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DoD Manual (DoDM) 5000.99
Realistic Full Spectrum Survivability and Lethality Testing

Director, Operational Test and Evaluation (DOT&E)

UNCLASSIFIED

Purpose and Applicability

The DoD Manual (DoDM) 5000.99 will provide guidance as to how to plan, execute, analyze and report full spectrum survivability and lethality testing.

High-Level Purpose

Implements policy, assigns responsibilities, and provides procedures for realistic full spectrum survivability and full spectrum lethality testing of DoD systems and services, in accordance with DoDD 5141.02 and DoDI 5000.98.

DoD MANUAL 5000.99

REALISTIC FULL SPECTRUM SURVIVABILITY AND LETHALITY TESTING

Originating Component:
Office of the Director, Operational Test and Evaluation

APPLIES TO:

- All DoD Components
- DoD systems acquired via the Defense Acquisition System
- DoD systems under special access controls
- Non standard acquisition systems

Policy Understanding: Key Definitions

To understand the why of this policy document, focus needs to be aligned on important definitions.

Realistic Full Spectrum

Lethality

- Degree to which an offensive **capability can deny, disrupt, destroy, or degrade the adversary** target's mission critical functions or induce a catastrophic event in a contested, congested, and constrained operational environment.
- Includes the **effect of the adversary's susceptibility, vulnerability, and recoverability from the attack**, and the **evaluation of collateral damage effects**.

Survivability

- Degree to which a system and its users **can survive and resume the mission in a contested, congested, and constrained environment** to an engagement by a live kinetic threat, non-kinetic threat, and their combined effects.
- Includes **susceptibility to attack, vulnerability if hit, recoverability from the attack, user casualties and the effect of susceptibility, vulnerability, and recoverability** on operational effectiveness and suitability.

Kinetic vs. Non-Kinetic, Significance, and Key Policy

As the battlefield evolves across the full spectrum to include both kinetic and non-kinetic threats and targets, DoDI 5000.99 expands the survivability and lethality testing of covered systems to include non-kinetics, in accordance with Section 223 of Public Law 117-81.

Kinetic Threats

Weapon types that depend on **direct physical destruction of the target** through weapon effects such as impact, blast, fragmentation, and shock.

Non-Kinetic Threats

Unconventional threats/actions that **impart adverse effects without direct physical force –** examples: cyber, EMS (radio frequency, directed energy), and CBRN.

This Testing Expansion Includes:

Kinetic	Cyber	Electromagnetic Spectrum (EMS)	Chemical, Biological, Radiological, and Nuclear (CBRN)	Other Operationally Relevant Kinetic and Non kinetic Threats and Targets
				
M1 Abrams Tank Firing Main Gun	*Monitoring Cyber Attacks*	*Counter Communications System*	*CBRN Training*	*Other Future and Unknown Threats*
1	2	3	4	5

Science and Technology Based Testing Across the Full Spectrum

Testing will take place across the full spectrum and based in science and technology. Realistic full spectrum survivability and lethality testing will also use the latest available Intelligence Community knowledge and artifacts.

Planning, execution, and reporting of full spectrum testing will plan to…

- Determine the **full spectrum survivability and lethality** of DoD systems
- Plan and execute risk-based level of test assessments and **MBRAs**
- **Optimize the use of data** from multiple data sources (CT, DT, LF, etc.)
- Enable **timely and dynamic evaluation** of all changes and advances across the full spectrum
- Enable evaluation in multi-domain operations **against kinetic and non-kinetic** threats and targets
- Identify the operational environment **thresholds of mission support systems**

This will pull in data and results from…

CT&E **DT&E** **LFT&E** **OT&E** **M&S** **Other T&E Events** **Major or Combatant Command Activities**

…and integrate it to support the planning, execution, analysis, and reporting across the full spectrum.

Operation Test and Evaluation (OT&E)

Section 3.3 in DoDM 5000.99 focuses on OT&E, with a specific focus on Operational Test Agencies (OTAs). OTAs must evaluate the effect of **full spectrum survivability and lethality** on operational effectiveness and suitability of DoD systems with **trained operators**, including cyber defenders, in operationally representative, **contested, congested, and constrained environments**.

