



# **DoD ATS Selection Process Guide 2009**

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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) USAF memorandum of 26 November 2007
- (e) DoD ATS Joint MOA among Service Acquisition Executives of September 2004
- (f) OUSD(A&T) memorandum of 2 February 2004
- (g) ASN(RDA) memorandum of 22 Jun 2004

## Acronyms

ACAT	Acquisition Category
ALO	ATS Leadership Office
AMB	ATS Management Board
ARI	ATS R&D IPT
ASN (RDA)	Assistant Secretary of the Navy (Research, Development and Acquisition)
ATE	Automatic Test Equipment
ATS	Automatic Test System(s)
BSTF	Base Shop Test Facility
CASS	Consolidated Automated Support System
CBA	Cost and Benefit Analysis
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CFA	Cognizant Field Activity
CI	Critical Interface
DAB	Defense Acquisition Board
DFAR	Defense Federal Acquisition Regulations
DISR	Defense Information Technology Standards Registry
EA	Executive Agent
EAO	Executive Agent Office
ED	Executive Directorate
ECP	Engineering Change Proposal
E&MD	Engineering & Manufacturing Development
FAT	First Article Test
GFE	Government Furnished Equipment
IFTE	Integrated Family of Test Equipment
ILS	Integrated Logistics Support
IOC	Initial Operating Capability
IPT	Integrated Product Team
ISE	In-Service Engineering
JTA	Joint Technical Architecture
LCC	Life Cycle Cost
LRU	Line Replaceable Unit
LRFS	Logistics Requirements Funding Summary
MDA	Milestone Decision Authority
MOA	Memorandum of Agreement
NAWCAD LKE	Naval Air Warfare Center Aircraft Division, Lakehurst NJ
OSD	Office of Secretary of Defense
O&S	Operation & Support
PEO	Program Executive Officer
PM	Program Manager
PMA	Program Manager Air
POC	Point of Contact
P&D	Production & Deployment

R&D	Research & Development
ROM	Rough Order of Magnitude
SAE	Service Acquisition Executive
SRA	Shop Replaceable Assembly
SRU	Shop Replaceable Unit
TPS	Test Program Set
UUT	Unit Under Test
WIPT	Weapon System Integrated Program Team
WRA	Weapons Replaceable Assembly

## 1. Purpose

This document provides the procedures and tools needed by the DoD Program Manager (PM) to implement the requirements of references (a) and (b) with regard to the selection of Automatic Test Systems (ATS). It presents the process for preparing requests for deviation to the DoD ATS acquisition policy when the selection process yields a non-Family ATS solution. PMs may obtain assistance and advice on the processes contained herein from their Service's ATS Leadership Office (ALO) member (see Attachment (1)) and should contact the ALO early in the ATS acquisition process.

## 2. Scope

This guide applies to all ATSS acquired within DoD for use at all levels of maintenance and for use at the factory (in either a production role or a support role) when provided as Government Furnished Equipment (GFE).

## 3. Definitions

### **A. Automatic Test System (ATS)**

A fully-integrated, computer-controlled suite of electronic test equipment and instrumentation hardware, software, documentation, and ancillary items designed to verify at any level of maintenance the functionality of Unit Under Test (UUT) assemblies. The term "UUT" includes, but is not limited to, shop replaceable unit (SRUs), line replaceable units (LRUs), shop replaceable assemblies (SRAs), weapons replaceable assemblies (WRAs) circuit cards, aircraft "black boxes", and other removable components from weapons platforms or support systems. An ATS combines the following three elements:

(1) Automatic Test Equipment (ATE). An integrated assembly of stimulus, measurement, and switching components under computer-control that is capable of processing software routines designed specifically to test a particular item or group of items. ATE software includes operating system software, test executive software, and instrument control software.

(2) Test Program Set (TPS). ATE interface hardware and other ancillary equipment that connects the UUT to the ATE, plus test program software specific to the UUT with required documentation. The TPS software directs all test functions including fault isolation and diagnostics, and can certify the condition of a UUT. Ancillary hardware consists of cables, probes, holding fixtures and peculiar instrumentation.

(3) Test Environment. The test environment includes a description of the ATS architecture, programming and test specification languages, compiler, development tools and provisions for capturing and using UUT design requirements and test strategy information in the generation and maintenance of TPS software.

### **B. ATS Family**

An ATS Family consists of ATSs that are interoperable and have the capability to support a variety of weapon system test requirements through common and flexible hardware and software architectures that permit addition or expansion of testing capability with minimal impact to the ATS logistics support profile, system software and TPSs. ATS Families are formally designated as such by OSD.

### **C. ATS Technical Framework**

The framework upon which an open systems architecture for automatic test systems is implemented. It defines key interfaces for an ATS using commonly accepted specifications or standards which may be defined by industry consensus and are utilized by many suppliers. An effective ATS open system architecture relies on physical modularity and functional partitioning of both hardware and software. The result of this approach is the adoption of ATS designs which are easily modified or upgraded without major impact to the unchanged portion of the ATS or its TPSs, and which promote transportability/interoperability of TPSs. The ATS Technical Architecture Framework is published in the Defense Information Technology Standards Registry (DISR).

## **4. Policy Overview**

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 reference (d) 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.

Requests for designation of additional families may be approved provided that the criteria specified in paragraph 4.A of this guide are met.

Points of contact for each of the DoD ATS Families listed above can be found in Attachment (1).

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.

