



# Mission Based T&E

NDIA 26<sup>th</sup> 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

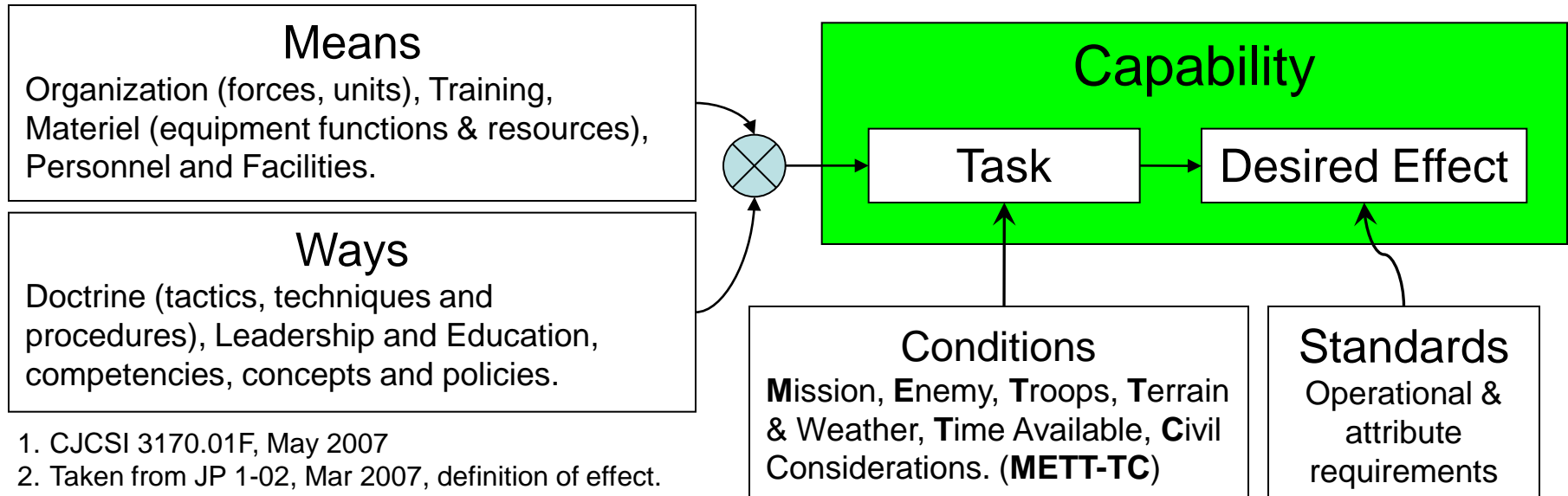
is a methodology that focuses T&E on the **capabilities** provided to the war fighter. It provides a framework and procedure to:

- **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**.

# Building Block - What is MBT&E?

Capability<sup>1</sup> – The ability to achieve a **desired effect** [or result, outcome, or consequence of a task<sup>2</sup>] ...

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



1. CJCSI 3170.01F, May 2007

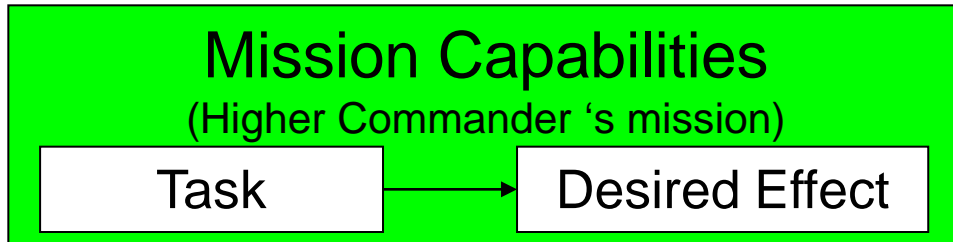
2. Taken from JP 1-02, Mar 2007, definition of effect.

