



Mission Based T&E

NDIA 26th T&E Conference
4 March 10

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Purpose

To provide a refresher of the MBT&E methodology.

- To show how ATEC is moving forward with implementation of the methodology.
- To provide observations and lessons learned over the past year.



Agenda

- What is MBT&E?
- Where is MBT&E taking us?
- How are we getting there?
- What have we learned so far?



Overview – What is MBT&E?

Mission-Based Test and Evaluation

is a methodology that focuses T&E on the **capabilities** provided to the war fighter. It provides a <u>framework</u> and <u>procedure</u> to:

- link capabilities to the attributes of the materiel systemof-systems;
- develop evaluation measures that assess capabilities and attributes;
- and link the evaluation measures to all available data sources.



Building Block - What is MBT&E?

Capability¹ – The ability to achieve a **desired effect** [or result, outcome, or consequence of a task²] ...

- under specified standards and conditions
- through a combination of means and ways
- to perform a set of tasks.

Means

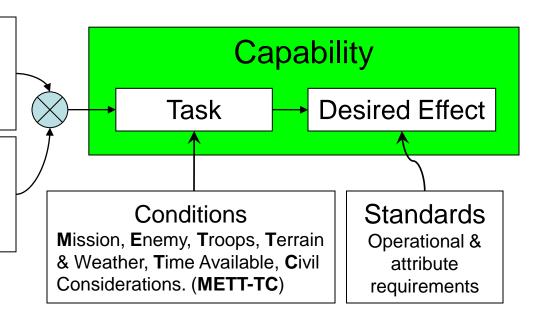
Organization (forces, units), Training, Materiel (equipment functions & resources), Personnel and Facilities.

Ways

Doctrine (tactics, techniques and procedures), Leadership and Education, competencies, concepts and policies.

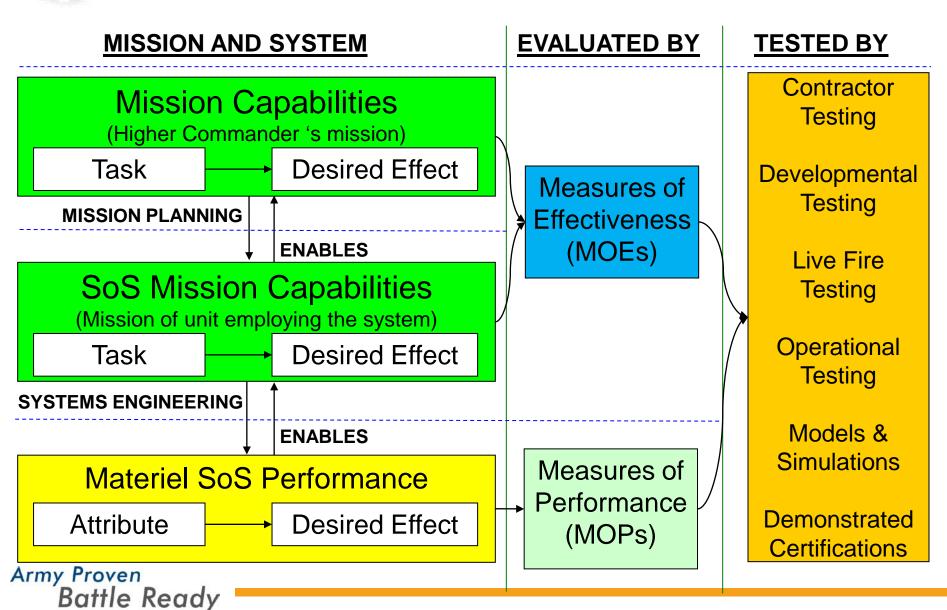
- 1. CJCSI 3170.01F, May 2007
- 2. Taken from JP 1-02, Mar 2007, definition of effect.







Framework – What is MBT&E?



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Process – What is MBT&E?

Step-by-step process and "implementation guide" have been developed.

UNDERSTAND THE MISSION	Mission context, task and conditions.
UNDERSTAND THE SYSTEM	Materiel components and attributes.
	 Linkages between mission and materiel.
DESIGN THE TEST AND EVALUATION	Test design and evaluation measures.
DETERMINE THE RESULTS	Execute test and evaluation.
REPORT THE RESULTS	Format and report the results.
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Recent Guidance – Azimuth Check

DOT&E, Subject: Reporting of OT&E Results, 6 January 2010.



OFFICE OF THE SECRETARY OF DEFENSE

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MEMORANDUM FOR THE COMMANDER, U.S. ARMY TEST AND EVALUATION COMMAND COMMANDER, OPERATIONAL TEST AND EVALUATION FORCE COMMANDER, AIR FORCE OPERATIONAL TEST AND EVALUATION CENTER DIRECTOR, MARINE CORPS TEST AND EVALUATION ACTIVITY COMMANDER, JOINT INTEROPERABILITY TEST

COMMAND SUBJECT: Reporting of Operational Test and Evaluation (OT&E) Results

The statutory responsibilities of the Director, Operational Test and Evaluation, include prescribing policies and procedures for the conduct of operational test and evaluation in the Department of Defense. Currently, DoDI 5000.02 (December 8, 2008) specifies the following:

> OT&E shall be used to determine the operational effectiveness and suitability of a system under realistic operational conditions, including joint combat operations; determine if thresholds in the approved CPD [Capability Production Document] and critical operational issues have been satisfied; assess impacts to combat operations; and provide additional information on the system's operational capabilities.