Reference (a) requires the use of a Cost and Benefit Analysis (CBA) to ensure that the ATS chosen is the most beneficial to the DoD, not just a particular program or Service, over the system life cycle.

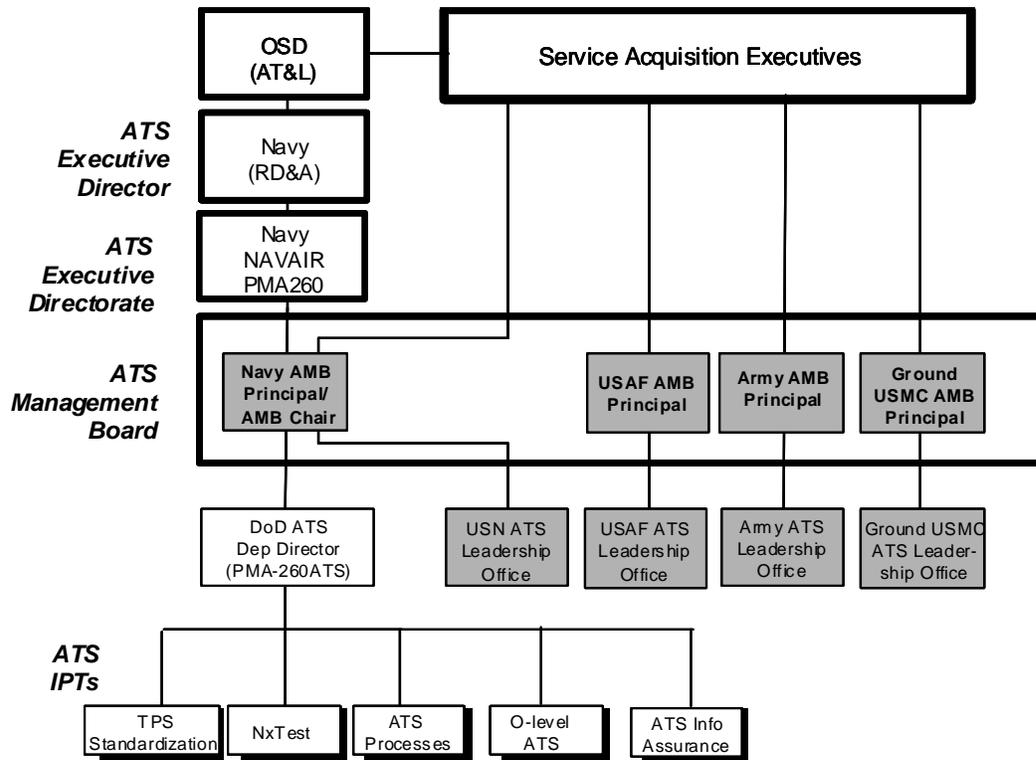
Reference (a) directs that the Service Acquisition Executives (SAEs) jointly agree on processes and procedures to follow in satisfying automatic test systems requirements. In reference (e), the SAEs have agreed to the processes and procedures in this document. As required by the Joint MOA, the ATS ED has established a policy deviation process for those programs that propose not to use the standard DoD ATS families. This document outlines that process.

## **5. ATS Organization**

Reference (f) directs Navy to lead a Joint Service ATS Management Board (AMB) to coordinate Service ATS matters. Reference (g) directs that Navy (Naval Air Systems Command PMA260) serve as the DoD ATS Executive Directorate and perform the functions previously performed as the DoD ATS Executive Agent Office.

The DoD ATS Organization is graphically depicted in Figure 1. Each Service has an ATS Leadership Office (ALO) with oversight of their Service's implementation of the ATS policy. 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/742CBSG) Marine Corps (MARCORSYSCOM (PMM-161, PM-TMDE)), and Navy (NAVAIRSYSCOM, PMA260). Each Service's AMB representative is the Service lead on all DoD ATS matters for that Service. The AMB, chaired by the Director of the ATS ED, provides advice and recommendations to the ATS ED and to Weapon System Program Managers and IPTs (WIPTs). The AMB also reviews ATS policy deviation requests and provides recommendations to the appropriate decision authority. Several IPTs have been established under the 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. Each Service ALO includes subject matter experts in the areas of the selection process itself including preparation of the required CBA.



