

Slogan-Based T&E: Words Have Meaning

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U.S. Army Test and Evaluation Command



Agenda

Purpose of T&E Defined

Definitions

- Capability
- System Performance
- Evaluation Measures
- Capability to Performance

Framework

- Linkages
- Example

Framework Benefits



Purpose of T&E

Fundamental Principals guiding all T&E¹:

“All testing and evaluation programs should experiment to learn and understand the **strengths and weaknesses of a system** and its components, **and the effect on operational capabilities and limitations.**”

Reporting of OT&E Results²:

“The primary purpose of initial OT&E is contained in the first clause quoted above: to **determine operational effectiveness and suitability.** ...

The second purpose of OT&E stated in 5000.02 is more closely linked to the development and acquisition process, which is ‘to determine if **thresholds in the approved CPD** and critical operational issues have been satisfied.’”

**System Strengths and Weaknesses:
CPD Thresholds**

Effect
on

**Operational Capabilities & Limitations:
Operational Effectiveness & Suitability**

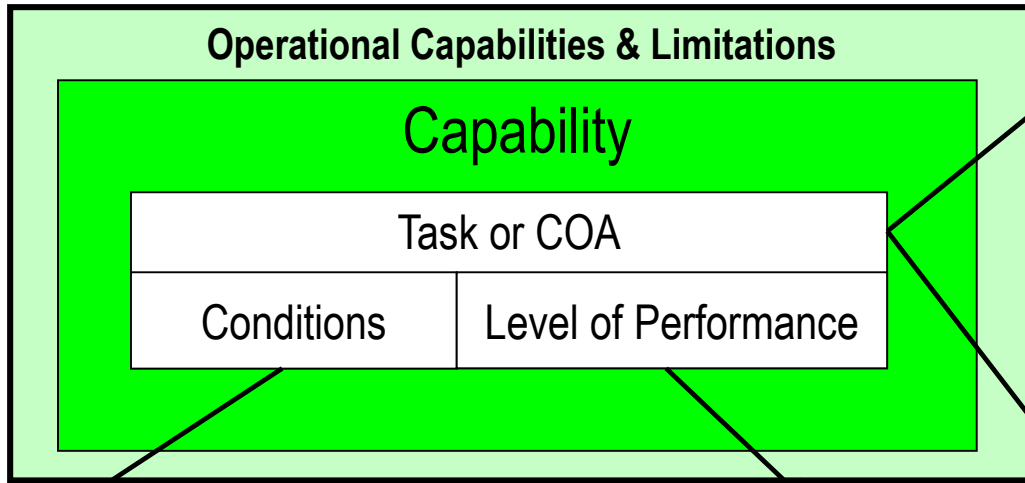
1. Office of the Under Secretary of Defense (AT&L), Section 231 Report, Jun 07.
2. DOT&E Memo, Reporting of OT&E Results, 6 Jan 10.



Definitions - Capability

Capability³

“The ability to complete a **task** or execute a **course of action** under specified **conditions** and **level of performance**.”



Task⁴

A clearly defined **action or activity specifically assigned to an individual or organization** that must be done as it is imposed by an appropriate authority.

COA⁴

1. Any **sequence of activities that an individual or unit** may follow. 2. A scheme developed to accomplish a mission.

Condition⁴

Those variables of an **operational environment** or situation in which a **unit, system, or individual is expected to operate** and may affect **performance**.

Measure of Performance⁴

A criterion used to assess friendly actions that is tied to measuring **task accomplishment**.

3. Chairman Joint Chiefs of Staff Instruction, CJCSI 3170.01, 23 Jan 2015.

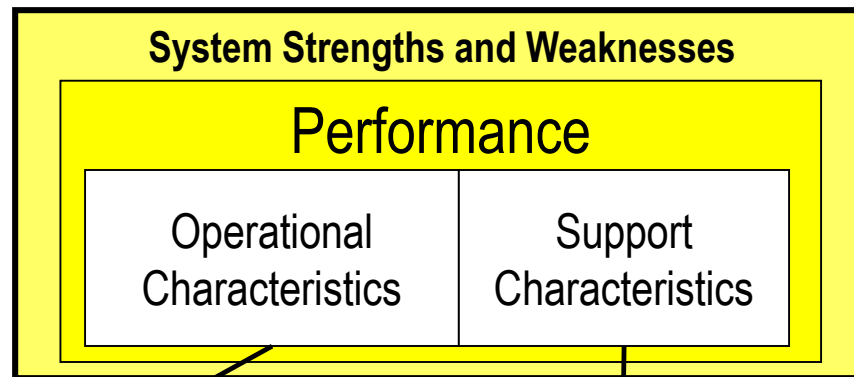
4. Joint Pub. 1-02, 8 Nov 10 (as amended 20 Jan 15).