I have observed differences in evaluating and reporting operational effectiveness and suitability among the operational test authorities that indicate the multiple purposes of OT&E contained in this definition may be causing confusion. Accordingly, the purpose of this memorandum is to clarify the policy for evaluating and reporting operational effectiveness and suitability

The primary purpose of initial OT&E is contained in the first clause quoted above: to determine operational effectiveness and suitability. The context of the determination is discussed clearly in the manual for the Joint Capabilities Integration and Development System (JCIDS). In that manual, operational effectiveness is defined as follows:





MOEs

Measure of mission accomplishment.

MOPs

Measure of system performance.

MBT&E Evaluation Construct

- · Capabilities and limitations presented at the mission level.
- Can be aggregated into ESS. Effectiveness = execution & conditional tasks. Suitability = enabling tasks & characteristics.
- · Mission capabilities and limitations based on execution of ALL tasks necessary to accomplish the mission.
- COI/Cs addressed through evaluation of tasks. - COIs are a sub-set of tasks or system
- · MOEs are a measure of task accomplishment.
- Always operational in nature.

function/characteristics.

- Truer to DAU definition of a MOE; "Measure designed to correspond to accomplishment of mission objectives and achievement of desired results."
- · MOPs are a measure of system performance. - Always technical in nature.
- Truer to DAU definition of a MOP; "Measure of a systems performance expressed as speed, payload, range, time on station, frequency, or other distinctly quantifiable performance features."

Mission

Level 1 Task

MOE

System & Function/ Characteristic

MOP

Level 2 Task







Where is it taking us?

- ATEC is using the MBT&E methodology to:
 - Fully addresses recent acquisition initiatives.
 - Result: The "strengths and weaknesses of a system and its components, and the effect on operational capabilities and limitations" are identified.
 - Result: T&E supports the "collaborative planning and collaborative execution of test phases and events to provide shared data".²
 - Create integrated, robust, and efficient T&E strategies.
 - Result: Mission and system drive evaluated operational capabilities, which drives evaluation requirements, which drives test requirements.

^{2.} Taken from OSD Memo, SUBJECT: Definition of Integrated Testing.



Getting There – Strategy Development

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- The T&E Strategy...
 - Initial strategy development using MBT&E derived template;
 - Links the attributes of the system to mission context; and
 - Addresses Critical Operational Issues, Key Performance Parameters in the mission context.

Mission context driven from evaluation strategy through DT and OT.

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MRAP-ATV T&E Strategy

Developmental Test M-ATV Mission **DT Element** Mobility, HFE, Environmental, Durability, Interoperability, Live Fire Security Mobility, HFE, Environmental, Durability, Interoperability, Live Fire Mounted Patrols Convoy Protection Mobility, HFE, Environmental, Durability, Interoperability, Live Fire Reconnaissance Mobility, HFE, Environmental, Durability, Interoperability, Live Fire Command and Control Transportability, Mobility, HFE, Environmental, Interoperability CASEVAC Mobility, HFE, Environmental Data Interchange HFE, Environmental, Interoperability Transportability, HFE, Durability, Environmental Maintenance Support Transportation Support Transportability, Mobility, HFE, Environmental Sustainment Support Transportability, HFE, Durability, Environmental **Operational Test** ATEL Test Event Design IOTE consists of Operational Mission Profiles (OMPs) and Special Test Events (STEs): · Each OMP will be conducted during day and night: - 6 x OMPs: Route Recon (2 x Missions) · Route Security (3 x Missions) Security · Combat Logistics Patrol (2 x Missions) Mounted Patrols Convoy Protection · Raid (2 x Missions) Reconnaissance · Cordon and Search (3 x Missions) Command and Control Key Leader Engagement (2 x Missions) Casualty Evacuation Data Interchange · Fording/Urban Mobility/Visibility/CBRNE · Drivers Vision Enhancement(DVE)/Night Vision Devices (NVD) · Weapons Live Fire



Getting There - Planning

2 The T&E Plan...

- Focuses on soldier missions and tasks;
- Links the attributes of the system to mission context; and
- Addresses Critical Operational Issues, Key Performance Parameters in the mission context.

Mission and task capabilities are the highest level of the T&E dendritic.