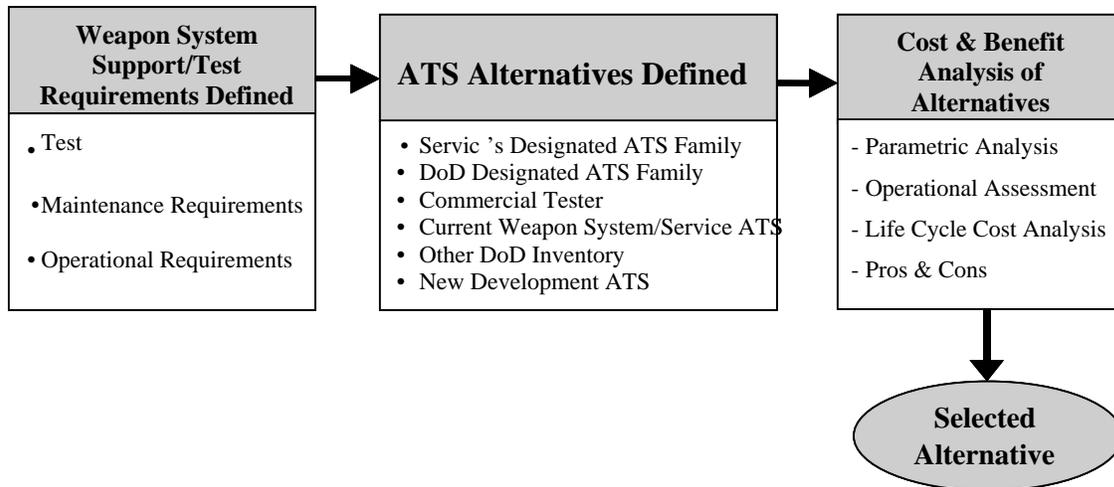
**Figure 1. DoD ATS Organization**

## 6. ATS Master Plan

The ATS Executive Directorate publishes a DoD ATS Master Plan which addresses the implementation of DoD ATS acquisition policy, investment strategy, and modernization strategy. The Master Plan also describes each of the ATS families currently in the DoD inventory and is available at <http://www.acq.osd.mil/ats>.

## 7. ATS Selection Process

When an ATS is required, whether it is during the development or upgrade of a weapon system, replacement due to ATS obsolescence, or modification of an ATS, an appropriate ATS solution must be selected. The process shown in Figure 2 provides a structured approach to ATS selection. This process consists of four primary steps: (1) definition of weapon system support/test requirements, (2) definition of ATS alternatives, (3) cost & benefit analysis of alternatives, and (4) alternative selection.



**Figure 2. ATS Selection Process**

### **A. Requirements Definition**

The selection process begins with an understanding of the weapons system test requirement, i.e., parametric (performance), maintenance and operational test requirements for the targeted units to be tested. Test requirements must be identified early during acquisition planning for new systems and integrated into the support planning for the weapons system. PMs must take responsibility for identifying test requirements and coordinating with the ATS Leadership Office within their Service to ensure requirements are captured.

### **B. Identification of Support Alternatives**

Once the test requirements are thoroughly defined, potential ATS alternatives can be considered. The intent of the policy is the selection of ATS in a DoD context: i.e., DoD's investment in ATS must be leveraged within the Service and/or across the Services. 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

- Commercial tester
- Current weapon system/Service ATS
- Other DoD inventory ATS
- New development ATS

For each non-ATS Family alternative considered, a narrative description of that alternative should be provided that summarizes, as a minimum, the following:

- Test technologies employed
- Unique test capabilities provided not available in DoD designated ATS Families
- Packaging
- Architecture
- Framework compliance
- Intended operating environment
- Other DoD users of the tester
- Logistics support package/plans

### **C. Cost & Benefit Analysis of Alternatives**

The final step of the ATS selection process is an analysis of alternatives to ensure that the ATS chosen is the most cost beneficial to the Service and to DoD over the weapons system's life cycle. The alternatives to be considered by the program office in the trade-off must include the Service's designated ATS Family member, and may include ATS Families from the other Services as appropriate.

The Cost & Benefit Analysis of Alternatives should consist of a parametric analysis comparing weapon system technical specification requirements and tester capabilities, an operational assessment to review any possible operational constraints or requirements on either the weapon system or the ATS under consideration, a life cycle cost analysis, and an assessment of the benefits and shortcomings or "pros and cons" of each alternative. To assist the PM with the cost and benefit analysis of alternatives, the ATS ED has developed and provided guidance in Attachment 2.

## **8. DoD ATS Families**

### **A. Family Evaluation**

The definition of ATS alternatives begins with evaluation of the DoD ATS Families focusing on the Service's designated ATS Family. The ATS Family PMs will provide cost, schedule, and performance information regarding their ATS programs to the Service ALO assisting with the evaluation. The cognizant weapon system/ATS PM is ultimately responsible for the evaluation. However, throughout the ATS selection process, the Service ALO acts as a liaison to the ATS Family PM, assists in the decision making process, and advises the weapon system/ATS PM regarding the documentation for this process. If the information provided by the ATS Family PM reveals an obvious cost, schedule, or performance deficiency with their system, the Service ALO can make recommendations and assist in preparing an abbreviated Policy Deviation Request on this basis. The abbreviated request will follow the same process but may forego the more detailed analysis otherwise required. Additionally, the ATS ED is available for assistance at any step of this process. Any questions regarding this process should be directed to the points of contact provided at Attachment 1.

## **B. Criteria for New DoD ATS Families**

The use of ATS Families is encouraged and is in compliance with the DoD ATS acquisition policy. However, if the analysis yields a non-family solution and the weapon system/ATS PM believes the solution demonstrates characteristics similar to those of an ATS Family, there are provisions for introducing a new ATS Family into the DoD inventory.

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. For a tester to be considered as a new ATS Family the following criteria must be met:

- the tester must be capable of supporting multiple weapon systems
- the tester must have flexible hardware and software architectures that are expandable and tailorable with minimal impact to existing logistic support profiles and TPSs
- the tester must provide a capability that an existing ATS Family does not
- the tester must provide a more cost effective/beneficial ATS solution than use or modification of the applicable existing ATS Family
- the tester must be reprocurable
- the tester must have a dedicated Government management office with a process in place to ensure that long term tester viability is maintained and that the tester will evolve to support future requirements.

Organizations desiring to initiate action to establish a new DoD ATS Family must contact the Service ALO.

