

DoD AUTOMATIC TEST SYSTEMS EXECUTIVE DIRECTORATE

DoD AUTOMATIC TEST SYSTEMS MASTER PLAN

2012

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REFERENCES

- (a) USD(AT&L) memorandum of 28 July 2004
- (b) DoD Instruction 5000.02 of December 2, 2008
- (c) DoD Directive 4151.18 of March 31, 2004
- (d) DoD ATS Joint MOA among Service Acquisition Executives of September 2004
- (e) 2009 DoD ATS Selection Process Guide
- (f) OUSD(A&T) memorandum of 2 February 2004
- (g) USAF DAF memorandum of 26 November 2007
- (h) USAF ATS PGM memorandum of 31 March 2011

1.0 Executive Summary

This document provides a consolidated Master Plan for the implementation of the Department of Defense (DoD) Automatic Test System (ATS) acquisition policy and investment strategy. It examines the historical evolution of DoD ATS acquisition management policy, describes the Services' ATS management organizations, identifies the major participants in the DoD ATS management structure, and defines the evolving DoD ATS modernization strategy.

The plan elaborates the management processes involved in implementing the DoD ATS procurement policy stated in references (a), (b) and (c) which direct Services to satisfy Automatic Test Equipment (ATE) hardware and software needs by using designated ATS families as the preferred solution to minimize total life-cycle cost of ownership. The ATS Master Plan presents established criteria for designating future DoD ATS families and for adding testers to current designated families. It discusses the process for obtaining approval to acquire automatic testers that do not comply with DoD ATS policy. It references the tools required for selecting and implementing ATS solutions to satisfy weapon system requirements using the DoD ATS Selection Process Guide.

The ATS Master Plan is published pursuant to the agreement among the Service Acquisition Executives (SAEs) as documented in the Joint Memorandum of Agreement, reference (d). The DoD ATS Executive Directorate (ATS ED) is responsible for reviewing and updating the DoD ATS Master Plan on a regular basis. The 2012 DoD ATS Master Plan supersedes and replaces the 2009 and previous DoD ATS Master Plans.

2.0 DoD ATS Policy, Goals and Strategy

2.1 Background

A brief history of the significant events that resulted in the present DoD ATS acquisition policy and the establishment of the ATS Executive Directorate and its predecessor ATS Executive Agent (EA) organization is provided below:

29 April 1994: Following congressional direction in 1992 and 1993, OSD (A&T) released policy on ATS acquisitions and which stated that DoD components shall satisfy all acquisition needs for Automatic Test Equipment (ATE) hardware and software by using designated ATS families. The memorandum further designated the Army's Integrated Family of Test Equipment (IFTE) and the Navy's Consolidated Automated Support System (CASS) as the initial DoD ATS families, and specified that commercial off-the-shelf (COTS) testers and components are permitted for use at Depot and Factory levels of maintenance. The memorandum appointed the Navy as the DoD Executive Agent for ATS (ATS EA) and requested a coordinated Executive Agent Charter for issuance as a DoD Directive, recommended organizational and funding adjustments to implement this policy, and proposed acquisition changes to be incorporated in DoD Directive 5000.2.

10 June 1994: The Assistant Secretary of the Navy for Research, Development and Acquisition (ASN(RD&A)) issued a memorandum in which ASN(RD&A) undertook the assignment as ATS EA and accepted the following responsibilities:

- 1. definition and management of DoD ATS standards;
- 2. guiding ATS family product engineering;
- 3. establishment of ATS Research & Development (R&D) requirements;
- 4. review of ATS specifications and procurements;
- 5. maintenance of a waiver process for OUSD(A&T); and
- 6. service as ATS Lead Standardization Activity.

ASN(RD&A) appointed the Naval Air Systems Command, Aviation Support Equipment Program Office (PMA260) as Director of the Executive Agent Office (ATS EAO). As required by OUSD(A&T), the Army, Air Force and Marine Corps assigned ATS Senior Executives who are responsible for ATS management within their Services. To coordinate ATS matters across the Services, the ATS EAO established an ATS Management Board (AMB) comprised of the O-6 level ATS leaders in each of the Services plus US SOCOM.

10 January 1997: The DoD ATS Selection Process Guide, (reference (e)), was first promulgated to present the processes and procedures to be used by Program Managers (PMs) throughout DoD to select the appropriate ATS solution to meet the testing requirements for their weapon systems. The Guide included software models to assist in the cost benefit analyses and described the policy deviation process to be followed when use of a DoD designated ATS family is not the optimal solution.

6 February 1997: The ATS Executive Agent forwarded to the Component Acquisition Executives a Joint Memorandum of Agreement to document processes and procedures to be used in the acquisition of automatic test systems.

2 February 2004: As a result of a GAO audit of DoD automatic testing, OSD, via reference (f), directed that Navy (NAVAIR PMA260) serve as the DoD ATS Executive Directorate (ATS ED) and perform the functions previously performed as the DoD ATS EAO.

22 June 2004: In accordance with OSD direction, the Deputy Assistant Secretary of the Navy (Logistics) accepted the role of DoD ATS Executive Director and reiterated that NAVAIR PMA260 will continue the supporting and implementing functions previously discharged as the DoD ATS EAO.

September 2004: The Army, Navy and Air Force SAEs signed the Joint MOA (reference (d)) and agreed to the policies and procedures contained in this ATS Master Plan.

2.2 DoD ATS-related Policy

Reference (a) states the following ATS policy: "To minimize the life cycle cost of providing automatic test systems for weapon systems support at DoD field, depot, and manufacturing operations, and to promote joint service automatic test systems interoperability, Program Managers shall use approved DoD ATS Families as the preferred choice to satisfy automatic testing support requirements. Commercial-off-the-Shelf (COTS) solutions that comply with the DoD ATS Technical Architecture should only be used if the Milestone Decision Authority concurs that an approved DoD ATS Family will not satisfy the requirement. Automatic Test System selection shall be based on a cost and benefit analysis over the system life cycle." While this policy was issued via letter, it was summarized in reference (b) with the statement: "….a preference for approved DoD Automatic Test Systems (ATS) Families to satisfy ATS requirements."

Consistent with the above, reference (c) states that the maintenance programs shall minimize total life-cycle cost of ownership, minimize footprint, and use standardized support equipment.