Definitions – System Performance

System Performance⁵

“Those **operational and support characteristics of the system** that allow it to effectively and efficiently perform its assigned mission over time. The support characteristics of the system include both supportability aspects of the design and the support elements necessary for system operation.



Measure of Performance⁵

System-particular performance parameters such as speed, payload, range, time-on-station, frequency, or other distinctly quantifiable performance features.

Measure of Suitability⁵

Measure of an item's **ability to be supported** in its intended operational environment. MOSs typically relate to readiness or operational availability and, hence, reliability, maintainability, and the item's support structure.

5. DAU, Glossary of Defense Acquisition Acronyms & Terms, 15th ed. Dec 12.



Definitions – Evaluation Measures

Operational Capabilities & Limitations

Capability: ability to accomplish a task

Task/COA: action or sequence of activities assigned to individual or unit

Conditions:
operational environment

Level of Performance:
Task accomplishment

Evaluated by

Measure of Effectiveness

MOE²

“The data used for evaluation are appropriately called measures of effectiveness, because they measure the **military effect (mission accomplishment)** that comes from the use of the system in its expected environment.”

System Strengths and Weaknesses

Performance: characteristics of a system

Operational Characteristics:
performance parameters

Support Characteristics:
ability to be supported

Evaluated by

Measure of Performance

MOP²

“The measures used are appropriately referred to in the **context of ‘performance’** as in ‘key performance parameters,’ or ‘measures of performance.’ As such they should be referred to as measures of performance (MOP) and not measures of effectiveness (MOE).”

2. DOT&E Memo, Reporting of OT&E Results, 6 Jan 10.

Note: Definition of mission: “The task, together with the purpose, that clearly indicates the action to be taken and the reason therefore. (JP 3-0).”



Definitions – Capability to Performance

Operational Capabilities & Limitations

Capability: ability to accomplish a task

Task/COA: action or sequence of activities assigned to individual or unit

Conditions:
operational environment

Level of Performance:
Task accomplishment

Evaluated by

MOE:
measure of the Military effect (task/COA/mission Accomplishment)

Effect on

Systems Engineering⁶ “A logical sequence of activities and decisions that transforms an operational need into a description of system performance parameters and a preferred system configuration.”