## **9. Policy Deviation Process and Flow**

### **A. Deviation Criteria**

A Policy Deviation Request is required prior to the acquisition or modification of any ATS in the following cases:

- development or procurement of a new ATE that is not part of a designated DoD ATS Family,
- re-procurement of an existing ATS that is not part of a designated ATS Family
- modification to an existing ATE that is not part of a designated ATS Family when the modification adds capability to the ATE for testing additional UUTs
- development or procurement of new TPSs for use on ATE that is not part of a designated ATS Family, and
- 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

Table (1) below summarizes the requirements for policy deviation requests.

<b>Situation/Desired ATS Solution</b>	<b>Policy Deviation Request Required?</b>	<b>Decision Authority</b>
DoD-designated ATS Family member	No	N/A
Sustainment effort that does not add capability to the ATS for testing additional UUTs	No	N/A
Non-ATS Family Commercial Tester	Yes	SAE*
Current weapon system/Service ATE	Yes	SAE*
Other DoD inventory ATE	Yes	SAE*
Development of new ATE	Yes	SAE*
Reprocurement of existing ATE that is not part of a designated ATS Family	Yes	SAE*
Modification of existing ATE that is not part of a designated ATS Family when the modification adds capability for testing additional UUTs	Yes	SAE*
Development or procurement of new TPSs for use on ATE that is not part of a designated ATS Family	Yes	SAE*
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 capability to the ATS for testing additional UUTs	Yes	SAE*

*\*For ACAT I programs before milestone C. For other programs, the cognizant milestone decision authority.*

**Table 1. Requirements for Policy Deviation Requests**

**B. Deviation Approval Process Flow**

The process for obtaining approval of an ATS Policy Deviation Request is depicted in figure (3) and described below:

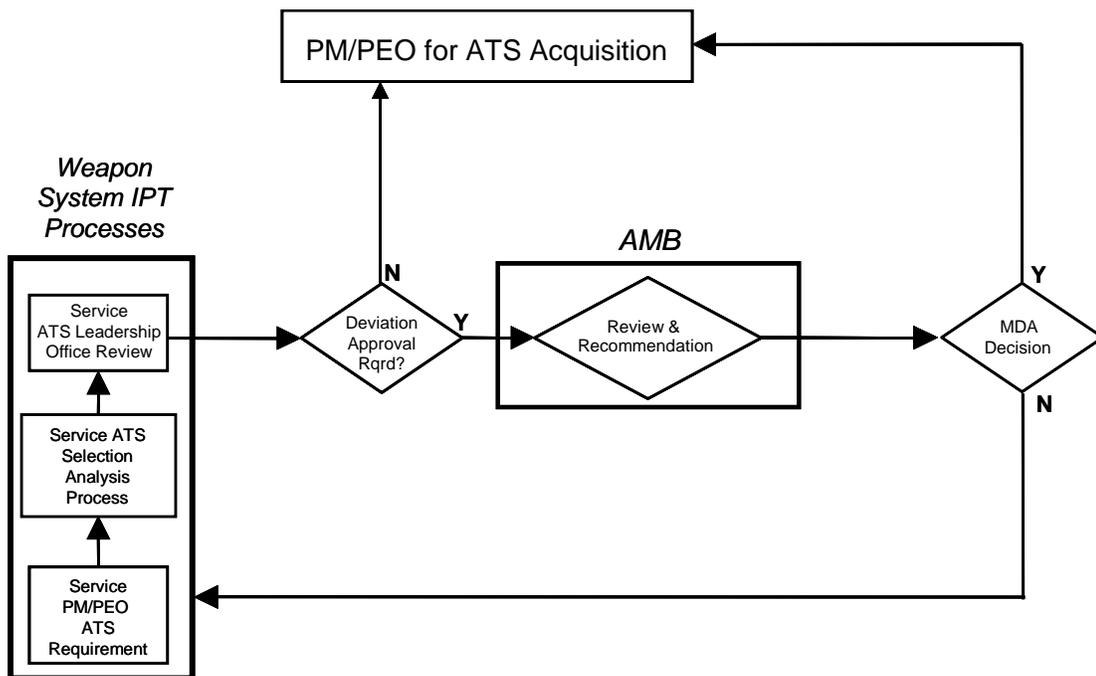
- (1) The Service ALO will provide representation to the weapon system IPT to assist in the ATS selection process, and after complying with any internal Service regulations or procedures, will forward any Policy Deviation Requests recommended for approval to the AMB.

If the analysis reveals an obvious cost, schedule, or performance deficiency with the ATS Families, the Service ATS representative can make recommendations and assist the weapon system/ATS PM in preparing an abbreviated policy deviation request on this basis. Abbreviated requests will follow the same process but may forego the more detailed analysis otherwise required.

- (2) The AMB will review all Policy Deviation Requests from a DoD perspective rather than a program-specific basis for necessity, completeness and accuracy, and the ATS ED will submit a recommendation to the Service PM and MDA.
- (3) If the AMB does not reach agreement, the recommendation to the MDA will state the reasons for the lack of agreement in order to provide the MDA with all relevant decision-making information.

- (4) (a) For ACAT 1 programs before Milestone C, the MDA may:
- (1) recommend approval of the deviation request and forward it to OSD(AT&L) for endorsement to the Defense Acquisition Board (DAB), or
  - (2) disapprove the deviation request, return it to the PM/Program Executive Officer (PEO) for reconsideration.
- (b) For ACAT I weapon systems programs beyond Milestone C and all lesser ACAT programs, the MDA may:
- (1) approve the deviation request and return it to the PM/PEO for acquisition action, or
  - (2) disapprove the deviation request and return it to the PM/PEO for reconsideration.
- (5) The MDA will inform the AMB of the disposition of all deviation requests.