OTAs will use applicable, planned OT&E events to collect the live data and generate M&S results for:

- Susceptibility*
- Vulnerabilities
- Recoverability
- Lethality

OTAs use live data and M&S results from LFT&E and OT&E events required to evaluate operational effectiveness and suitability. OTAs will:

- Use known and newly discovered exposures and vulnerabilities to attempt to degrade critical mission functions
- Observe and evaluate results of users, maintainers, and defenders in a maintainability demonstration

For OT&E events OTAs will generate a detailed plan and a report. OTAs will:

- Confirm each event incorporates the system-of-systems with information, configurations, users, and operational environments
- Represent the adversaries' most likely and dangerous COAs

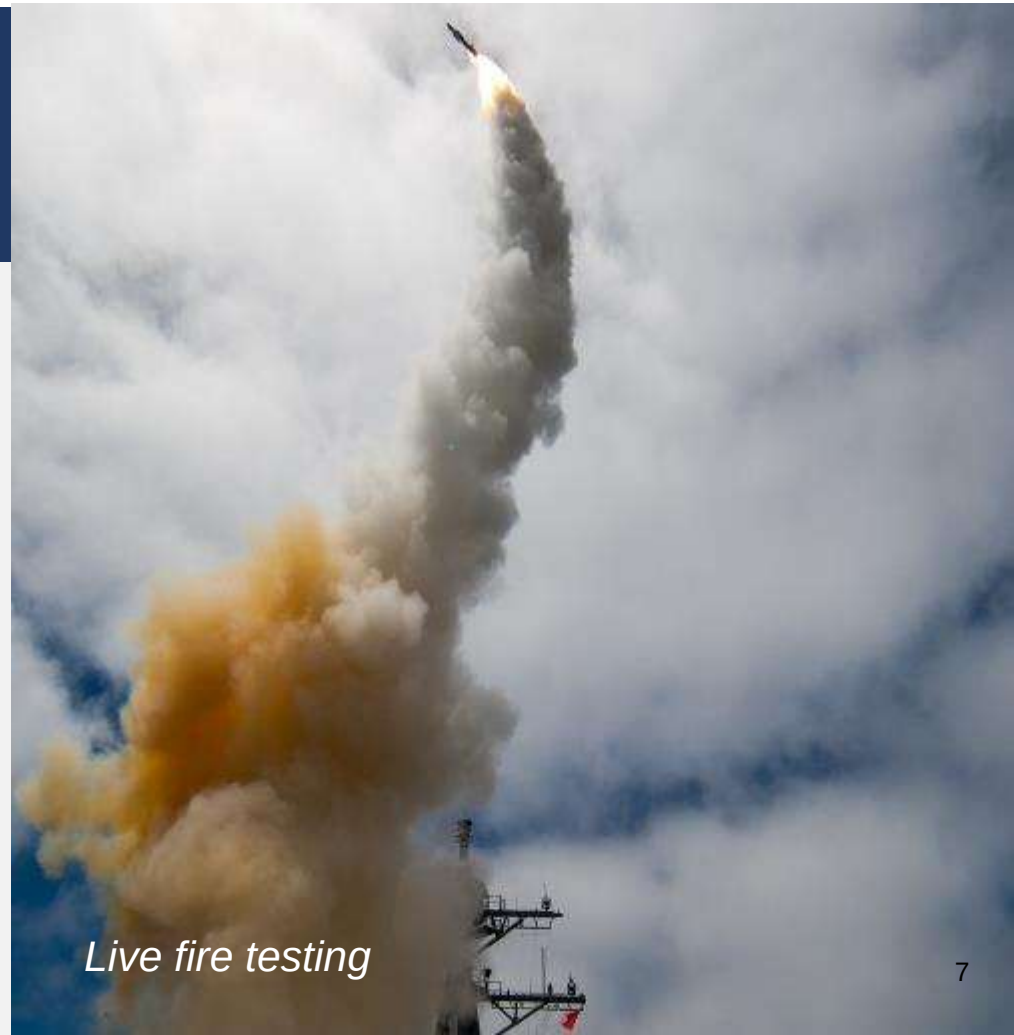
**Susceptibility evaluation may include situational awareness, threat detection, signature control, electromagnetic protection (EP) and attack (EA), deception, expendables, threat suppression, and the ability of DoD systems or cybersecurity providers to prevent threats from degrading or destroying the system.*

Live Fire Test and Evaluation (LFT&E)

Section 3.4 in DoDM 5000.99 focuses on LFT&E, with the LFT&E Working Group (WG) responsible for following the procedures within Paragraph 3.4 of DoDI 5000.98.

