves test requirement conflicts, reviews and recommends test priorities, and recommends TRPs for inclusion in the FYTP. There are two WGs (initial and mid-cycle) and a CoC TSARC. The initial WG meets semi-annually and reviews new or revised TRPs for presentation to the GO TSARC for review and comment. The mid-cycle WG normally meets approximately 6 weeks after the Initial TSARC WG to perform a similar function. The CoC TSARC normally meets approximately six weeks after the mid-cycle WG. As the advisor to the TSARC chair, the TSARC CoC ensures each submitted TRP for FYTP inclusion is based upon an Army-approved TEMP, or assess the risks of submitting a TRP for FYTP inclusion without an Army approved TEMP, directs that a previously approved TRP be resubmitted as an out-of-cycle TRP when there is significant change in needed resources, and provides recommendations for additional test synchronization opportunities not already documented in an approved TEMP. When a test requirement conflict cannot be resolved, the TSARC CoC proposes recommendations to the GO TSARC for final resolution and submission to DCS, G–3/5/7 for approval of the FYTP.

Test synchronization
Test synchronization is an overarching term which encompasses bundling tests and/or integrating tests for two or more programs of record to gain resource efficiencies (time, money, people, and assets) and an enhanced data set to ensure that systems can interoperate and work effectively together while consolidating tests to reduce the burden on operational forces.

Testbeds
A system representation consisting partially of actual hardware or software or both, and partially of computer models or prototype hardware or software or both.

Theater and tactical information systems
Systems that direct, coordinate, and support deployable combat, combat support, and combat service support forces in their projection of combat power. This projection of power is throughout the spectrum of combat service support forces throughout the spectrum of combat (peace, transition to and from conflict, and conflict). A theater and tactical information system is an item that a table of organization and equipment unit requires to perform its mission and functions.

Threat test support package
A test specific document that provides a comprehensive description of threat to U.S. systems being tested and targets the system will engage (see AR 381–11). A threat TSP is required for all operational testing of materiel systems

Trainer
The agency that trains personnel to operate and maintain systems, TRADOC–ARCIC is the trainer for most equipment.

Training aids, devices, simulators, and simulations
TADSS simulates or demonstrates the function of equipment or weapon systems. These items are categorized as follows:
a. Standalone training aids, devices, simulators, and simulations. An autonomous item of training equipment designed to enhance or support individual or collective training.
b. Embedded. Training that is provided by capabilities designed to be built into or added onto operational systems to enhance and maintain the skill proficiency necessary to operate and maintain that system. Embedded training capabilities encompass four training categories:
(1) Category A–Individual/operator. To attain and sustain individual, maintenance, and system orientation skills.
(2) Category B–Crew. To sustain combat ready crews/teams. This category builds on skills acquired from Category A.
(3) Category C–Functional. To train or sustain commander, staffs, and crews/teams within each functional area to be utilized in their operational role.
(4) Category D–Force Level (Combined Arms Command and Battle Staff). To train or sustain combat ready commanders and battle staffs utilizing the operational system in its combat operational role.
c. System. A TADSS item that supports a specific materiel system or of systems program.
d. Nonsystem. All TADSS not defined as system TADSS.
e. Simulators. A training medium that replicates or represents the functions of a weapon, weapon system, or item of equipment generally supporting individual, crew, or crew subset training. Simulators may stand alone or be embedded.
f Simulations. A training medium designed to replicate or represent battlefield environments in support of command and staff training. Simulations may stand alone or be embedded.

Training developer
Command or agency that formulates, develops, and documents or produces training concepts, strategies, requirements (materiel and other), and programs for assigned mission areas and functions. The training developer assists HQDA (DCS, G–3/7/TR), the Army T&E Executive, TRADOC, and the PEO for Simulation, Training, and Instrumentation in identifying opportunities to integrate testing and training support technologies to increase overall cost efficiency without negatively impacting mission requirements. In coordination with the responsible MATDEV, the training proponents training developer will plan T&E for system and nonsystem TADSS, as deemed appropriate. Planning for TADSS in DTs and/or OTs will be coordinated early in the RDT&E process to ensure efficient use of resources required to yield the data necessary to satisfy common needs of the proponent, independent system evaluators and logisticians

Training test support package
A package that consists of materials used by the training developer/trainer to train test players and by the system evaluator in evaluating training on a new system. This includes training of doctrine and tactics for the system and maintenance on the system. It focuses on the performance of specific individual and collective tasks during the OT of a new system. The Training TSP is prepared by the proponent training developer and trainer that represent the individual, collective, and unit training for the system when initially fielded.

Upgrade
An upgrade is a change to a system that is out of production. Such changes can be improvements to system capabilities or fixes to correct deficiencies.

Validation
The process of determining the degree to which a test capability (such as, instrumentation and stimulators), model or simulation and its associated data are an accurate representation of the real world from the perspective of the intended uses of the model. Validation methods include expert consensus, comparison with historical results, comparison with test data, peer review, and independent review (see AR 5–11).

Verification
The process of determining that a test capability (such as instrumentation and stimulators), model or simulation implementation and its associated data accurately represents the developer's conceptual description and specifications. Verification evaluates the extent to which the model or simulation has been developed using sound and established software engineering techniques (see AR 5–11).

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.

Vulnerability assessment team
In reference to CEMA survivability T&E, a team of highly skilled individuals who conduct systematic examinations of information systems or products from within the target to the following:
a. Determine adequacy of security measures.
b. Identify security deficiencies.
c. Predict effectiveness of proposed security measure.
d. Confirm adequacy of such measures after implementation.

Warfighting experiments
A group of experiments with representative Soldiers in as realistic an operational environment as possible via application of constructive, virtual, and live simulation to produce insights supporting requirements determination. They examine—
(1) Whether the warfighting concepts are achievable and effective.
(2) Military utility and burdens of new and existing technologies.
(3) Utility and contribution of new ideas and approaches in doctrine, TTPs, training, leader developments, organization design, and Soldier specialties/abilities. Experimentation may be either a single discrete event or an iterative progressive mix of simulations as necessary to support development and/or refinement of warfighting concepts, future operational capabilities, the DOTMLPF–P needs determination analysis report, and ICD. Experiments are conducted by or under the oversight or assistance of one or more Battle Laboratories or Army proponents with warfighting requirements determination missions. Examples of warfighting experiments include JCTD and ATD Battle Laboratory demonstration events.

Working–level integrated product team
Teams composed of headquarters and component functional personnel who support the MATDEV by focusing on a particular topic such as T&E, cost analysis, performance analysis, and similar activities. An Integrating IPT will coordinate all WIPT efforts and cover all topics not otherwise assigned to another WIPT. The MATDEV or his designee will usually chair WIPTs. WIPTs provide empowered functional knowledge and experience, recommendations for program success, and they communicate status and unresolved issues concerning their areas of responsibility.

Section III

Special Abbreviations and Terms
This section contains no entries.