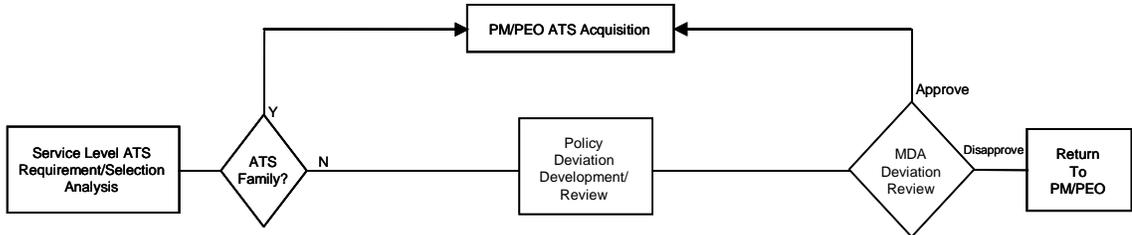
Existing Service waivers for the use of other than approved DoD ATS Families remain in effect. However, Program Managers will plan for bringing legacy ATS systems into compliance with the DoD ATS Technical Framework when it operationally makes sense and/or is cost effective to do so.



**Figure 3. ATS Policy Deviation Process**

### C. Policy Deviation Approval Form

A structured form to process the Policy Deviation Request is provided as Attachment 3 and must be completed before the deviation request begins the approval process. The form provides a means to address the issues related to the selection of the ATS and to provide the results of any analysis that may be required to identify the cost, schedule, parametric, and/or operational deficiencies that led to a decision not to select a DoD ATS Family as a solution. It also provides a means to document approval or disapproval by the appropriate decision authority. A copy of this form can be downloaded from the ATS ED Web Site (<http://www.acq.osd.mil/ats/spg-att4.doc>).



D O D A T S S E L E C T I O N P R O C E S S  R O L E S & R E S P O N S I B I L I T I E S	PM/PEO	<ul style="list-style-type: none"> <li>- Parametric analysis of UUT Requirements vs ATS</li> <li>- Operational Assessment</li> <li>- Maintenance Rqmts</li> </ul>	<ul style="list-style-type: none"> <li>- Develop Cost Benefit Analysis</li> </ul>	<ul style="list-style-type: none"> <li>- Document Parametric Analysis, Operational Assessment, and Maintenance Rqmts</li> </ul>	<ul style="list-style-type: none"> <li>- Develop Deviation Request</li> </ul>	<ul style="list-style-type: none"> <li>- Support Deviation Request</li> <li>- Implement MDA Decision</li> </ul>
	Service ALO	<ul style="list-style-type: none"> <li>- Determine if proposed solution meets policy criteria</li> <li>- Provide input to ATS Master Plan</li> <li>- Conduit for ATS ED data</li> </ul>	<ul style="list-style-type: none"> <li>- Assist PM/PEO in developing policy deviation request</li> </ul>	<ul style="list-style-type: none"> <li>- Review deviation request</li> </ul>	<ul style="list-style-type: none"> <li>- Make preliminary recommendation to AMB</li> </ul>	<ul style="list-style-type: none"> <li>- Track deviation request through the review cycle</li> </ul>
	AMB	<ul style="list-style-type: none"> <li>- Provide guidance to Service AMB Reps</li> <li>- Coordinate tech support of ATS Family</li> </ul>	<ul style="list-style-type: none"> <li>- Provide guidance to Service ALO</li> </ul>	<ul style="list-style-type: none"> <li>- Review Policy Deviation Requests</li> <li>- Review ATS Master Plan for opportunities to leverage investments</li> </ul>	<ul style="list-style-type: none"> <li>- Provide guidance to Service ALO</li> <li>- Provide recommendation to MDA</li> <li>- Review ATS Master Plan for opportunities to leverage investments</li> </ul>	
	ATS ED	<ul style="list-style-type: none"> <li>- Assist Service AMB Reps</li> <li>- Provide additional technical expertise</li> </ul>		<ul style="list-style-type: none"> <li>- Update ATS Master Plan if required</li> </ul>	<ul style="list-style-type: none"> <li>- Track Policy Deviation Requests</li> </ul>	<ul style="list-style-type: none"> <li>- Track deviation through the review cycle</li> </ul>

Figure 4. Roles and Responsibilities in the ATS Selection Process

## **Attachment 1. DoD ATS Selection Process Key Points of Contact**

### **ATS Executive Director**

Mr. Sean J. Stackley  
Assistant Secretary of the Navy (Research, Development and Acquisition)  
Department of the Navy  
Washington, DC 20350-1000  
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Department of the Navy  
Washington, DC 20350-1000  
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### **ATS Executive Directorate**

#### Director, ATS Executive Directorate:

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E-mail: fred.hepler@navy.mil

#### Deputy Director, ATS ED:

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#### Assistant Deputy Director, ATS ED:

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## **DoD ATS Family Points of Contact**

### **CASS**

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Naval Air Systems Command  
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Fax: (301) 757-6902; DSN 757-6902  
E-mail: chris.giggey@navy.mil