# Framework – What is MBT&E?

## MISSION AND SYSTEM

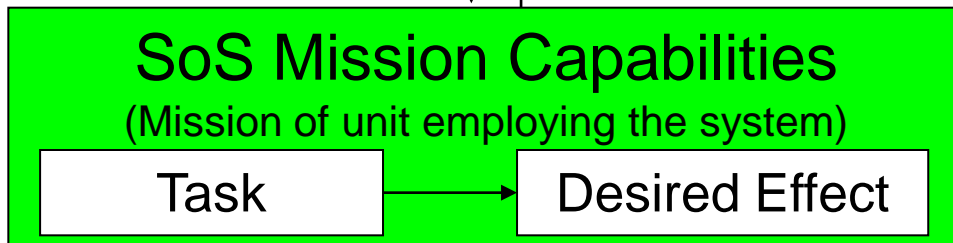
## EVALUATED BY

## TESTED BY



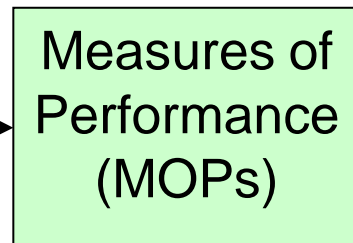
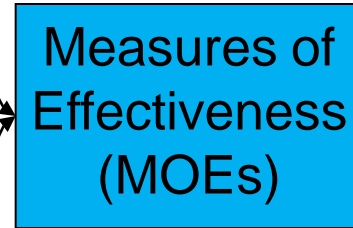
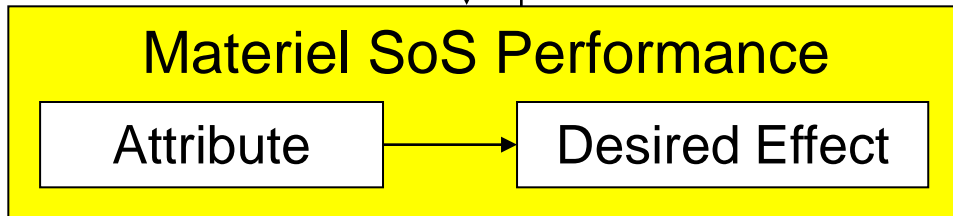
MISSION PLANNING

ENABLES



SYSTEMS ENGINEERING

ENABLES





# 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

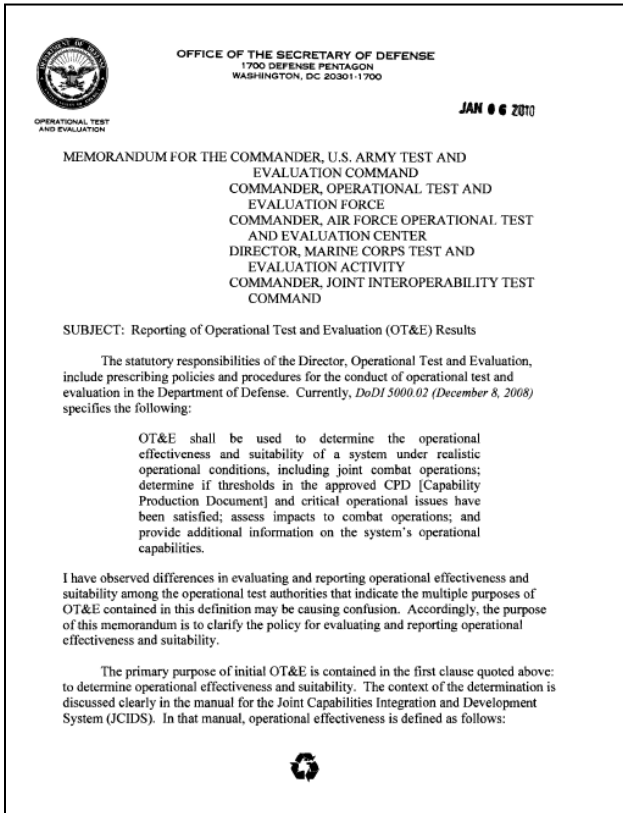
- Execute test and evaluation.