The intent of references (a), (b) and (c) is to define an acquisition environment that makes DoD the smartest, most responsive buyer to meet our warfighters' needs while reducing the total cost of ownership. This will be accomplished through the use of ATS Families as the preferred choice to satisfy automatic testing support requirements. An attachment to reference (a) designates the following DoD ATS Families:

- Consolidated Automated Support System (CASS)
- Integrated Family of Test Equipment (IFTE)
- Marine Corps Automatic Test System (MCATES)
- Joint Service Electronic Combat Systems Tester (JSECST)

Additionally, the USAF in references (g) and (h) provides guidance on procurement of Automatic Test Systems and includes Air Force's Versatile Depot Automatic Test Station (VDATS) in the list of approved tester families.

The objective of the DoD ATS policy is also to minimize unique types of ATS in DoD, thereby reducing redundant ATS non-recurring investments and lessening logistics burdens and long-term costs. By minimizing unique ATS acquisitions through employment of standard family ATS, DoD seeks to leverage its ATS investment assets across the entire DoD establishment.

2.3 DoD ATS Goals

Under the guidance of the OSD AT&L Deputy Assistant Secretary of Defense for Maintenance Policy and Programs (DASD MPP), the DoD ATS Executive Directorate has established four main goals for DoD ATS:

2.3.1 Reduce the Total Cost of Ownership of DoD ATS

The primary DoD ATS goal is to reduce the total cost of ownership of DoD ATS. The key to attaining this goal has been stopping the proliferation of unique test systems by standardizing on designated ATS families or acquiring "validated" COTS test systems. Additionally, ATS selections are based on a cost and benefit analysis over the complete system life cycle.

2.3.2 Interoperable ATS

The flexibility required by the warfighter in modern conflict scenarios requires that the Services move toward the capability for interoperability among Automatic Test Systems. Interoperability of ATS functions is needed within the Services and across the Services. The closed architectures of most legacy DoD Automatic Test Systems prohibit interoperability. Standards need to be defined to help the DoD move toward this interoperability goal.

2.3.3 Reduce Logistics Footprint

The need to rapidly deploy support, along with weapon systems, requires that all logistics footprint be minimized.

2.3.4 Improve the Quality of Test While Reducing Repair Cycle Time

Improving the quality of diagnostics and fault isolation will reduce the time required to test, repair and return to service failed systems and components. This will in turn lead to reduced requirements for spares and reduced repair cycle time.

2.4 DoD ATS Management Strategy

The DoD ATS Executive Directorate is implementing the four goals through a five-step ATS strategy:

1. Use designated DoD ATS families to reduce total ownership costs.

2. Implement a DoD ATS Technical Architecture Framework to serve as the target to which all DoD ATS will evolve

3. Services jointly develop test technologies and leverage each other's investments in ATS-related R&D

4. Periodic "snapshot in time" system-level demonstrations of the technologies

5. Given their different maintenance operational environments, Services execute their own implementations of the ATS technologies and the ATS Framework through technology insertions or acquisition of new systems

The ATS ED has published a DoD ATS Acquisition Handbook to aid the Program Manager who is unfamiliar with automatic testing of electronic systems and the acquisition process for Automatic Test Systems. Its purpose is to provide in a simplified, non-technical format all the information needed to make educated decisions concerning off-system automatic testing of electronic components in the PM's weapon system. The ATS Acquisition Handbook may be downloaded from the ATS ED Web Site at http://www.acq.osd.mil/ats.

2.5 Service ATS Acquisition Strategy

2.5.1 Army ATS Acquisition Strategy

ATS provides a highly mobile, rapidly deployable, general purpose, reconfigurable testing, screening, and repair capability for Army weapon systems to maintain their readiness to shoot, move, and communicate. This facilitates the diagnosis and repair of critical components at the unit and sustainment levels of maintenance providing rapid logistical support to legacy and future warfighter combat platforms.

The supported platform's maintainer finds a problem with a weapon system capability and, when available, replaces the defective Line Replaceable Unit (LRU), rapidly returning the platform to its combat/support mission. The intent of ATS is to diagnose/screen the replaced LRU allowing the soldier to repair the faulty component and return it for issue as needed. Previously, defective equipment was retrograded to a depot or OEM for test and repair. The ATS facilitates forward area rapid repair and availability of critical components, as well as significantly reducing time and expense related to "no evidence of failures" (NEOF).

Current and future Army's ATS programs support the current Modular Force structure. The Direct Support Electrical System Test Set (DSESTS), originally deployed in the early 1980s, is a system-specific ATS which supports only Abrams and Bradley variants. The Integrated Family of Test Equipment (IFTE) Base Shop Test Facility Version 3 (BSTF(V)3), originally deployed in early 1990s, supports a variety of ground combat systems and limited aviation components. The IFTE BSTF(V)5 (also known as the Electro-Optics Test Facility (EOTF)) currently being fielded provides support to Kiowa OH-58D Mast Mounted Sights electro-optical LRUs at field aviation intermediate maintenance (AVIM) support activities. In development is the IFTE BSTF(V)6, also known as the Next Generation ATS (NGATS), which will be the latest ATS of the Army's IFTE product line. NGATS represents the Army's implementation of the multi-service Agile Rapid Global Combat Support System (ARGCS) Advanced Concept Technology Demonstration (ACTD). NGATS will be capable of assuming all current and projected ATS missions.

The spiral development of capabilities will allow the planned incremental replacement of aging ATS experiencing increasing obsolescence issues. The NGATS is designed with backward compatibility to replace DSESTS beginning in FY12, IFTE BSTF(V)3 in FY16, and IFTE BSTF(V)5 in FY18. This evolutionary strategy will yield one common Army ATS, NGATS, which be networked within the Army logistics system to support the US Army's Common Logistics Operating Environment (CLOE).

The Army vision for the repair of electronic and electro-optic components for Army Transformation is standardized ATE, incorporating an open architecture to accommodate technology improvements. The open architecture standards for ATE will be outlined in future Army Technical Architecture revisions.

2.5.2 Navy/Marine Corps Air ATS Acquisition Strategy

The Navy fully embraces the objective of minimizing unique types of ATS to reduce non-recurring investments in ATS and to lessen operating and support costs.