### **IFTE**

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PD TMDE  
Attn: SFAE-CSS-JC-TM  
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Redstone Arsenal, AL 35898-5000  
Phone: (256) 876-4792; DSN 746-4792  
Fax: (256) 955-6361; DSN 746-6361  
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### **MCATES**

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Fax: (703) 432-3262; DSN 378-3262  
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### **JSECST**

Barry Clark  
WR-ALC/GRNAA  
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Fax: (478) 222-2254; DSN 472-2254

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**VDATS**

Wendy Johnston  
WRALC/GRN  
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Robins AFB, GA 31098-1813  
Phone (478) 222-2100; DSN 472-2100  
Fax: (478) 222-2254; DSN 472-2254  
E-Mail: [wendy.johnston@robins.af.mil](mailto:wendy.johnston@robins.af.mil)

## **ATS IPT Leaders**

### **Next Generation ATS (NxTest):**

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## Attachment 2. Guide to Conducting a Cost & Benefit Analysis of Alternatives

An ATS Cost & Benefit Analysis of Alternatives should consist of the following: (1) a parametric analysis, (2) an operational assessment, (3) a life cycle cost analysis, & (4) a “pros and cons” assessment to highlight any additional benefits and/or shortcomings of each alternative.

### (1) Parametric Analysis

As part of the ATS selection process, an objective, analytical comparison of Unit Under Test (UUT) parametric test requirements versus the test capability of candidate testers must be performed. The analyses must identify UUT test requirements that the candidate testers cannot meet, the cost to add the delta to a standard tester, and discuss how the test capability will be provided (new or reuse ancillary items, active interface devices, etc).

For each UUT, data should be collected for all applicable test categories by technical/engineering personnel familiar with the design and operation of the weapon system UUTs.

While it is recognized that the collection of UUT test requirement data can be the most time-consuming and difficult part of the process, the collection of the most complete and accurate data available is essential to obtain useful and valid results. It is also recognized that the level of parametric data available for a given weapon system or set of UUTs is directly dependent on its life cycle phase. For each specific program phase of the weapon system’s acquisition, the following guidance is provided for collecting test requirement data:

- Technology Development Phase: During the pre-Milestone B phase, parametric test requirement data will typically consist of the parametric data envelope of the weapon system as a whole. ATS analysis at this time may even be limited to identifying any unique operational or environmental ATS requirements need to support the system (man-portable, for example).
- System Development & Demonstration (SD&D) Phase: During the Pre-Milestone C SD&D phase, parametric test requirement data should be available for each WRA/LRU and SRA/SRU. This parametric test requirement data can be found in the contractual specification for each WRA/LRU and SRA/SRU at the time of the Critical Design Review (CDR).
- Production & Deployment (P&D) Phase: During the post-Milestone C P&D phase, parametric test requirement data should be available for each WRA/LRU and SRA/SRU. This parametric test requirement data should be based on actual parametric data for each WRA/LRU and SRA/SRU at the time of the First Article Test (FAT).
- Operations & Support (O&S) Phase: During the O&S phase, parametric test requirement data should be available for each WRA/LRU and SRA/SRU. This parametric test requirement data should be based on actual parametric data for each fielded WRA/LRU and SRA/SRU.

The UUT test requirement data is next compared to the test capabilities for the ATS Family members under consideration. The analysis should include an assessment of the limitations of a target ATE station to fully support a UUT without Interface Device (ID)/Interface Test Adapter (ITA) or Test Program Set intervention. Evaluation of these limitations should be performed by engineering or technical personnel familiar with the weapon system UUTs and/or the target ATS platforms. The evaluation of limitations assists in comparing suitability of various ATE platforms to support a weapon system's test requirements. The DoD ATS ED has made the System Synthesis Models (SSM+) tool available to assist program managers in performing the parametric comparison of UUT test requirements to ATS test capabilities. Points of contact for the SSM+ tool are provided in Attachment 1.

For each alternative considered, the Cost & Benefit Analysis of Alternatives should summarize the results of the parametric analysis and provide a technical assessment of each of the candidate testers' ability to provide overall support to a weapon system & highlight any shortfalls of a given alternative to satisfy any weapon system test requirements. If all alternatives under consideration provide the required test capability to provide overall support to the weapon system, (i.e. - - program office is not seeking a waiver or deviation because of insufficient test capabilities within the existing DoD ATS Families), Cost & Benefit Analysis of Alternatives can simply state that all alternatives provide sufficient test capability to support the weapon system.

## **(2) Operational Assessment**

Operational constraints must be evaluated in conjunction with the UUT test requirements. Operational requirements such as transportability (e.g., man-portable), environmental (e.g., excessive temperature, EMI or humidity), or deployability (e.g., rapidity of deployment) of the candidate ATE may be factors in the determination of an effective ATS solution. For each alternative considered, the Cost & Benefit Analysis of Alternatives should summarize how each of the candidate testers meets or does not meet the operation requirements that must be satisfied to provide overall support to a weapon system in its intended environment & highlight any shortfalls of a given alternative to satisfy any operational requirements. If all alternatives under consideration satisfy the operational requirement (i.e., the program office is not seeking a waiver or deviation because none of the existing DoD ATS Families can perform within the intended operational environment), Cost & Benefit Analysis of Alternatives can simply state that all alternatives will perform within the intended operational environment.

