Developmental Test & Evaluation Policy Vectors

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T&E Policy

Developmental Test & Evaluation
OUSD(AT&L)/Systems & Software Engineering

Outline

- Intro to OSD DT&E
- DT&E Mission, Roles and Functions
- DT&E Priorities

Common Threads Through Breached Programs

- **Nine key failures visible in current Nunn-McCurdy breaches:**
  - **Change in doctrine, driving quantity or mission changes**
  - **Requirements problems (unrealistic, not stable, creep, etc.)**
  - **Lack of a robust baseline**
  - **Inadequate SE / T&E, risk management, and or FMECA**
  - **Inadequate staffing / experience / oversight levels**
  - **Poor reliability**
  - **Acquisition reform**
  - **Schedule / cost realism (concurrency, estimation, etc.)**
  - **Contract (warranty, price curves, TSMR, etc.)**

Top 10 Emerging Systemic Issues

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1. Management	• **IPT roles, responsibilities, authority, poor communication** • **Inexperienced staff, lack of technical expertise**
2. Requirements	• **Creep/stability** • **Tangible, measurable, testable**
3. Systems Engineering	• **Lack of a rigorous approach, technical expertise** • **Process compliance**
4. Staffing	• **Inadequate Government program office staff**
5. Reliability	• **Ambitious growth curves, unrealistic requirements** • **Inadequate "test time" for statistical calculations**
6. Acquisition Strategy	• **Competing budget priorities, schedule-driven** • **Contracting issues, poor technical assumptions**
7. Schedule	• **Realism, compression**
8. Test Planning	• **Breadth, depth, resources**
9. Software	• **Architecture, design/development discipline** • **Staffing/skill levels, organizational competency (process)**
10. Maintainability/Logistics	• **Sustainment costs not fully considered (short-sighted)** • **Supportability considerations traded**

Major contributors to poor program performance

Early Lifecycle Planning

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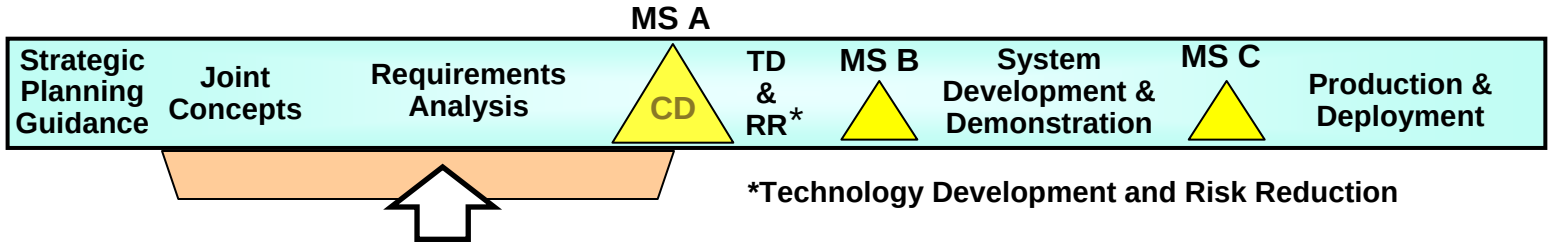
- **Early lifecycle involvement of Systems Engineering to:**
  - Inform evaluation of alternatives with technical insights
  - Ensure solutions balance requirements with technical feasibility
  - Ensure solutions can be validated and verified
  - Use Modeling & Simulation to help refine warfighter concept of operations/system requirements, evaluate design alternatives, and identify potential technology/human interface constraints
- **Appropriate resourcing (personnel/funding) required**
- **Include in requirements, specifications, and contracts**