The ATS acquisition strategy of the Navy (including Marine Corps Air) is to build around CASS as the Navy's standard Family of ATE. This policy was first published in SECNAVINST 3960.6 in 1990 and continues in OPNAVINST 3960.16A and NAVAIRINST 13630.2 series. ATS acquisitions are managed centrally by NAVAIR PMA260 who is responsible for ensuring that all Navy ATE acquisition programs follow Navy policy.

Navy ATS selection decisions are based on objective analytical analysis using the System Synthesis Model Plus (SSM+). Per Navy policy, the first priority in selecting a tester for a given requirement will be to use one of the standard Navy CASS family configurations. If the need cannot be satisfied by CASS, other DoD families such as NGATS or VDATS will be the next choice. New design ATE will be an alternative of final resort only.

The Navy fully supports implementation of ATS ED-approved ATS critical framework elements and specifications in the DoD ATS Technical Architecture Framework.

The Navy encourages programs to use field (Intermediate and Organizational level) testers in the factory test environment to ease the vertical transport of costly test programs.

2.5.3 Air Force ATS Acquisition Strategy

The Air Force fully supports the standardization of ATS from flight line to depot maintenance.

In a 27 November 2007 Memorandum (reference (g)), the Integrated Life Cycle Management (ILCM) Framework identified the 742 CBSG at Robins AFB as the ATS leadership office for the Air Force. The ILCM directed that all Air Force ATS requirements, whether for new, replacement, modification, Organizational, Intermediate, or Depot, will be coordinated through the 742 CBSG/CC for approval. The 742 CBSG, since re-designated WRALC/GRN, the ATS Product Group Manager, will either provide a solution for a program's ATS requirement or process a system program office or procuring program office drafted waiver through the DoD ATS Management Board. This policy was re-emphasized in reference (h).

In FY09 the Air Force's Versatile Depot Automatic Test System (VDATS) was identified as a member of the DoD's standard family of testers. As stated in reference (h), the Air Force's first priority in selecting a tester for a weapon system requirement is to use the VDATS family of testers or other DoD designated AF Standard Family of testers. If the requirement cannot be satisfied by an DoD designated AF Standard Family tester, then other DoD approved families such as CASS or IFTE will be considered. Next, existing supportable ATS inventory will be considered. Investing program dollars to develop a new ATS will be an alternative of last resort and must be substantiated by a business case analysis approved by WR-ALC/GRN. All new-design ATS and modifications to add new workload to an existing tester must consider inclusion of the critical framework, elements, and specifications in the DoD ATS Technical Architecture Framework.

2.5.4 Ground USMC ATS Acquisition Strategy

The Ground USMC ATS policy objective is to minimize unique types of ATS and make a standard suite of ATS available to support USMC weapon systems. This ATS suite covers all echelons of Ground Marine maintenance and is referred to as the Marine Corps Automatic Test Equipment Systems (MCATES). ATS acquisition is centrally managed by the Program Manager for Test Measurement and Diagnostic Equipment (PM-TMDE, MARCORSYSCOM PMM-161). An ATS policy is in force that requires all programs to base their support primarily on MCATES unless an analysis shows that an alternative ATS provides a more economical solution. Where feasible, PM-TMDE will promote the use of DoD-designated families. Existing waivers to the use of standardized ATE remain in effect. However, ground system program managers should plan to bring legacy systems into compliance with Marine Corps ATS policy when it is cost effective. Any alternative ATS solution must address compatibility with the current standard ATS and procurement approval obtained from PM-TMDE.

The concept of an open architecture is critical to future evolutions of ATS. The USMC's goal is to apply open architecture standards on all technology improvements to MCATES and focus on compatibility with DoD ATS families as ATS evolves.

The Marine Corps employs Automatic Test Systems that are capability targeted and fielded to units that will only utilize the inherent functions of the ATS they have on hand. This flexibility maximizes mission accomplishment and reduces the unit's overall operational footprint.

The intent is to continuously improve field level weapon system diagnosis and repair with small, yet capable, ATS that belong to the standard MCATES family of ATS. This is accomplished through spiral development with technology insertion to improve the capability of current ATS or implementation of new generations of ATS to provide smaller more capable ATS. As an example, the AN/USM-717 family of ATS is intended to complete the original Authorized Acquisition Objective (AAO) of the AN/USM-657 ATS but introduces a smaller footprint while at the same time increasing the operational characteristics in an effort to expand the level of support provided.

The intent is to provide a MCATES family of ATS that can be reconfigured to the smallest footprint possible with the capability needed to complete the mission. To solve the requirement for an operator/crew and organic level test capability of software-defined hand-held

radios, a smaller component of the MCATES family, the AN/USM-718 Ground Radio Maintenance Automatic Test System (GRMATS), was designed to meet this new requirement. The GRMATS will allow the operator/crew unit to increase readiness on the line by diagnosing equipment at the lowest possible echelon of maintenance.

The next generation of ATS is currently under design and will provide the Marine Corps with the latest technology in a lightweight, rugged platform that will provide users with a scalable organic capability that will be responsive and flexible enough to support our Marines. The intent is to become a horizontal maintenance integrator by providing ATS that mitigates risk and provides economies of scale by sharing resources across different weapon system platforms. This Performance Based Logistics approach will improve the readiness of platforms by identifying trends thereby allowing the warfighter to operate and sustain the force from the sea more effectively.

3.0 Management of DoD ATS

The Deputy Assistant Secretary of Defense for Maintenance Policy and Programs (DASD MPP) provides oversight and guidance for DoD ATS ED functions and activities. Per reference (d), the Army, Navy and Air Force SAEs agreed to:

1. Ensure compliance with DoD ATS policy and provide Service-specific policy for acquisition of ATS,

2. Provide appropriate Service representatives to serve on the ATS Management Board and on its various Integrated Product Teams, and

3. Provide appropriate R&D resources to support Joint Service test and diagnostics technology R&D efforts.

3.1 ATS ED Organization

The DoD ATS Organization is graphically depicted in Figure 1.

