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Jan 14, 2025

Department of Defense
OFFICE OF PREPUBLICATION AND SECURITY REVIEW



Operational Test and Evaluation and Live Fire Test and Evaluation Policy Motivation & Opening Comments

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Office of the Secretary of Defense

Policy Overview Workshop
/ December 12, 2024

Transformation of Today's Battlefield...

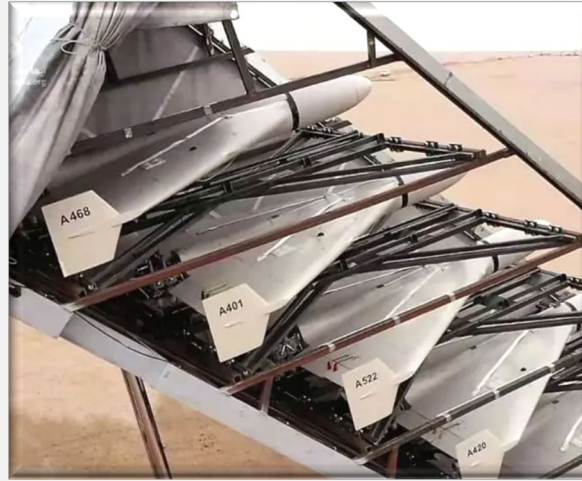


SEAMLESS COLLABORATION ACROSS ALL DOMAINS

ATTRITABLE SYSTEMS AT SCALE

ENABLED BY AUTONOMY & AI

Transformation of Today's Battlefield...



LONG-RANGE LETHALITY

ATTRITABLE SYSTEMS AT SCALE

CONTESTED ELECTROMAGNETIC SPECTRUM

ANTI-ACCESS / AREA DENIAL (A2/AD)

Challenges to the Faster and Cheaper Delivery of Weapons that Work

There are several challenges with our current state that may inhibit our goal, often having cascading effects between each.



Challenges to the Faster and Cheaper Delivery of Weapons that Work

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Cultural

In our T&E Enterprise – contractor, developmental live fire, and operational testing often operate in separate silos



Technological

Our tools and processes designed for hardware capabilities, versus those defined for software



Methodological

We often fail to obtain nor analyze a holistic “whole body of evidence” that considers output from all phases of test to support acquisition decisions.



Compare and Contrast: Culture

Our T&E Culture



CURRENT STATE

- CT, DT, LF, OT, and M&S operate in separate silos
 - Operational contexts not introduced until late in T&E campaigns → late deficiency discovery, cost overruns, delays



FUTURE STATE

- Integrated T&E that collects and analyzes targeted data to maximize operational performance knowledge early and often, while optimizing test resources
- Deficiencies discovered early, when they are easiest and least expensive to fix



Coordination, Cooperation,
and Teamwork



Compare and Contrast: Technology

Our T&E **Technology** – Data Repositories and Linkages



CURRENT STATE

- Scattered spreadsheets
- Data is not VAULTIS [Visible, Accessible, Understandable, Linked, Trustworthy, Interoperable, Secure]
- Unsuitable for modern data analytics and AI
- No linkage → Decisions not necessarily data-driven and T&E gaps can be hard to identify



FUTURE STATE

- Streamlined databases
- Data is VAULTIS
- Suitable for modern data analytics and AI
- Transparent linkage across acquisition decisions, operational performance metrics, test events, test data, and M&S
→ Data-driven decision-making and straightforward T&E gap identification



Geographically Distributed Enterprise Data
and Analysis Architecture and Tools –
Digital Transformation that meets all users
where they are

Compare and Contrast: Methodology

Our T&E Methodology – Experimental Design and Body of Evidence



CURRENT STATE

- Early 1900s classical design of experiments
 - Static test design
 - Data collected during different phases of test typically cannot be combined
 - Test resources are not optimized, resulting in redundant or unnecessary testing



FUTURE STATE

- We invent dynamic, adaptive design of experiments and implement them in easy-to-use, real-time software
 - Data collected during all phases of test is combined and analyzed as a “whole body of evidence”
 - Dynamically optimized test resources