System Strengths and Weaknesses

Performance: characteristics of a system

Operational Characteristics:
performance parameters

Support Characteristics:
ability to be supported

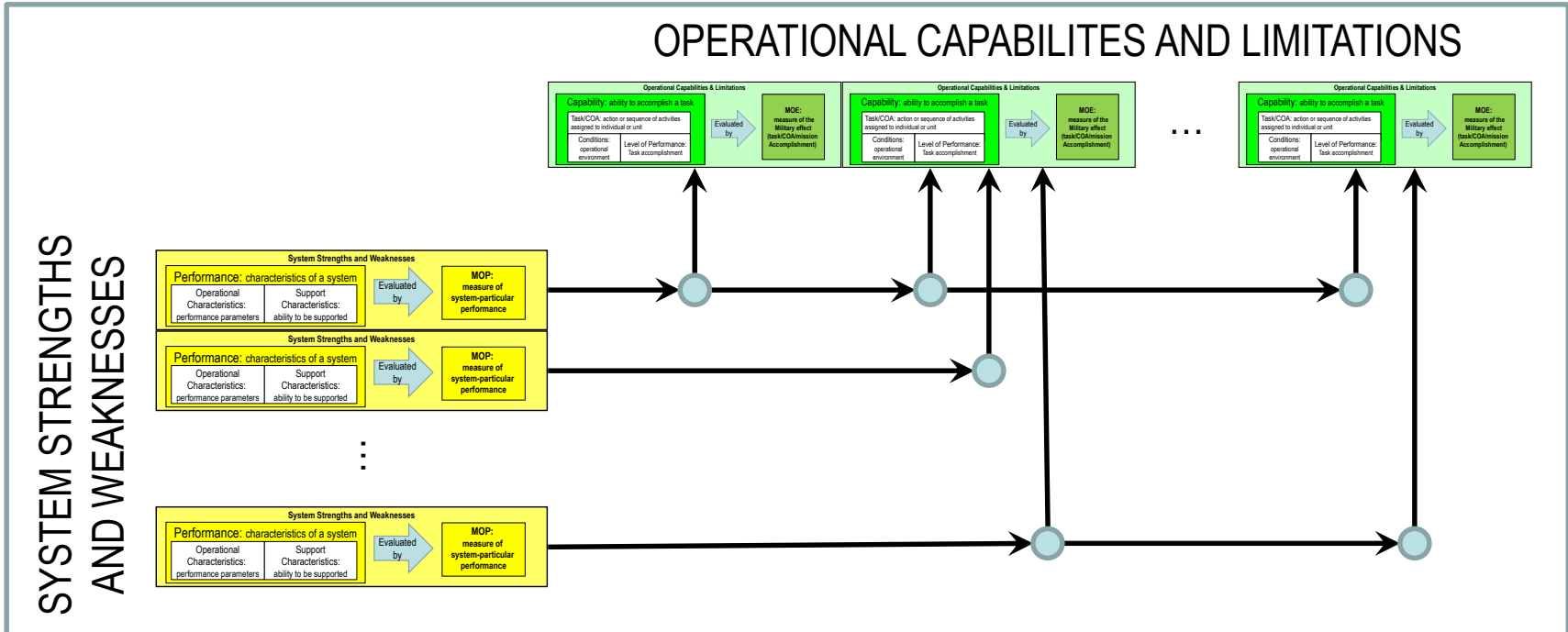
Evaluated by

MOP:
measure of system-particular performance

6. MIL-STD-499A, Engineering Management, 1 May 1974, now cancelled.



Framework - Linkages



Fundamental Principals guiding all T&E:

- ✓ “...strengths and weaknesses of a system ...and the effect on operational capabilities and limitations.”

Reporting of OT&E Results:

- ✓ “...determine operational effectiveness and suitability...”
- ✓ “...determine thresholds in the approved CPD...”



Framework - Linkage Example

Operational Capabilities & Limitations

Capability: Conduct Surface to Surface Attack
(ART 3.2.1.1)

Task/COA: Fire Mission
(FM 3-09.70, Task 11)

Conditions:
Low Angle FFE,
day, **in/out limits**

Level of Performance:
"...ready to fire within 30
seconds..."

Evaluated
by

MOE 1:

% of missions meeting
accuracy standard

MOE 2:

% of missions meeting
Timeliness standard

Effect on

System Strengths and Weaknesses

Performance: Turret Traverse Limits

Operational Characteristic: Must traverse 800 mils
left/right from center line. (Additional Attribute #23,
M109 FoV CPD)

Evaluated
by

MOP 1:

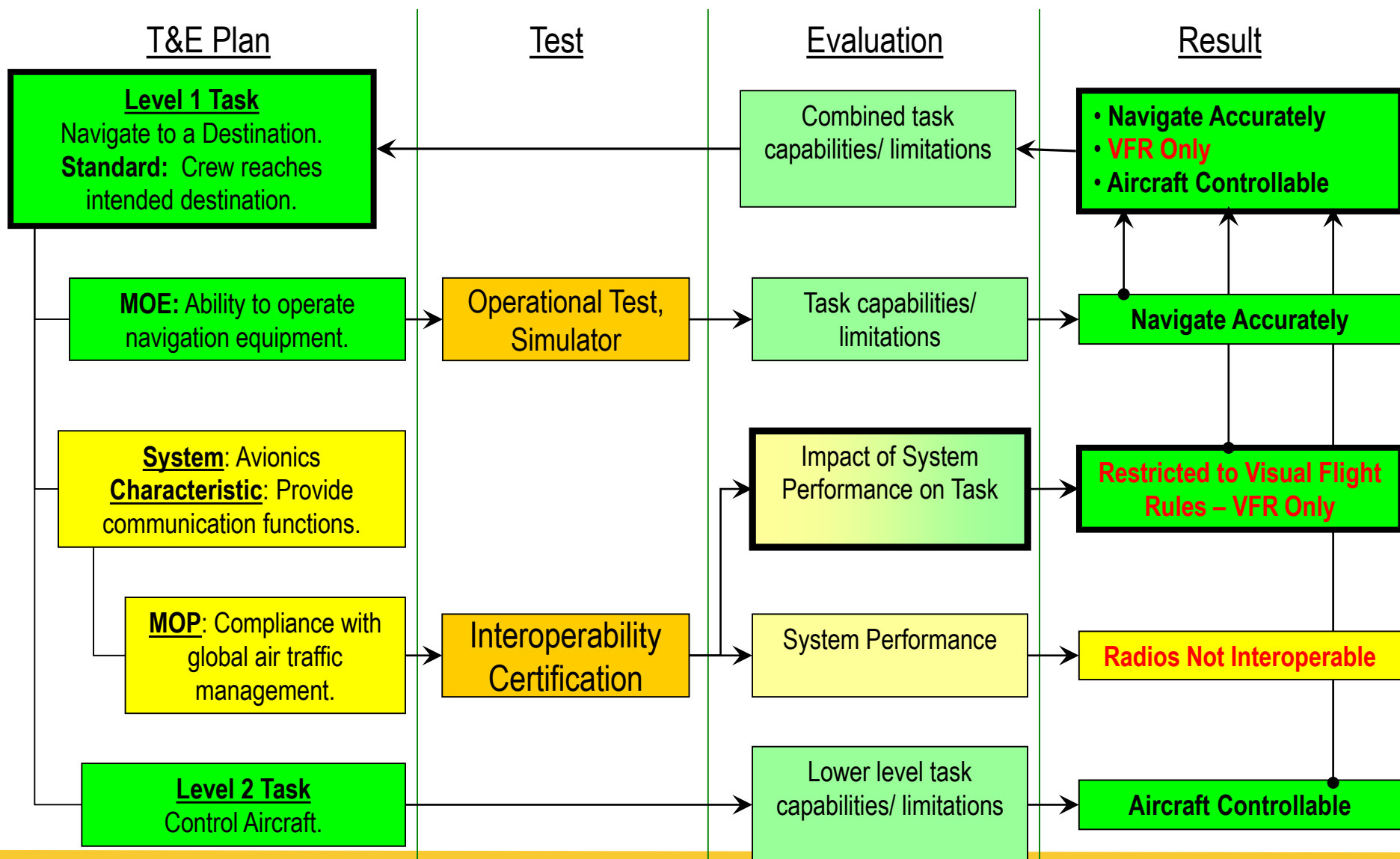
Traverse accuracy

MOP 2:

Time to orient tube



Framework - Reporting Example





Framework Benefits

A Report effectiveness, suitability and survivability based on capabilities and limitations.

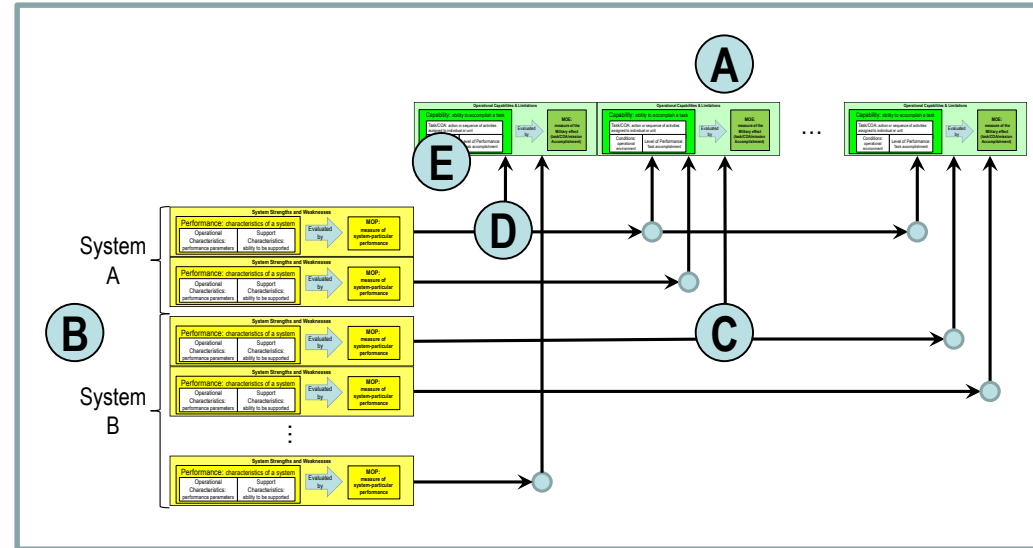
B Supports Joint, networked, system-of-systems T&E.

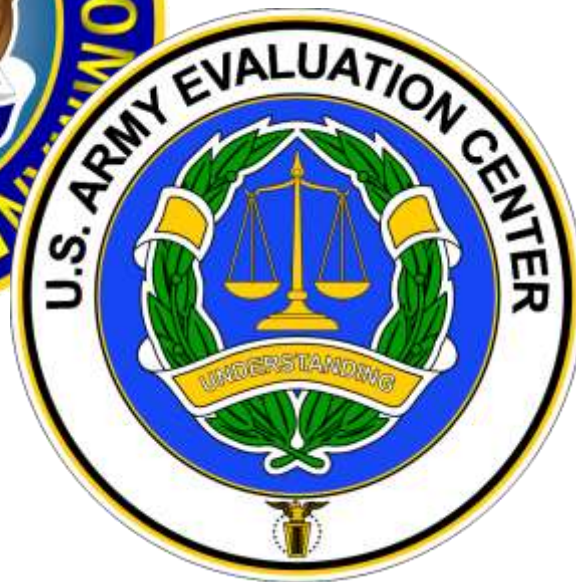
C Right scoped OT based on how system impacts operational capabilities

D Impact of DT results on operational capability known through linkage of performance and capabilities. Allows **integration of Developmental (DEF) and Operational frameworks (COLs)** integrated to **identify deficiencies early** and provide **continuous evaluation** of progress.

E Integrated T&E through...

- **Operational conditions** from capability applied to **DT conditions**;
- **Integrated use** of contractor, DT, OT and M&S; and
- Focus OT on system **function impact on task capability**.





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