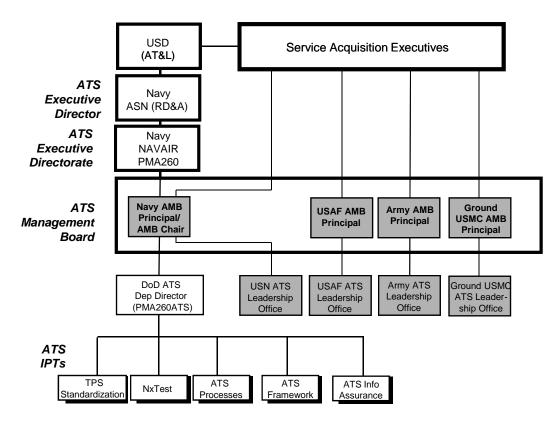


Figure 1: DoD ATS Organization

3.1.1 ATS Executive Directorate

Among other things, the ATS ED is responsible for overall management and coordination of ATS policy implementation among the Services. Specific tasks assigned by OSD and the Service Acquisition Executives include:

1. Sponsor and serve as chair of the ATS Management Board

2. Develop and publish, with AMB concurrence, a strategic plan for DoD ATS

3. Establish and charter Integrated Product Teams and Working Groups as necessary

4. Develop and publish, with AMB concurrence, a coherent DoD-wide R&D program plan that integrates Service ATS R&D efforts

5. Approve and implement, with AMB concurrence, ATS interface specifications and rules, and coordinate their inclusion in the DoD Information Technology Standards Registry (DISR)

6. Serve as the designated DoD voting member on IEEE's Standards Coordinating Committee 20

7. Serve as DoD's representative to industry consortia and foundations such as the Interchangeable Virtual Instrument Foundation, LXI Consortium, the National Defense Industrial Association Automatic Testing Committee, and the Test and Diagnostics Consortium

8. Make acquisition recommendations to Service PMs and MDAs, and inform MDAs and SAEs in cases when PMs select a non-policy compliant ATS solution

9. Assist DoD Program Managers by developing, in conjunction with the AMB, and publishing decision-making tools such as the DoD ATS Master Plan, the DoD ATS Selection Process Guide and the DoD ATS Handbook

10. Approve, with AMB concurrence, ATS Family designation requests and designate new ATS families

3.1.2 ATS Management Board

The O-6 level ATS Management Board is a Joint-Service board comprised of representatives from the Army (PM JCSS/PD TMDE), Air Force (WRALC/GRN ATS PGM), Marine Corps (MARCORSYSCOM (PMM-161, PM TMDE)), and Navy (NAVAIRSYSCOM, PMA260). Chaired by the Director of the ATS ED, the AMB provides advice and recommendations to the ATS ED and to Weapon System PMs and IPTs (WIPTs). The AMB also reviews policy deviation requests, and provides recommendations to the appropriate decision authority. The AMB will:

1. Provide advice and recommendations to the SAEs, MDAs, PMs and WIPTs on ATS matters

2. Define, coordinate and manage DoD ATS acquisition and oversight processes

3. Perform ATS analyses and coordinate Joint Service ATS actions, including sponsoring Joint ATS R&D initiatives

4. Develop and implement processes as required to support DoD's ATS policies, and assist the Executive Director in developing tools to assist DoD PMs with ATS-related decisions

5. Monitor ATS policy compliance by reviewing ATS acquisitions and modernization planning

6. Define the criteria for new ATS families and review ATS Family designation requests

3.1.3 Integrated Product Teams

Several IPTs have been chartered under the ATS ED and AMB to carry out the main technical functions of the ATS ED. Key points of contact within the ATS ED and each Service ATS organization are provided in Attachment (1) and are available to assist and advise WIPTs on these processes.

Presently, there are five Joint IPTs serving under the auspices of the ATS ED:

3.1.3.1 NxTest IPT

The Next Generation Test (NxTest) IPT serves as the Joint Services ATS Technology Team. Its purpose is two-fold: first, to define the elements that contribute to achieving DoD's ATS goals, and to structure and evolve ATS technical architectures to achieve these goals. The second purpose of the NxTest IPT is to define, develop, demonstrate and plan implementation of emerging test technologies into the DoD maintenance test environment. The principal members of the NxTest IPT are Army Picatinny, NJ (AMSRD-AAR-AEF-A, NxTest Team Leader), Navy (NAWCAD 4.8), USAF (ATS PGM) and USMC (MARCORSYSCOM PMM161, PM TMDE).

3.1.3.2 ATS Framework IPT

The ATS Research and Development IPT (ARI), which originally developed the ATS Technical Architecture Framework, was merged into the NxTest IPT in 2002 as the ATS Framework Working Group (FWG). In 2011, the FWG was elevated to an IPT by the AMB. The FW IPT focuses on continuing development of the ATS Technical Architecture Framework to support ATS convergence, Test Program Set (TPS) transportability, and elimination of the requirement for Service-unique ATS. The FW IPT has defined elements of the framework as hardware and software components, interfaces between components, information models for required data entities and data relationships, and rules and processes for describing how components, interfaces and information models must interact. The FW IPT Steering Committee is chaired by Navy (NAWCAD Lakehurst 4.8.3.1), and includes members from USAF (ATS PGM), Army (PD TMDE), and USMC (MARCORSYSCOM PMM-161/PM TMDE and TMDE Department, ATEP Branch, MCLB, Albany GA).

3.1.3.3 TPS Standardization IPT

The ATS Test Program Set (TPS) Standardization IPT (TPSS IPT) is chartered to review and standardize TPS engineering, logistics and acquisition processes. It developed a TPS performance specification, MIL-PERF-32070, and its successor, MIL-PERF-32070A. This IPT is chaired by Navy (NAVAIR PMA260), and includes members from USAF (ATS PGM), Army (PD TMDE), and USMC (TMDE Department, ATEP Branch, MCLB, Albany GA). While coordinating closely with the NxTest IPT, the TPSS IPT is currently focused on defining the next generation test programming language, development tools, and sustainment approaches.

3.1.3.4 ATS Processes IPT

The ATS Processes IPT is responsible for developing ATS acquisition processes and procedures. It develops and updates the DoD ATS Master Plan and DoD ATS Selection Process Guide. The IPT is chaired by Navy (NAVAIR PMA260) and membership includes representatives from USAF (ATS PGM), Army (PD TMDE), and USMC (MARCORSYSCOM PMM-161/PM-TMDE).