Mobile Tower System Evaluation Plan

CHAPTER 3. EVALUATION DETAILS
3.1 EFFECTIVENESS
3.1.1 MEA 1 Night Vision Device Compatibility
3.1.2 Mission Task 2 Install the MOTS
3.1.2.2 Task 2.2 Setup and Tear Down.
3.1.2.3 Task 2.3. Conduct Minimum Initial Operations
3.1.3 Task 3. Conduct Tower Operations
3.1.3.1 Mission Task 3.1 Retrieve Recorded Communications
3.1.3.2 Task 3.2 Operate Airfield Lighting System
3.1.3.3 Task 3.3. Obtain Airspace Information and Send Messages Via TAIS
3.1.3.4 Task 3.4 Control Aircraft, Vehicles, and Personnel by ATC Light Gun
Signals
3.1.3.5 Mission Task 3.5 Communicate Using RF and Landline
3.1.3.6 Task 3.6 Provide Local Wind Speed/Direction/Altimeter Setting
3.2 SUITABILITY
3.2.1 MEA 2 Training and Training Devices
3.2.2 MEA 3 Reliability, Availability, and Maintainability.
3.2.3 MEA 4 Integrated Logistics Support (ILS)
3.2.4 MEA 6 System Safety
3.2.5 Task 1 Transport the MOTS.
3.2.6 Task 4 Maintain the MOTS.
3.2.7 Mission Task 5 Train.
3.3 SURVIVABILITY
3.3.1 MEA 5 System Survivability
3.3.1.1 MEA 5.1 Electromagnetic Environmental Effects
3.3.1.2 MEA 5.2 Information Security
3.3.1.3 MEA 5.3 Chemical, Biological, Radiological, and Nuclear Effects





Getting There - Reporting

3 The T&E Report...

- Provides conclusions focused on solder missions and tasks;
- Provides conclusions on how the system supported the mission; and
- COIs and KPPs addressed in the context of the soldier's mission and tasks.

All T&E results are related to the mission and task.

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Skid Steer Loader OTA Evaluation Report

CHAPTER 1. INTRODUCTION	1-1
1.1 PURPOSE OF TEST AND EVALUATION.	1-1
1.2 BACKGROUND	
1.2.1 Mission Need	
1.2.2 Existing Capabilities	
1.2.3 System Description	
1.3 SCOPE OF EVALUATION	
1.3.1 Evaluation Issues	
1.3.2 Data Sources	
1.4 KEY MILESTONES	
1.4 KLT MILLSTORES	1
CHAPTER 2. CONCLUSIONS	2_1
2.1 EVALUATION OF DESIRED OPERATIONAL END-STATE.	2 1
2.2 MISSIONS	
2.3 EFFECTIVENESS.	
2.3.1 ART 1.6.2.1. Construct and Maintain Combat Roads and Trails.	
2.3.2 ART 1.7.2. Construct, Emplace, or Detonate Obstacles.	
2.3.3 ART 4.1.7.1. Restore Damaged Areas	
2.3.4 ART 4.1.7.2. Construct and Maintain Sustainment Lines of Communications	
2.3.5 ART 4.1.7.2. Construct and Maintain Sustainment Lines of Communications 2.3.5 ART 4.1.7.3. Provide Engineer Construction Support	
2.3.6 ART 4.1.7.5. Provide Engineer Construction Support. 2.3.6 ART 4.1.7.5. Provide Facilities Engineer Support	
2.3.7 ART 6.7.1.1. Protect Individuals and Systems.	
2.3.8 ART 6.7.1.2. Prepare Fighting Positions.	
2.3.9 ART 6.7.1.3. Prepare Protective Positions.	
2.3.10 ART 6.7.1.4. Employ Protective Equipment	
2.4 SUITABILITY	
2.4.1 ART 4.1.1.1. Perform PMCS.	
2.4.2 ART 4.1.1.6. Repair Equipment.	
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2.7.1 Lack of an Operational Test.	
2.7.2 Special Tools.	
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CHAPTER 3. RECOMMENDATIONS	
3.1 IMPROVEMENT TO THE SYSTEM	
3.2 MODIFICATIONS TO TEST AND EVALUATION STRATEGY	
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Planning - What have we learned?

- MBT&E strategies provide operational capability.
 - T&E IPT linking all T&E requirements to the missions and tasks.
 - Task context flowed into T&E requirements.
 - Leveling of expectations between materiel developer, combat developer and independent T&E
- Task context enhancing T&E design.
 - Evaluation measure design focused on operational context.
 - DT designed using operational techniques and procedures.
 - OT designed to support evaluation of tasks and COI/Cs.

Better integration of DT/OT in direct support of the evaluation.





Reporting - What have we learned?

- Linkages developed in planning support:
 - Understanding of how system technical performance impacted desired capabilities.
 - Integration of individual test results into "accumulated" evaluation of effectiveness, suitability and survivability.
- Conclusions more than a restatement of test results.
 - MBT&E Capabilities = task + desired result.
 - Conclusions telling "what the data means" in terms of capabilities.

Can answer the "so what" question in the war fighter's terms





Summary Observations

Mission context driven from evaluation strategy through DT and OT.

Mission and task capabilities are the highest level of the T&E dendritic.

All T&E results are related to the mission and task.

Better integration of DT/OT in direct support of the evaluation.

Can answer the "so what" question in the war fighter's terms

BOTTOM LINE: We are producing the desired results of:

The "strengths and weaknesses of a system and its components, and the effect on operational capabilities and limitations" are identified.

T&E supports the "collaborative planning and collaborative execution of test phases and events to provide shared data".

Mission and system drive evaluated operational capabilities, which drives evaluation requirements, which drives test requirements.

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