### (3) Life Cycle Cost Analysis

A Life Cycle Cost Analysis must be prepared to capture all ATS non-recurring investment and recurring sustaining costs over the life cycle. The life cycle cost analysis should be provided in Excel format and as a minimum address the following cost categories:

NON-RECURRING INVESTMENT COSTS	RECURRING SUSTAINING COSTS
1.1 ATE Development	2.1 Manpower
1.2 ATE Production	2.2 Sustaining Training
1.3 TPS Development	2.3 ATE Support/Maintenance
1.4 TPS Production	2.4 ATE In-Service Engineering
1.5 Initial Training	
1.6 Interim Support	
1.7 Initial ATE Support/Maintenance	

To ensure that the cost estimating methodology applied is consistent across all ATS alternatives, substantiating documentation to support all assumptions, sources of information, basis of estimates and calculations must be maintained and available upon request. Life Cycle Cost Analyses may be performed using present or then-year dollars as long as a consistent methodology is applied across all alternatives. The quality and completeness of costing information will be used as an indicator of the validity of the cost analysis. Definitions for each cost category that must be considered as well as acceptable cost estimating methodologies for each cost category are provided as follows:

#### 1.0 Non-Recurring Investment Costs:

Investment costs include those costs associated with the development and acquisition of all required ATE and TPSs, initial ATE operator/maintainer training, interim weapon system support, and the acquisition of all required ATE support/maintenance equipment. Any costs associated with extending the service life of the ATE and/or TPSs for their intended life cycle, i.e., the service life of the weapon system(s) supported are also included.

#### 1.1 ATE Development Costs:

Definition: ATE development costs include all costs associated with the development and testing of the ATE, including non-recurring engineering, ILS, technical data, and documentation. Any future investments required to upgrade or sustain ATE should also be considered. Unique modifications required to provide additional capability to support the candidate weapon system(s) testing requirements on the DoD ATS Families should be reflected in the costs of Test Program Sets (TPSs). For DoD ATS Families, the development cost is considered sunk.

Acceptable estimating methodologies: Formal contractor cost proposal, escalated historical buys of similar equipment, parametric hardware/software models, or engineering cost estimates.

#### 1.2 ATE Production Costs:

Definition: ATE production costs include all recurring costs to satisfy the inventory objective. For DoD ATS Families, only a fair share of this cost, based upon the workload required to support the weapon system(s) at the scheduled sites, should be reflected.

Acceptable estimating methodologies: Actual contract costs, formal contractor cost proposal, escalated historical buys, parametric hardware/software models, or engineering cost estimates. For DoD ATS Families, the latest ATE production costs can be obtained from the appropriate Program Office.

### **1.3 TPS Development Costs:**

Definition: All costs associated with the development and testing of TPSs including ILS, technical data, and documentation are included under TPS Development Costs. Any costs associated with modifying these TPSs to accommodate future ATE modifications should also be considered.

Acceptable estimating methodologies: Actual contract costs, formal contractor proposal, escalated historical buys, or TPS Cost Model. The Navy has developed a Standard TPS Cost Management System (STCM) to provide a standard methodology for TPS cost estimation across all ATE platforms. The NADEP Jacksonville Rough Order of Magnitude (ROM) Model is also available for developing CASS TPS Cost Estimates. Assistance in generating TPS development costs for DoD ATS Family testers may be obtained from the appropriate Program Office. The office preparing the cost analysis must show that equivalent TPS development tasks are considered across each ATE platform to ensure consistency among TPS cost estimates.

Note: TPS development and production costs should be equivalent across ATE platforms with similar test capabilities and may be considered a “wash”. When shortfalls exist with a tester platform to fully support a UUT, the costs to provide additional test capability can be captured as either a TPS or ATE Development/Production cost. For DoD ATS Family members, these costs should be determined with assistance from the technical POC for the ATS Family member.

### **1.4 TPS Production Costs:**

Definition: TPS production costs include all recurring costs to meet the TPS inventory objective.

Acceptable estimating methodologies: See 1.3 TPS Development Costs.

### **1.5 Initial Training:**

Definition: Initial training includes all non-recurring costs associated with establishing training schools/courses and initial field-level ATE operator/maintainer personnel training. For DoD ATS Families, the cost to develop training courses is considered sunk. Any costs associated with TPS developer training should be included and separately itemized in 1.3 TPS Development Costs.

Acceptable estimating methodologies: Formal contractor proposal, escalated historical training cost data, or logistics estimates. For DoD ATS Families, the latest ATE training costs can be obtained from the appropriate Program Office.

## **1.6 Interim Support Costs:**

Definition: Interim support costs are those costs associated with supporting the weapons system until TPSs are available. Assuming TPSs can be made available at the same time for all ATS alternatives, this cost should be considered a “wash”. Where selection of one ATS alternative results in a delay in providing ATS support to the weapons system, the delta cost to provide interim support should be identified.

Acceptable estimating methodologies: Formal contractor proposal, escalated historical logistics cost data, or logistics estimates.

## **1.7 Initial ATE Support/Maintenance Costs:**

Definition: Initial ATE support/maintenance costs include all non-recurring and recurring costs associated with procuring initial support capability for the ATE itself (support of support equipment, spares, depot repair capability and software support, for example). A description should be provided of the ATE's maintenance plan with support equipment requirements itemized. Initial ATE support/maintenance requirements should be driven by the planned ATE maintenance philosophy. Costs to be considered under various ATE maintenance philosophies are as follows:

- Contractor ATE Support – Initial maintenance/calibration contract and spares pool investment.
- Organic ATE Support – Calibration standards, support equipment, provisioning spares investment, and special tools/fixtures. For DoD ATS families, only the incremental costs associated with providing this capability at new/existing sites should be considered.