LFT&E will start in initial stages of DoD system development and continue testing early DoD system configurations, production- or fielding-representative, and system-of-system levels to:

- Identify and ensure the **collection of the live data** and M&S results required to **inform the susceptibility evaluation**.
- Identify, manage, and propose **mitigation to DoD system design vulnerabilities** to live kinetic and non-kinetic threat effects at various levels.
- **Evaluate force protection capabilities** and identify user casualties.
- **Evaluate battle damage assessment**, repair, and recovery procedures – including the time to repair/restore systems.
- **Collect live data** and M&S results to support the above evaluations,
- Evaluate the mechanism required to **achieve the effect to deny, degrade, disrupt, deceive, destroy, exploit, or influence** kinetic and non-kinetic targets.



Live fire testing

Test Management and Planning

Planning is in accordance with DoDI 5000.98 and DoDM 5000.100 and includes the risk-based level test assessment, MBRA, and other factors. This also considers the latest threats and potential vulnerabilities, attack surface analysis, and mission critical functions.

Program Manager (e.g., DOT&E, OTA)

- Establishes working groups, helps develop strategies, requirements, etc., and ensure resources
- Plans, executes, and reports on a risk-based level of test assessments and MBRAs

Operational Test Agencies (OTAs)

- Plans and executes OT&E
- Coordinates live data and M&S collection with LFT&E organizations
- Serves as accreditation authority for M&S tools used to support the evaluation of operational effectiveness and suitability

LFT&E Organizations

- Conducts LFT&E activities
- Accredits M&S tools and supporting V&V activities
- Provides oversight of relevant contractor planning and results
- Reports data, M&S results, analysis, and reports for integration into final determinations.

Test Plans Will Be Required For:

- Cooperative and adversarial tests
- Measurement and evaluation of susceptibility
- Characterization of the offensive capability and its lethal effects
- End-to-end offensive capability lethality testing

