Mission Based T&E

NDIA 26th T&E Conference

4 March 10
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 framework and procedure to:

– link capabilities to the attributes of the materiel system-of-systems;

– develop evaluation measures that assess capabilities and attributes;

– and link the evaluation measures to all available data sources.
Capability\(^1\) – The ability to achieve a **desired effect** [or result, outcome, or consequence of a task\(^2\)] …

- 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.

**Capability**

- **Task**
- **Desired Effect**

**Conditions**
Mission, Enemy, Troops, Terrain & Weather, Time Available, Civil Considerations. (**METT-TC**)

**Standards**
Operational & attribute requirements

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1. CJCSI 3170.01F, May 2007
2. Taken from JP 1-02, Mar 2007, definition of effect.
Framework – What is MBT&E?

**MISSION AND SYSTEM**

**Mission Capabilities**  
(Higher Commander’s mission)

- **Task** → Desired Effect

**SoS Mission Capabilities**  
(Mission of unit employing the system)

- **Task** → Desired Effect

**Materiel SoS Performance**

- Attribute → Desired Effect

**EVALUATED BY**

- Measures of Effectiveness (MOEs)

**TESTED BY**

- Contractor Testing
- Developmental Testing
- Live Fire Testing
- Operational Testing
- Models & Simulations
- Demonstrated Certifications

**MISSION PLANNING**

- Enables

**SYSTEMS ENGINEERING**

- Enables

**Army Proven**

**Battle Ready**
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.
Recent Guidance – Azimuth Check

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

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.
- COIs addressed through evaluation of tasks.
  - COIs are a sub-set of tasks or system function/characteristics.
- MOEs are a measure of task accomplishment.
  - Always operational in nature.
  - 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.”

Aligned
Where is it taking us?

- ATEC is using the MBT&E methodology to:
  - Fully addresses recent acquisition initiatives.
  - Create integrated, robust, and efficient T&E strategies.

Result: The “strengths and weaknesses of a system and its components, and the effect on operational capabilities and limitations”\(^1\) are identified.

Result: T&E supports the “collaborative planning and collaborative execution of test phases and events to provide shared data”\(^2\).

1. Taken from Section 231 report.
2. Taken from OSD Memo, SUBJECT: Definition of Integrated Testing.

Result: Mission and system drive evaluated operational capabilities, which drives evaluation requirements, which drives test requirements.
Getting There – Strategy Development

1 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.
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.
The T&E Report…

- Provides conclusions focused on soldier 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.
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

**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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