3.1.3.5 ATS Information Assurance IPT

The ATS Information Assurance IPT is responsible for developing an ATE-tailored IA architecture which allows for Global Information Grid (GIG) connectivity and net-centric operations. The purpose of the IPT is two-fold: first, to define the elements that contribute to the above mission and structure a GIG-compliant IA architecture to achieve the mission. The generic ATS IA architecture must support new diagnostics needs and permit flexible insertion of new technology with minimum impact on existing ATS components. The second purpose of the IA IPT is to define, develop, demonstrate and plan implementation of emerging IA technologies into the DoD ATS environment. The IPT is chaired by Navy (NAVAIR PMA260) and membership includes representatives from USAF (ATS PGM), Army (PD TMDE), and USMC (MARCORSYSCOM PMM-161/PM-TMDE).

3.1.4 Service Program Managers and Program Executive Officers

Per direction of the Service Acquisition Executives in reference (d), PMs and PEOs will: 1. Comply with OSD and Service ATE/ATS-related policy when acquiring and modernizing automatic test systems, and

2. Develop cost and benefit analyses over the system life cycle upon which to base any ATS selection.

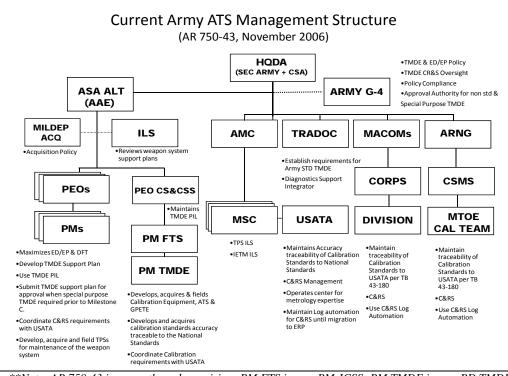
3.1.5 Service ATS Leadership Offices

Each Service has established an ATS Leadership Office (ALO) with oversight of their Service's implementation of the ATS policy and primary responsibility for ATS coordination. The ALO has the lead for coordinating Joint Service projects and is represented on the various Joint Service ATS IPTs and working groups. These organizations include subject matter experts in the areas of the ATS selection process, preparation of Cost Benefit Analyses (CBAs), TPS acquisition, and ATS capabilities. The office ensures that ATS policy and related procedures are promulgated throughout their Service, provides assistance to weapon system PMs and IPTs in ATS matters, and monitors acquisition and modernization planning for policy compliance. The ALO processes ATS policy deviation requests and forwards them to the AMB.

3.2 Service Organizations

ATS management functions required to implement the DoD ATS policy discussed above are performed by the following Service organizations:

3.2.1 Army Organization



Note: AR 750-43 is currently under revision; PM FTS is now PM JCSS; PM TMDE is now PD TMDE; USATA reports through Army Aviation and Missile Command (AMCOM) to AMC

Figure 2 – Army ATS Management Structure

The DA focal point for TMDE policy is the DCS, G–4. To aid in the effective development, distribution, calibration repair, funding, and modernization of all TMDE, a total Army centralized management structure under HQDA has been established.

The Commanding General, United States Army Materiel Command (USAMC), is the national sustainment maintenance manager for the Army. The CG, USAMC and the Army Acquisition Executive (AAE) are the principal agents for executing Army TMDE policy and program. In the management structure depicted above, each agent is designated authority to recommend TMDE policy to HQDA and to plan, program, budget, acquire, deploy, sustain, and otherwise manage DA TMDE functions within their assigned areas of responsibility.

3.2.2 Navy Organization

The intra-Navy forum for management of Navy ATS issues is the Navy Test and Monitoring Systems (TAMS) Executive Board (EB) which is chaired by the Naval Sea Systems Command (NAVSEA 04). NAVSEA is the lead Systems Command for TAMS. NAVAIR was designated as ATE Lead Systems Command by OPNAV and NAVSEA. NAVAIR (PMA260) is a member of the TAMS EB. The TAMS EB has chartered an Automatic Test & Diagnostics Standing Committee (ATDSC) for the purpose of reviewing NAVAIR, NAVSEA, SPAWAR, MARCORSYSCOM, and DIRSSP ATE and TPS management processes. The TAMS ATDSC is responsible for recommending process improvements to the TAMS EB. The ATDSC is chaired by the NAVAIR Deputy Program Manager for Avionics Support Equipment (PMA260D). Membership is comprised of ATS managers from NAVSEA, SPAWAR, MARCORSYSCOM, DIRSSP, and the ATS ED.

Within the Navy, ATS is divided into two groups: common ATS applicable to multiple weapons systems, and peculiar ATS applicable to a single weapon system. Primary acquisition responsibility for peculiar ATS and for weapon system TPSs lies with the appropriate weapon system PM. The primary acquisition manager for common ATS within the Navy is NAVAIR PMA260. The responsibility for integrating the total Navy ATS program lies with NAVAIR PMA260 in coordination with NAVSEA for NAVSEA/DIRSSP programs, SPAWAR for space and warfare programs, and MARCORSYSCOM for Marine Corps non-aviation programs.

3.2.3 Air Force Organization

The ATS Product Group Manager (PGM) at WRALC/GRN is the Air Force Single Manager for ATS. The ATS PGM's role is to implement AF policy and manage all common and some peculiar Air Force ATS, and to provide ATS requirements solutions, acquisition, and staff representatives from Logistics (A4) and acquisition (AQ) on ATS matters including policy to reduce the ATS proliferation of past decades and to foster an approach which supports open architecture and future workload transportability at the lowest life cycle cost. Additionally, the AF ATS PGM addresses ATS requirements, funding, policy compliance, status of acquisition programs, and sustainment issues with HQ AFMC, program offices, using commands, and depots.

The ATS PGM is the Air Force member of the ATS Management Board (AMB).

3.2.4 Marine Corps Organization

The Marine Corps Systems Command (MARCORSYSCOM) is responsible for the acquisition of weapon systems used by non-aviation Fleet Marine Forces. MARCORSYSCOM Program Managers are assigned the primary responsibility for weapon system acquisition, including any special purpose test equipment. MARCORSYSCOM PMM-161 (PM TMDE) is responsible for the procurement and life cycle management of General Purpose Electronic Test Equipment, to include Automatic, Electronic, Electro-Optical and Mechanical test equipment. TMDE provides test equipment support recommendations for systems that MARCORSYSCOM procures. TMDE has recently been given the responsibility for developing TPSs for fielded systems where the implemented support concept needs to be upgraded with ATE support. TMDE also provides technical assistance in the validation of requirements for Special Purpose Test Equipment. Classic examples are dedicated test sets, special tools and TPSs. NAVAIR manages all Marine Corps ATS requirements for aviation maintenance.