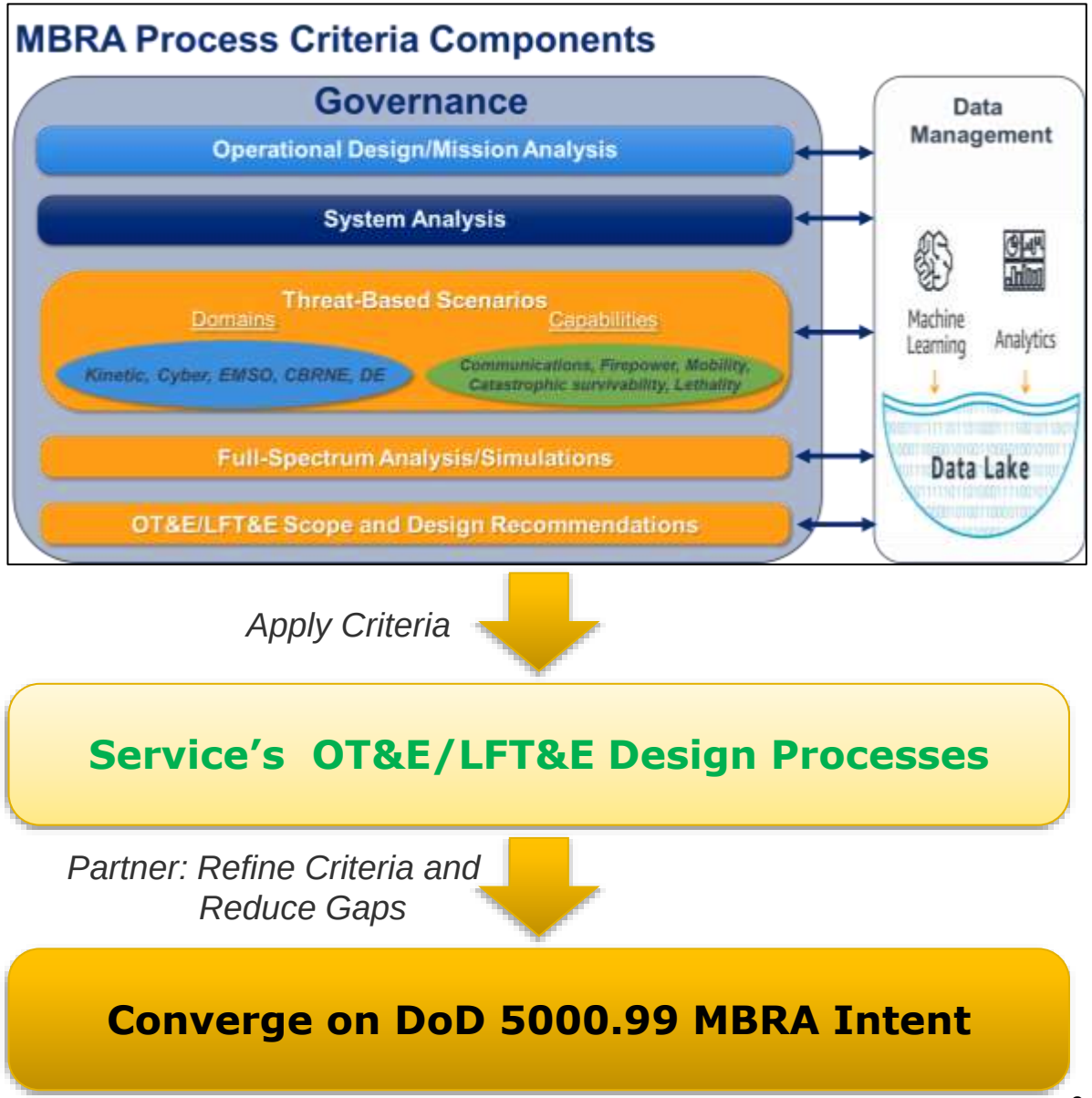
The T&E IPT/ITWG will evaluate and inform full spectrum survivability and lethality requirements to identify weak or missing requirements and assess their testability. The program manager will use these findings to ensure the DOD system is protected against adversarial threats.

Mission-Based Risk Assessments

DoDI 5000.98 & DoDM 5000.99 on MBRAs: Conducted or "…**updated at each acquisition decision …"** in order to:

- "…**Evaluate** and mitigate **risks** in DoD **missions**…"
- "…**Inform** the **scope** and focus of realistic full spectrum survivability and lethality testing..."
- Provide a "…**defensible** scope of **relevant** OT&E and LFT&E…"
- "… **Prioritize** the full spectrum survivability and lethality **testing** of sub-components, … systems-of-systems."
- Assess "…**potential vulnerabilities** and risks to **mission critical functions**, components, and interfaces in the **contested, congested, and constrained operational environment...**"
- Account for "…the **latest threat, attack surface** analysis…"
- **Informs the TEMP/T&E strategy** and updates "…as the threat, DoD system, operational environment, or mission **evolve."**
- "Characterized by quantitative and qualitative analyses, and realistic mission/threat engagement scenarios…"
- "Consider current/future adversarial kinetic and non-kinetic capabilities."

Define MBRA



5000.99 Guidance

DoDM 5000.99
Full Spectrum

- **Cyber OT&E/LFT&E** *Guidebook*
- **EMSO OT&E/LFT&E** *Guidebook*
- **Kinetic OT&E/LFT&E** *Guidebook*
- **CBRN OT&E/LFT&E** *Guidebook*
- **Full Spectrum OT&E/LFT&E** *Guidebook*

Vision: Wiki-like digital content that will be dynamically managed and informed by a stakeholder-involved governance process.

CLOSING STATEMENTS

Q/A

THANK YOU