Sustainment must be included up front and early

T&E in Support of Systems Engineering

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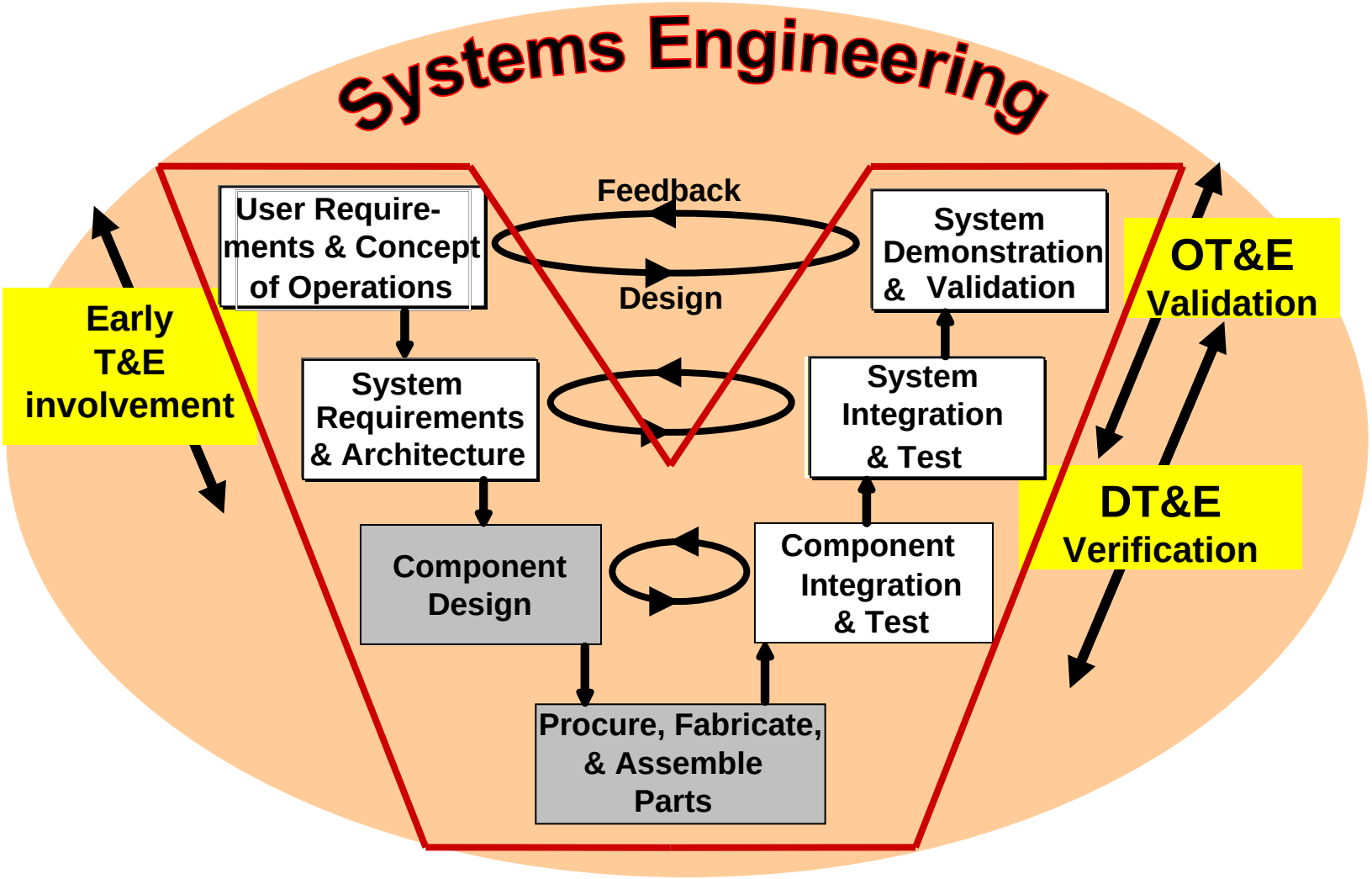
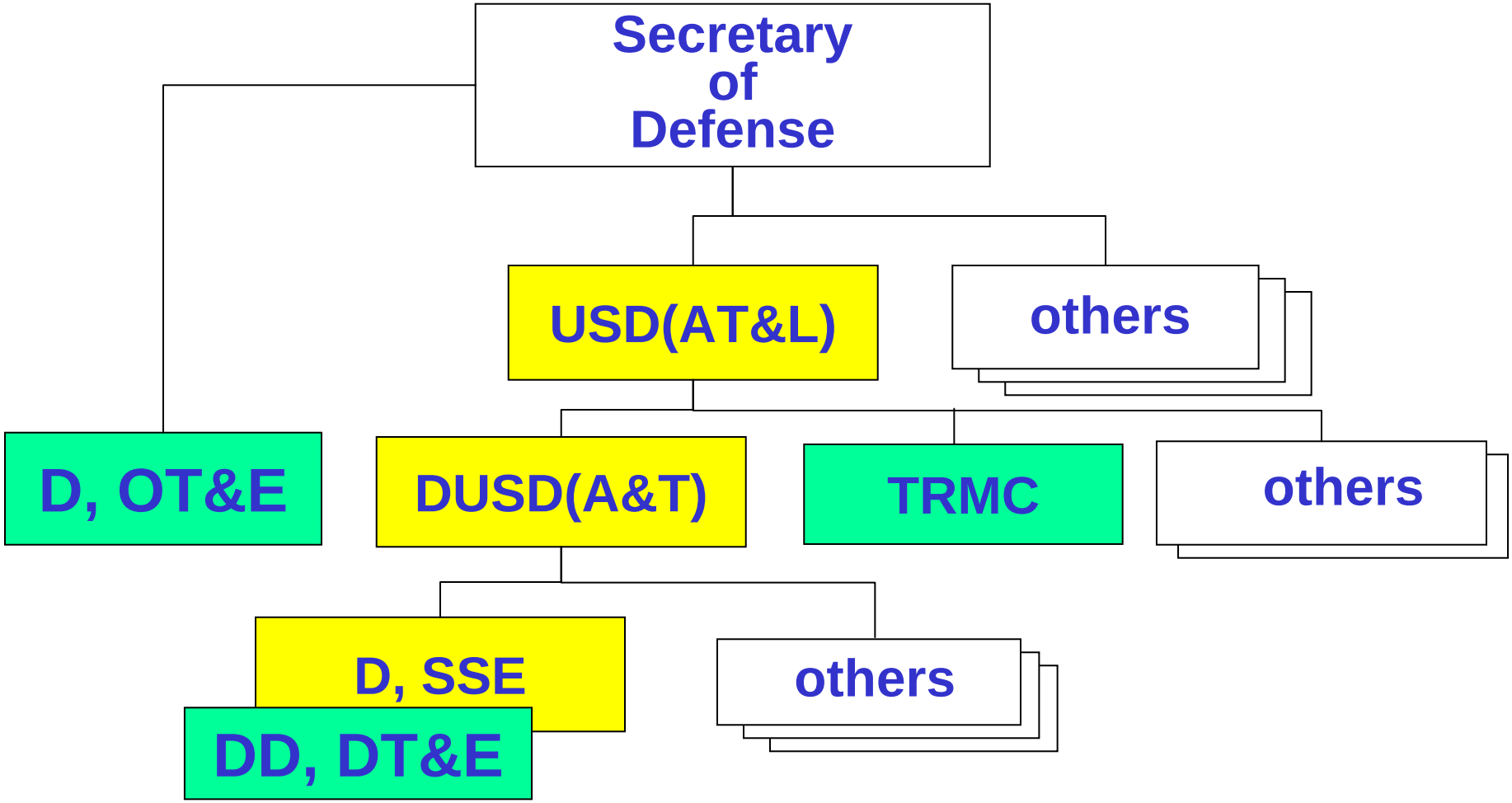