4.0 DoD ATS Families

An ATS family consists of ATSs that are interoperable and have the capability to support a variety of weapon system test requirements through flexible hardware and software architectures. These structures permit addition or expansion of testing capability with minimal impact to the ATS logistics support profile, system software, and Test Program Sets (TPSs).

DoD has promulgated its policy that the Services' acquisition needs for ATE hardware and software will be satisfied by using designated ATS families or commercial components that meet defined critical elements. An attachment to reference (a) designates the following DoD ATS families:

- Consolidated Automated Support System (CASS)
- Integrated Family of Test Equipment (IFTE)
- Marine Corps Automatic Test Equipment Systems (MCATES)
- Joint Service Electronic Combat Systems Tester (JSECST)

As stated in paragraph 2.2, USAF's VDATS is also included in the list of approved DoD ATS families.

4.1 Consolidated Automated Support System (CASS)

The Consolidated Automated Support System was developed by the Naval Air Systems Command as the Navy's standard ATE for intermediate, depot and factory level support, both ashore and afloat, of all Navy electronics from aircraft to ships and submarines. The basic CASS configurations are as follows:

- 1. Hybrid (HYB),
- 2. Radio Frequency (RF),
- 3. Communications, Navigation, and Interrogation (CNI),
- 4. Electro-Optical (EO), and
- 5. High Power (HP)

The CASS Hybrid station provides the core test capability for general purpose electronics, computers, instruments, and flight controls. The RF station provides Hybrid station test capability plus ECM, ECCM, EW Support Measures, Fire Control Radar, Navigation Radar, Tracking Radar, Surveillance Radar, and Radar Altimeter support capability. The CNI station provides all RF station capability plus communication, navigation, interrogation, and spread spectrum system support capability. The EO station provides Hybrid station test capability plus support capability for Forward Looking Infrared, Lasers/Designators, Laser Range Finders, and Visual Systems. The HP station supports high power radar avionics.

Reconfigurable Transportable CASS (RTCASS) is a man-portable CASS configuration using COTS hardware and software to meet V-22 support requirements as well as to replace mainframe CASS stations at USMC fixed wing aircraft (EA-6B, F/A-18 and AV-8B) and rotary wing (H-1 and H-53) support sites.

For further information on CASS station test capabilities, see http://www.acq.osd.mil/ats.

The 613th and final mainframe CASS station was delivered in December 2003. RTCASS production began in 2004 and will continue through 2012. When production is complete, Navy will have acquired over 700 mainframe and RTCASS stations.

CASS TPSs are being delivered for both new requirements and for off-load of legacy ATE such as RADCOM, CAT IIID, HTS, IMUTS, etc. The total support objective for CASS TPSs is over 2,500 UUTs.

The CASS design was initiated in 1986 and production began in 1991. The first production CASS stations will have reached a point where wear and obsolete components (CASS is 85% COTS) will drive untenable ownership costs. The Navy's program to modernize mainframe CASS is named eCASS. About 338 eCASS stations will be procured. The development contract, which was awarded under full and open competition in FY2010, will continue through 2015. The full rate production contract will be awarded in FY2015.

The CASS Program Manager is: Capt Frederic W. Hepler Naval Air Systems Command PMA260 47123 Buse Road, Unit IPT, Suite 349 Patuxent River, MD 20670-1547 Phone: (301) 757-6899; DSN 757-6899 Fax: (301) 757-6902: DSN 757-6902 E-mail: fred.hepler@navy.mil

4.2 Integrated Family of Test Equipment (IFTE)

The Integrated Family of Test Equipment has evolved as the Army's standard ATS for support of all weapon systems. The IFTE family includes Off-Platform ATS (OPATS) and At-Platform ATS (APATS). The OPATS includes the Base Shop Test Station (BSTS) and Base Shop Test Facility (BSTF), the Electronic Repair Shelter (ERS), and the Commercial Equivalent Equipment (CEE). The APATS includes the Maintenance Support Device (MSD)-Version 2 (MSD-V2), and the MSD-V3. IFTE provides a vertically integrated ATS capability for sustainment and field levels of maintenance.

4.2.1 IFTE Off-Platform Testers

The Base Shop Test Station (BSTS) and Base Shop Test Facility (BSTF) were produced beginning in 1989 and the CEE in 1988. The BSTS and CEE procurements, based on weapon system support requirements, support depot sustainment needs. The BSTF, BSTS and CEE have all transitioned to sustainment. The newest OPATS member of the IFTE family will be the BSTF Version 6, commonly known as the Next Generation ATS (NGATS). The NGATS is currently under development to replace the DSESTS, BSTF(V)3, BSTF(4), and BSTF(V)5.

The BSTFs are used for testing weapon system Line Replaceable Units (LRUs) in the field at Direct Support/General Support locations, supporting TPS developers, and fulfilling

training requirements for the soldier. The BSTS provides support to TPS developers and fulfills training requirements for the soldier. The CEE is used for LRU and Shop Replaceable Unit (SRU) TPS development, for depot level maintenance programs, and as factory test equipment.

4.2.2 IFTE At Platform Automatic Test Systems

The initial production contract for IFTE At Platform Automatic Test Systems (APATS) started in the early 90s. Technological refresh of these systems is planned for every five years to keep pace with the rapid advancement of commercial technology. All IFTE APATS are procured with Contractor Logistic Support, maximizing the open architecture using COTS operating systems with added capabilities including wireless communication, Digital Versatile Disc writer, and color sunlight readable display. In addition, each contract has a technology insertion clause to support incremental upgrades. The IFTE APATS program continues to support current and future Army, tri-service, and Foreign Military Sale (FMS) requirements. Also, APATS is the Army's enabler for weapon systems' diagnostics, maintenance management, and condition based maintenance data provided to automated logistics systems such as GCSS-A and the CLOE.

The Army requirement for APATS is over 40,000. Due to the rapid improvement in commercial technology and DoD Information Assurance mandates, the first, second, and third generations of APATS called Contact Test Set (CTS), Soldier's Portable On System Repair Tool (SPORT), and Maintenance Support Device respectively are considered obsolete and are currently being replaced. The fifth generation system, Maintenance Support Device – Version 3 (MSD-V3), is a smaller, more capable replacement at-platform tester. Currently in production, it is scheduled to begin fielding in FY12. The MSD-V3 will be capable of performing the Army's total maintenance mission on-platform, at-platform, and as a detachable walk-around portable maintenance aid as well as a vehicle health management tool installed within each Army platform, as is being implemented with Stryker.