Bayesian Inference + Modern
Computer Hardware and Software

Compare and Contrast: Methodology

Our T&E Methodology – M&S and Its V&V



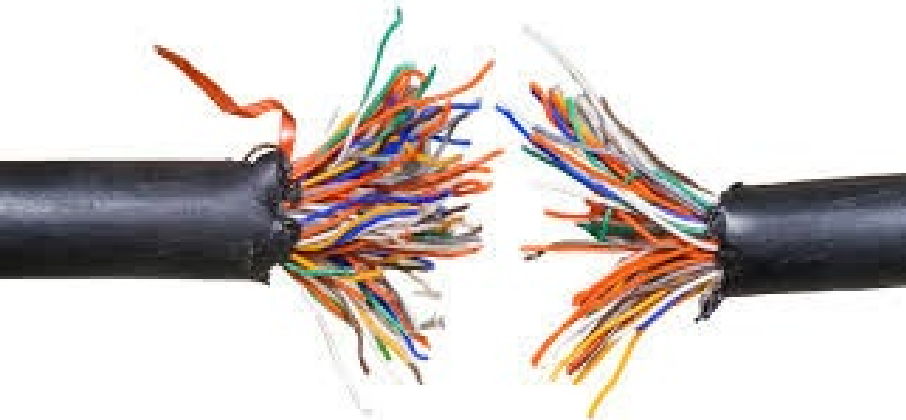
CURRENT STATE

- The use and V&V of M&S is sporadic and unsynchronized
 - It is often an afterthought to apply M&S to T&E after it was developed for another purpose
 - V&V is typically not in accordance with the lifecycle approach detailed in DoDI 5000.09 “M&S VV&A”
- Lost opportunities to credibly apply M&S more broadly for the purposes of T&E across program lifecycles



FUTURE STATE

- A deliberate lifecycle approach to developing and “V&V’ing” M&S for the purposes of T&E, that is synchronized with live test data in accordance with DoDI 5000.09 “M&S VV&A” to generate a “predict, live test, refine” feedback loop
 - Credibly interrogate complex scenarios that might not be possible to orchestrate exclusively in the live domain
 - Expose early prototypes to operational contexts in digital worlds



Digital Engineering + Digital Twins +
Uncertainty Quantification for Rigorous
V&V Integrated Into Analysis Workflows



DOT&E Strategic Pillars



PILLAR 1

Test The Way We Fight



PILLAR 2

*Accelerate The Delivery
of Weapons That Work*



PILLAR 3

*Improve the
Survivability of DoD in a
Contested Environment*



PILLAR 4

*T&E of Weapon Systems
Built to Change Over Time*

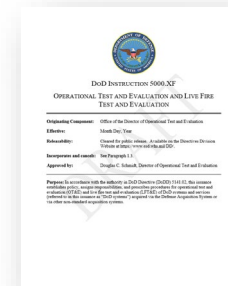


PILLAR 5

*Foster an Agile & Enduring
T&E Enterprise Workforce*

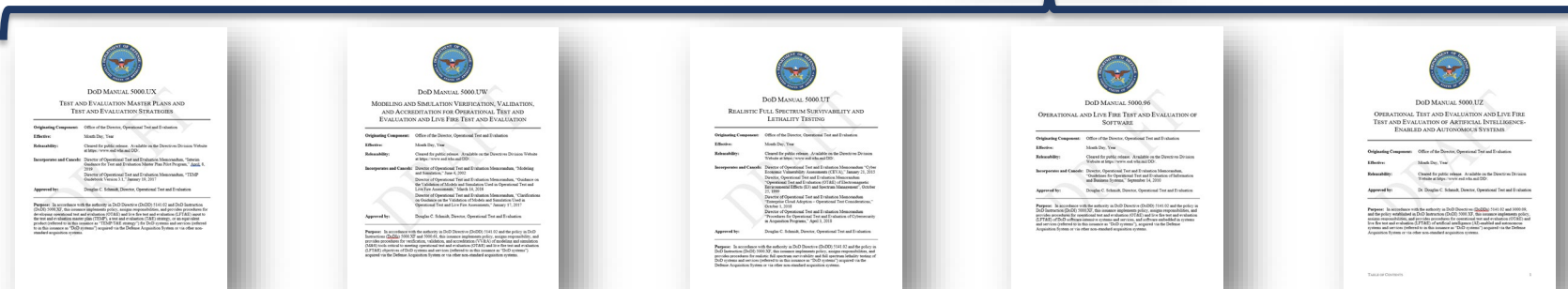
DOT&E is Implementing a Comprehensive Approach to Policy and Guidance

- **DOD Instruction** – captures strategy intent and identifies organizational roles and responsibilities.
- **DOD Manuals** – translates policy into practice for core processes (TEMP/TES) and key technical challenge areas.
- **Guidebooks** – provide detailed implementation. Looking for partnerships with DTE&A, the Services, and specific programs to shape content.