## REPORT THE RESULTS

- Format and report the results.

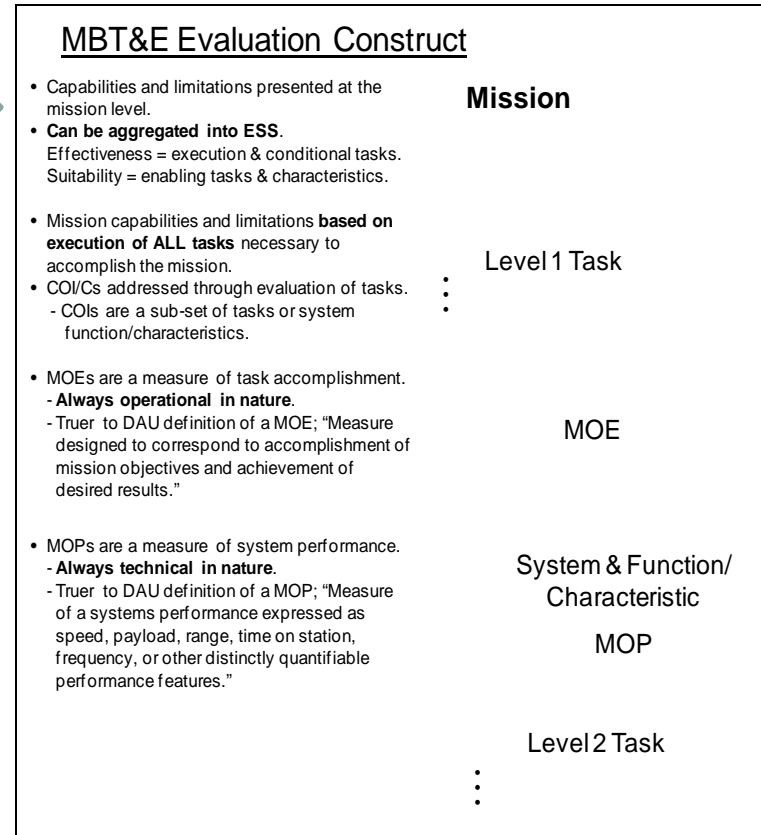
# Recent Guidance – Azimuth Check

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



**MOEs**  
**Measure of mission accomplishment.**

**MOPs**  
**Measure of system performance.**







# Where is it taking us?

- ATEC is using the MBT&E methodology to:
  - Fully addresses recent acquisition initiatives.

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Result: The “strengths and weaknesses of a system and its components, and the effect on operational capabilities and limitations”<sup>1</sup> are identified.

2

Result: T&E supports the “collaborative planning and collaborative execution of test phases and events to provide shared data”.<sup>2</sup>

- Create integrated, robust, and efficient T&E strategies.

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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.

### MRAP-ATV T&E Strategy

#### Developmental Test

M-ATV Mission	DT Element
Security	Mobility, HFE, Environmental, Durability, Interoperability, Live Fire
Mounted Patrols	Mobility, HFE, Environmental, Durability, Interoperability, Live Fire
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
Maintenance Support	Transportability, HFE, Durability, Environmental
Transportation Support	Transportability, Mobility, HFE, Environmental
Sustainment Support	Transportability, HFE, Durability, Environmental

#### Operational Test

### 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)
    - Combat Logistics Patrol ( 2 x Missions)
    - Raid (2 x Missions)
    - Cordon and Search ( 3 x Missions)
    - Key Leader Engagement (2 x Missions)
  - 4 x STEs:
    - Fording/Urban Mobility/Visibility/CBRNE
    - Recovery
    - Drivers Vision Enhancement(DVE)/Night Vision Devices (NVD)
    - Weapons Live Fire

Security  
 Mounted Patrols  
 Convoy Protection  
 Reconnaissance  
 Command and Control  
 Casualty Evacuation  
 Data Interchange

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# 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

## Skid Steer Loader OTA Evaluation Report

### 3 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.

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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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