The IFTE MSD is a standard, general-purpose, at-platform tester used at all maintenance levels. The MSD tests and diagnoses complex electronics, engines, transmissions, central tire inflation systems, anti-lock brake systems, among other critical components, in missile, aviation and vehicular weapon systems. Moreover, weapon system maintainers use the MSD to execute Interactive Electronic Technical Manuals (IETM), Electronic Technical Manuals, weapon system specific software applications, upload and download mission planning tools, and troubleshoot weapon systems more efficiently. For vehicular test and diagnostic requirements, an Internal Combustion Engine (ICE) test adapter kit supports the MSD.

The IFTE Program Manager is: Mr. George Mitchell, US Army PD TMDE Attn: SFAE-CSS-JC-TM Bldg. 3651, Rm. PM 1 Redstone Arsenal, AL 35898-5000 Phone: (256) 876-4792; DSN 746-4792 Fax: (256) 955-6361 E-mail: george.mitchell1@us.army.mil

4.3 Versatile Depot Automatic Test System (VDATS)

The Versatile Depot Automatic Test System was designed and developed by the Air Force through a DoD transformation initiative. Initially the project was directed toward the Warner Robins Air Logistics Center's Electronic Technology Repair Center to eliminate aging unsupportable ATS. VDATS later was identified by the ILCM Framework as the standard ATS system for the entire Air Force and adopted by the AMB as a member of the DoD Family of ATS. Air Force Maintenance for the 21st Century is transforming maintenance activities from the flight line to the depot into two integrated networks—a mission generation network and a supporting repair network. Applications for VDATS beyond Air Force depots will be realized through this transformation initiative.

VDATS basic configurations include the DA-1 with 336 hybrid pins, DA-2 with 526 hybrid pins, and RF-1 which is a standard RF roll-up. VDATS basic configurations include both digital and analog instrumentation, a synchro/resolver measurement-simulation instruments, AC and DC power supplies, DC electronic loads, and both Cross-Point Matrix and general-purpose switching.

Overall VDATS is a powerful ATS capable of testing both legacy and advanced technology weapon systems. The Air Force owns all VDATS reprocurement data for both hardware and software. Future sustainment of VDATS will be provided through a performance acquisition contract that will include VDATS build-to-print support and guaranteed parts availability worldwide. VDATS reached IOC in FY08 for 18 operational systems and over 40 additional systems are in work. Today there are over 50 systems in operation with additional procurements in work.

The VDATS Program Manager is: Col. Michael Senseney WRALC/GRN 460 Richard Ray Blvd, Suite 200 Robins AFB, GA 31098-1813 Phone : (478) 222-2100; DSN 472-2100 Fax: (478) 222-2254; DSN 472-2254 E-mail: michael.senseney@robins.af.mil

4.4 Marine Corps Automatic Test Systems (MCATES)

On 21 October 1998 the DoD ATS Executive Agent approved the USMC's Marine Corps Automatic Test Systems (MCATES) as a new DoD ATS Family with the Third Echelon Test Set (TETS), AN/USM-657, being the basic family member within MCATES. The USMC has developed TETS to provide a capability to test, diagnose, and screen a wide variety of electronic and electro-mechanical units at the ground forces organic maintenance levels. TETS also functions as stand-alone General Purpose Electronic Test Equipment (GPETE), allowing the operator maximum usage of all TETS assets. TETS supports testing of analog, hybrid, and digital technologies and includes basic, RF and EO configurations. TETS must be highly mobile so it was designed to be man-portable and operable from vehicle power. The TETS configurations are:

- 1. AN/USM-657 (V)2, RF
- 2. AN/USM-657 (V)3, E/O

The AN/USM-717 family of ATE is intended to complete the original AAO of the AN/USM-657 family. The operational characteristics have been increased in an effort to expand the level of support provided. The upgraded system was renamed the Virtual Instrument Portable Electronic Repair Tester (VIPER/T), AN/USM-717. The AN/USM-717 configurations are:

- 1. AN/USM-717 (V)1, RF/EO
- 2. AN/USM-717 (V)2, RF
- 3. AN/USM-717 (V)3, EO

An additional requirement for an operator/crew and organic level test capability of software defined tactical radios is being addressed by the AN/USM-718 Ground Radio Maintenance Automatic Test System (GRMATS). The GRMATS will allow operator/crew unit to increase readiness on the line by diagnosing equipment at the lowest possible echelon of maintenance.

The MCATES Program Manager is: William D. Johnson PMM-161, PM TMDE Marine Corps Systems Command 2200 Lester Street Quantico, VA 22134 Phone: (703) 432-3235 Fax: (703) 432-3262 E-mail: william.d.johnson2@usmc.mil

4.5 Joint Services Electronic Combat System Tester (JSECST)

The Joint Services Electronic Combat System Tester is an Acquisition Category (ACAT) III flightline end-to end Electronic Countermeasures O level tester capable of verifying system status and fault isolation. Capabilities include threat representative simulations and technique/signal response analysis. JSECST (AN/USM-670) is a Joint USAF-USN program built to work with multiple Navy, USAF, Army and Marine platforms. Since completion of production in March 2005, JSECST hardware and software is being sustained by WR-ALC to support Air Force, Navy, Army and Marine users. The total DoD acquisition quantity includes 121 core test sets for Air Force and 125 for Navy, as well as JSECST core test sets for USMC and Army. Sustainment of hardware is provided through a Joint Performance Based Logistics Contract.

The JSECST (USM-670) Program Manager is: Col. Michael Senseney WR-ALC/GRN 460 Richard Ray Blvd, Suite 200 Robins AFB, GA 31098-1638 Phone: (478) 222-2200; DSN: 472-2200 Fax: (478) 222-2254; DSN 472-2254 E-mail: michael.senseney@robins.af.mil

4.6 Criteria for Adding New ATS Families/New Members

New ATS families may be added to the DoD inventory of ATS families if they meet the following criteria as established by the reference (d) Joint Services Memorandum of Agreement:

1. The tester must be capable of supporting multiple weapon system test requirements and there must be planning in place for implementation as such,

2. The tester must have flexible hardware and software architectures which are expandable and tailorable with minimal impact to existing logistic support profiles and TPSs,

3. The tester must provide a capability to satisfy a Service performance or operational requirement that cannot be accommodated within the existing DoD ATS family structure,

4. The tester must provide a more cost effective/beneficial ATS solution than use or modification of an existing DoD family member, and

5. The tester must be re-procurable and must have a dedicated government management office that has a process in place to ensure that:

- long term tester viability is maintained; and

- the tester will evolve to satisfy future support requirements.