DoDI 5000.98
OT&E LFT&E

What/Why



DoDM 5000.100
TEMP/TES

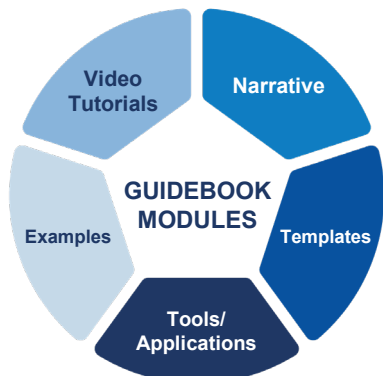
DoDM 5000.102
M&S VV&A

DoDM 5000.99
Full Spectrum

DoDM 5000.96
Software

DoDM 5000.101
**AI-Enabled and
Autonomous Systems**

GUIDEBOOKS



How

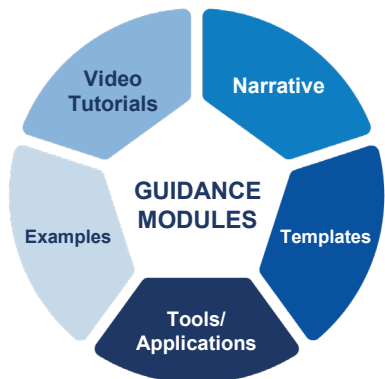
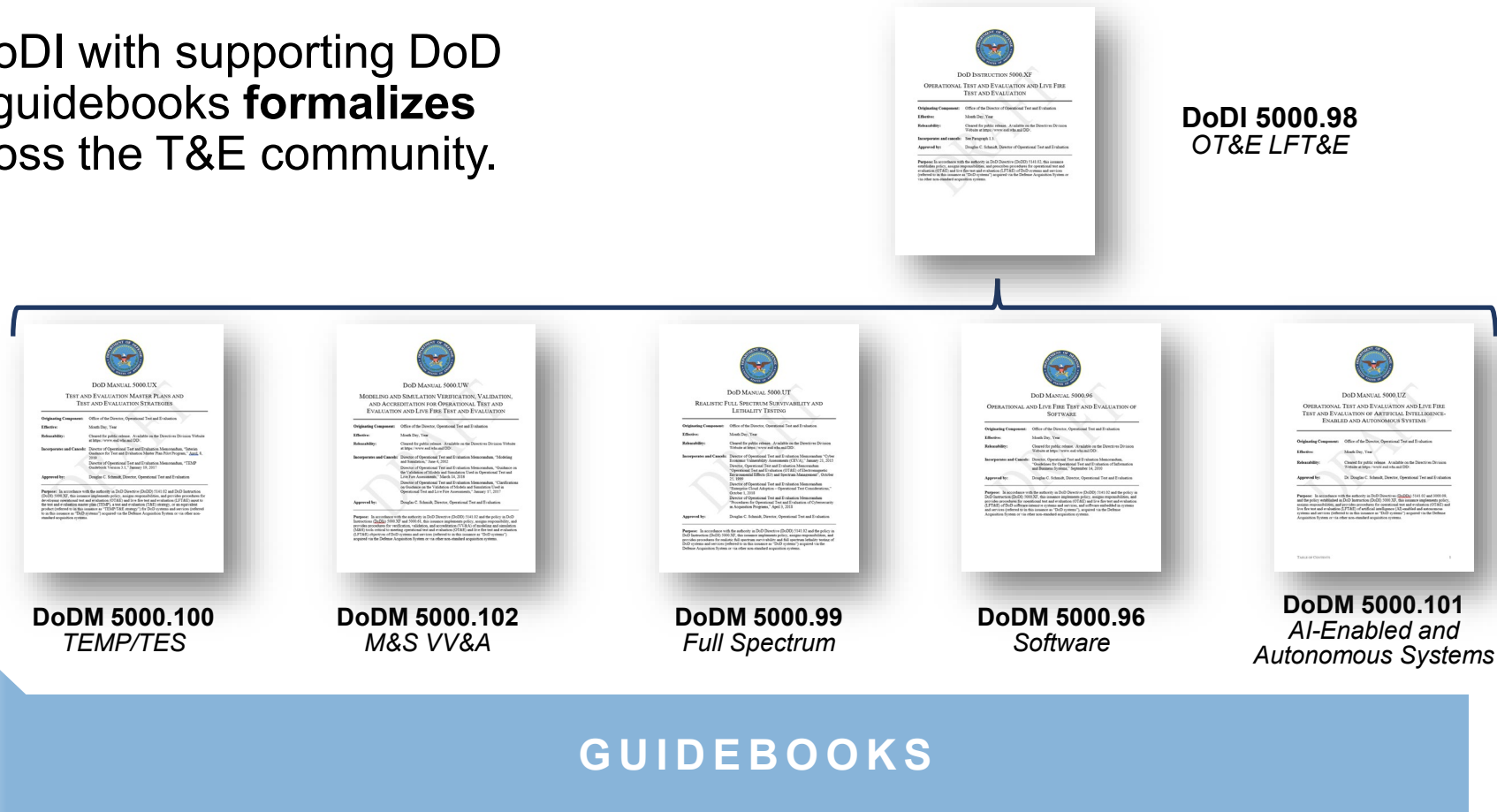
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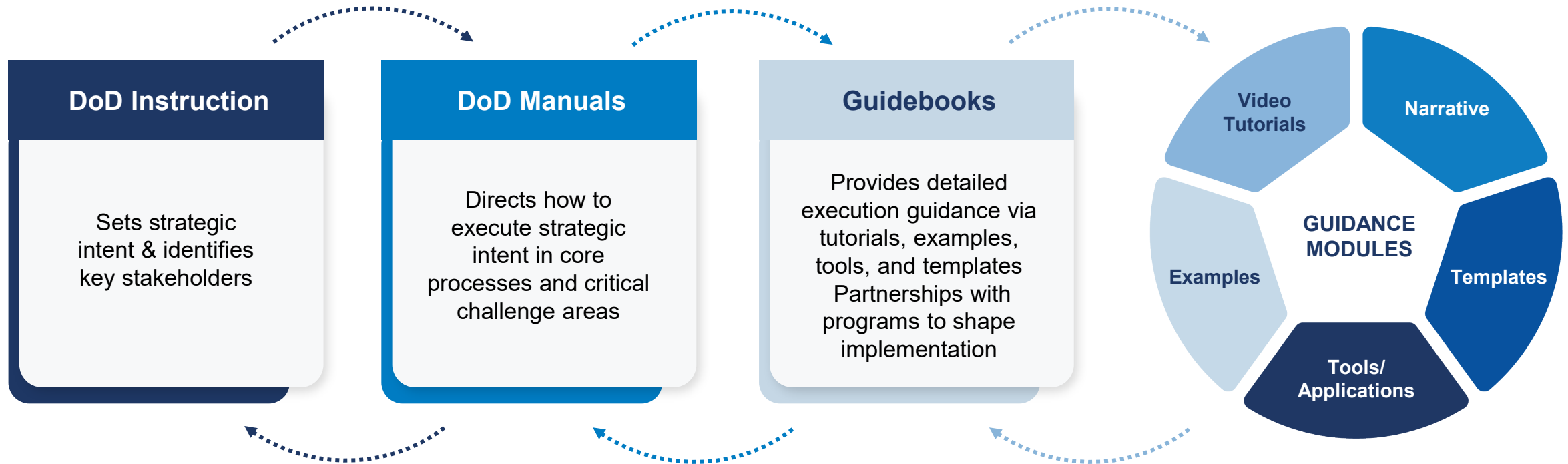
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- **Clarifies roles and responsibilities:** DoDMs specifically assign roles and responsibilities, making it easier to hold parties accountable for compliance.



DoD Instruction, Manuals, and Guidebooks Provide Information at the Speed of Relevance

UPDATED PERIODICALLY:

- Incorporate best practices developed with programs
- Reflect emerging technologies



UPDATED RARELY:

- Updates reflect major shifts in strategic intent / roles and responsibilities

UPDATED ON DEMAND:

- As new content is developed / available
- Responsive to T&E practitioner needs

How to Help Us Help to Deliver Weapons that Work... Faster