To ensure consistency among LCC analyses, the same ATE maintenance philosophy should be considered for all ATE alternatives.

Acceptable estimating methodologies: ATE's Logistics Requirement Funding Summary or other logistics funding information document, formal contractor proposal, escalated historical logistic cost data, or logistics estimates. For DoD ATS Families, the latest Initial ATE support/maintenance costs can be obtained from the appropriate Program Office.

## **2.0 Recurring Sustaining Costs:**

Sustaining costs include all costs associated with operating and maintaining the ATS over its intended life cycle. These costs should be priced annually across the life of the ATE which is typically assumed to be 20 years.

## **2.1 Manpower:**

Definition: Manpower consists of the annual cost of ATE operator and maintainer personnel over the life cycle. Assuming that the DoD ATS Family tester and the proposed ATE have sufficient test capability, comparable test times can be expected. The weapon system failure rate will not vary between different ATE. Consequently, operator cost should be equivalent across alternatives and may be considered a “wash”. Maintainer and technician support costs should be driven by the ATE maintenance philosophy under consideration. ATE maintenance personnel costs are expected to decrease at sites where ATE is already in place to support another program.

Acceptable estimating methodologies: ATE's Logistics Requirement Funding Summary or other logistics funding information document. For DoD ATS Families, the latest ATE manpower requirements can be obtained from the appropriate Program Office.

## **2.2 Sustaining Training:**

Definition: This cost includes sustained training of operators, maintainers, and technicians over the life cycle. For ATE operated and maintained by military personnel, this is usually 1/3 of initial training, reflecting a tour length of three years. Due to lower turnover rates, these costs are expected to decrease when civilian personnel are utilized.

Acceptable estimating methodologies: ATE's Logistics Requirement Funding Summary or other logistics funding information document.

## **2.3 ATE Support/Maintenance:**

Definition: The annual cost of intermediate and depot level maintenance repair and calibration actions on the ATE. If the ATE will be supported through a maintenance contract with the ATE prime contractor, then back-up documentation should be provided to show what is included in the contractor support package and the expected operational availability. In order to select the most cost beneficial alternative, the Program Manager's office performing the ATS selection should evaluate all feasible support maintenance philosophies for the alternatives being considered in the CBA.

Acceptable estimating methodologies: ATE's Logistics Requirement Funding Summary or other logistics funding information document. For DoD ATS Families, the projected annual ATE Support/Maintenance costs can be determined with assistance from the appropriate Program Office based on the planned ATE support philosophy.

## **2.4 ATE In-Service Engineering (ISE):**

Definition: ATE ISE includes all annual recurring costs incurred for the government or a contractor to provide sustaining engineering (e.g., resolving engineering investigations and parts obsolescence issues) and logistics (e.g., maintaining technical manuals) support. This cost category should include the costs of establishing and operating a Cognizant Field Activity

(CFA), or similar engineering/logistics ISE activity, for the ATE as well as any annual software licensing fees. This cost category is considered sunk for DoD ATS Family testers because ISEs are established and annual operating costs will not vary with the number of stations and/or sites.

Acceptable estimating methodologies: ATE's Logistics Requirement Funding Summary or other logistics funding information document.

#### **(4) “Pros and Cons” Assessment**

Finally, a “Pros and Cons” assessment should be provided to highlight any benefits and/or shortcomings of each alternative not already captured as part of the parametric assessment, operational assessment, or life cycle cost analysis. Factors considered in the “Pros and Cons” assessment may include but should not be limited to the following:

- Ease of Use (the extent to which the ATS facilitates the operator’s ability to use the system)
- TPS Transportability (the ability to rehost an existing Test program Set on a DoD Standard ATE)
- Upgradeability or the ability of a test system to be improved incrementally through software and or hardware additions to expand support capability or performance
- Age of Alternative ATS
- Vertical Commonality (the extent to which the ATE will be used to support the weapon system at field, depot, and factory levels such that the non-recurring investment in the ATS can be minimized)
- Horizontal Commonality (the extent to which the ATE is used by other weapon systems either within a Service or DoD)
- Ease of TPS Development (the extent to which the engineering effort associated with TPS development is facilitated)
- Adaptability (the ability of a test set to be reconfigured to test a UUT not previously tested on that system)

### Attachment 3. DoD ATS Policy Deviation Approval Form

From: Program Manager, \_\_\_\_\_  
To: Service Milestone Decision Authority  
Via: Service ATS Management Board Representative  
DoD ATS Management Board

Title: ATS Recommendation for \_\_\_\_\_  
[State the weapon system(s) requiring support]

Background: [State the support requirement in terms of parametric, operational and maintenance level requirements, the ACAT level and milestone phase of the weapon system, and the program status of the proposed Non-Standard ATS alternative]

Alternatives Considered: [State the ATS options considered in the analysis]

Problem/Issue: [Present the cost, schedule, and/or parametric/operational deficiency in capabilities as justification for not using a DoD ATS Family as the support solution]

Discussion: [Provide any additional supporting background, rationale, or justification]

Recommendation:

Back-Up Information: (as required)

- (1) Parametric Analysis
- (2) Operational Assessment
- (3) Life Cycle Cost Analysis
- (4) Summary of Pros and Cons
- (5) Any Additional Substantiating Data

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Approved

Disapproved

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*Service Milestone Decision Authority*