In general, new ATE may be added to an existing DoD ATS family if the following criteria is met:

1. The criteria specified above for designation of new ATS families, and

2. The tester must contain the critical hardware and software elements to ensure TPS interoperability between the proposed ATE and the parent designated ATS family.

4.7 Compliant Non-DoD Standard Family ATS Procurement

New ATS requirements that cannot presently be met by ATS family members can still fit within the guidelines of the DoD ATS policy and be approved for acquisition if they fall into one of the following categories:

1. Modifications to existing inventory ATE that do not involve increasing the UUT test capability of the ATS,

2. TPS reprocurement actions for use with non-family ATS, and

3. Approved ATS policy deviations (see paragraph 5.1).

PMs should use the approach described in reference (e), the DoD ATS Selection Process Guide, to analyze and select ATS solutions for weapon system support requirements. The selection technique presented is summarized in section 5 below and is compliant with the intent of DoD ATS acquisition policy. ATS selection procedures for analyzing prospective ATS requirements with the objective of minimizing the proliferation of unique weapon system ATS are introduced in that document.

5.0 ATS Selection Analysis Process

The DoD ATS Selection Process Guide (reference (e)) promulgates a standardized ATS selection process as an effective method for PMs to select ATS that complies with the research, development, and acquisition objectives established by OUSD(A&T) in references (a), (b) and (c). As shown in Figure 3, this Service-level ATS selection analysis process involves the following steps:

- 1. Identify the weapons system's support/test requirements,
- 2. Define the various support/test alternatives,
- 3. Analyze the alternatives, and
- 4. Select the appropriate ATS support alternative.

The DoD ATS Selection Process Guide provides the procedures to be used by DoD PMs to implement the requirements of references (a), (b) and (c) with regard to ATS selection. It presents the process for preparing requests for deviation from the policy when the selection process yields a non-family ATS solution. PMs may obtain assistance and advice on the processes contained therein from their Service's AMB member and ATS Leadership Office.

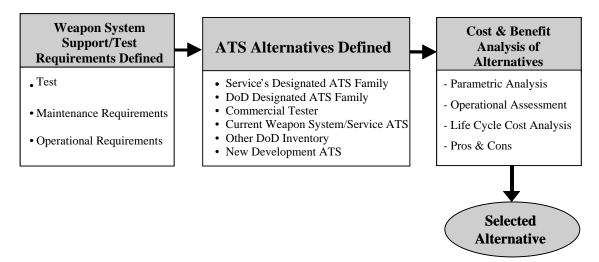


Figure 3: ATS Selection Process

The principal purpose of the process described in the DoD ATS Selection Process Guide is to enable the Services to make an ATS selection for each requirement that fits within the total DoD investment strategy context, i.e., the costs incurred are to be leveraged to the maximum extent possible within a Service and/or across the Joint Services spectrum. The following hierarchy is provided for the selection of ATS consistent with DoD ATS acquisition policy:

- Service's Designated ATS Family
- DoD Designated ATS Family
- Current supportable weapon system/Service ATS (approved Policy Deviation Request is required)
- Commercial tester ATS (approved Policy Deviation Request is required)
- Other DoD inventory ATS (approved Policy Deviation Request is required)
- New development ATS (approved Policy Deviation Request is required)

DoD ATS policy requires that the selection shall be based on a cost and benefit analysis that ensures that the ATS chosen is the most beneficial to the DoD over the system life cycle.

5.1 Policy Deviation Process

ATS Policy Deviation Requests are required prior to any acquisition or modification of ATS in the following cases:

1. Development or procurement of new ATE that is not part of a designated DoD ATS Family,

2. Reprocurement of existing ATE that is not part of a designated ATS Family,

3. Modification of existing ATE that is not part of a designated ATS Family when the modification adds capability to the ATS for testing additional UUTs,

4. Development or procurement of new TPSs for use on ATE that is not part of a designated ATS Family, and

5. Modification or rehost of an existing TPS for use with ATE that is not part of a designated ATS Family when the change/rehost adds significant capability to the ATS for testing additional UUTs.

Any program office with an ATS requirement should always consult with their Service's ATS Leadership Office for assistance with the ATS selection process to identify their proposed ATS solution and determine whether it requires a deviation from the ATS policy. If the selection process culminates in a recommended solution for which a policy deviation would be required, the Service ATS Leadership Office will sponsor the proposed solution to the AMB for its review. If the AMB concurs that the proposed solution and policy deviation request provides the best solution, it will make a recommendation to the appropriate decision authority.

Each Service's ATS Leadership Office has established internal procedures for processing policy deviation requests.

The office submitting each policy deviation request should address the cost, schedule and capability deficiencies of the DoD ATS families, relative to the requirement in question, that would justify a deviation from DoD policy. The primary objective is to ensure that a rational and structured process is used in the evaluation and selection of the recommended ATS. The means

used by the program office in addressing these considerations should be the same analyses used within the program's own execution of the ATS selection process.

If the PM determines there exists an obvious cost, schedule, or performance justification for not using a DoD ATS family member, an abbreviated policy deviation request stating this justification with supporting rationale may be coordinated with the Service ATS Leadership Office and staffed via the same process, but in an expedited manner.

Each policy deviation request will be evaluated by the AMB and the ATS ED from a DoD versus a specific weapon system program perspective. This is to ensure DoD's investment in ATS is leveraged within the Service and/or across DoD components. As part of this evaluation, the AMB will refer to the ATS Acquisition Database maintained by the Services to determine if there are other ATS acquisition initiatives within DoD that have similar technical and operational requirements such that a common solution might be pursued.

ATTACHMENT 1: PRINCIPAL POINTS OF CONTACT

The principal points of contact for the various levels of management in the ATS structure as well as the Services' lead ATS personnel are listed below:

ATS Executive Director

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ATS Executive Directorate

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ATS IPT LEADERS

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