Where am I in OSD?



Our Mission

- Lead office within the DoD for all matters pertaining to developmental test and evaluation
  - Develops OSD policy concerning DT&E
  - OSD advocate for testers concerning DT&E
  - Responsible for education/training of the T&E acquisition workforce
- Office of primary responsibility for DoD Energy acquisition policy
  - Emerging area of emphasis on new weapon system development
- Lead office for acquisition M&S and System Safety

The Direction We are Heading

- Revitalizing DT&E
  - Department initiative to place more emphasis on government DT&E during system development
- Integrated Test policy
  - Standardizing definitions and execution guidance throughout the Services and OSD
- Testing in a Joint Environment
  - Several ongoing initiatives (JTEM, L-V-C, DMO, etc)

The Need to Revitalize DT&E

- Too many acquisition programs not operationally effective or suitable
  - Several reasons postulated as cause – reduction in governmental DT&E?
- Policy has languished concerning governmental involvement during system development
- DT data typically not relevant to the evaluation of a system's operational readiness
  - Scope is concentrated on more technical parameters
- DT focused on single system development
  - Needs wider emphasis on system of system and/or system employment in a joint context

A New Vector for DT&E

- Support Faster Fielding of Improved Capabilities
- Reduce Risk of Immature Technology in Systems Development
- Revitalize T&E Workforce Education
- Promote Joint T&E in Live-Virtual-Constructive Environments
- Provide Effective Acquisition Policy and Practices for DT&E

Support Faster Fielding of Improved Capabilities

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Objective: Develop T&E policy, practices, and procedures to support Departmental efforts in shortening the time to field capabilities

- Issues:
  - Not pass-fail; but based on capabilities and limitations
  - Integrate T&E strategy - CT, DT, OT
  - Incorporate operational context in DT
  - Collect once, and use data often – Integrated Testing
  - Ensure testable requirements are in EoA / CD
  - Ensure T&E requirements are in SOWs and RFPs
  - Ensure T&E documents consistent with and support:
    - Systems Engineering Plan (SEP)
    - Acquisition Strategy (AS)
    - Capability Documents (ICD, CDD, and CPD)

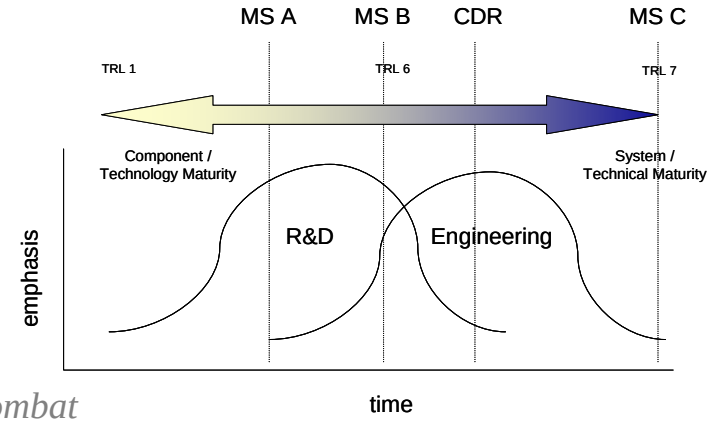
Reduce Risk of Immature Technology in Systems Development

Objective:

- Add Technology Maturity focus into the Systems Engineering and DT&E processes to:
  - Reduce technical, cost, and schedule risk
  - Increase the rigor of SE
  - Plan for alternatives in the event of TM difficulty
  - Verify TRLs during DT&E

Scope

- Leverage existing acquisition review structure
- Use existing DDR&E Technology Readiness Assessment (TRA) methodology

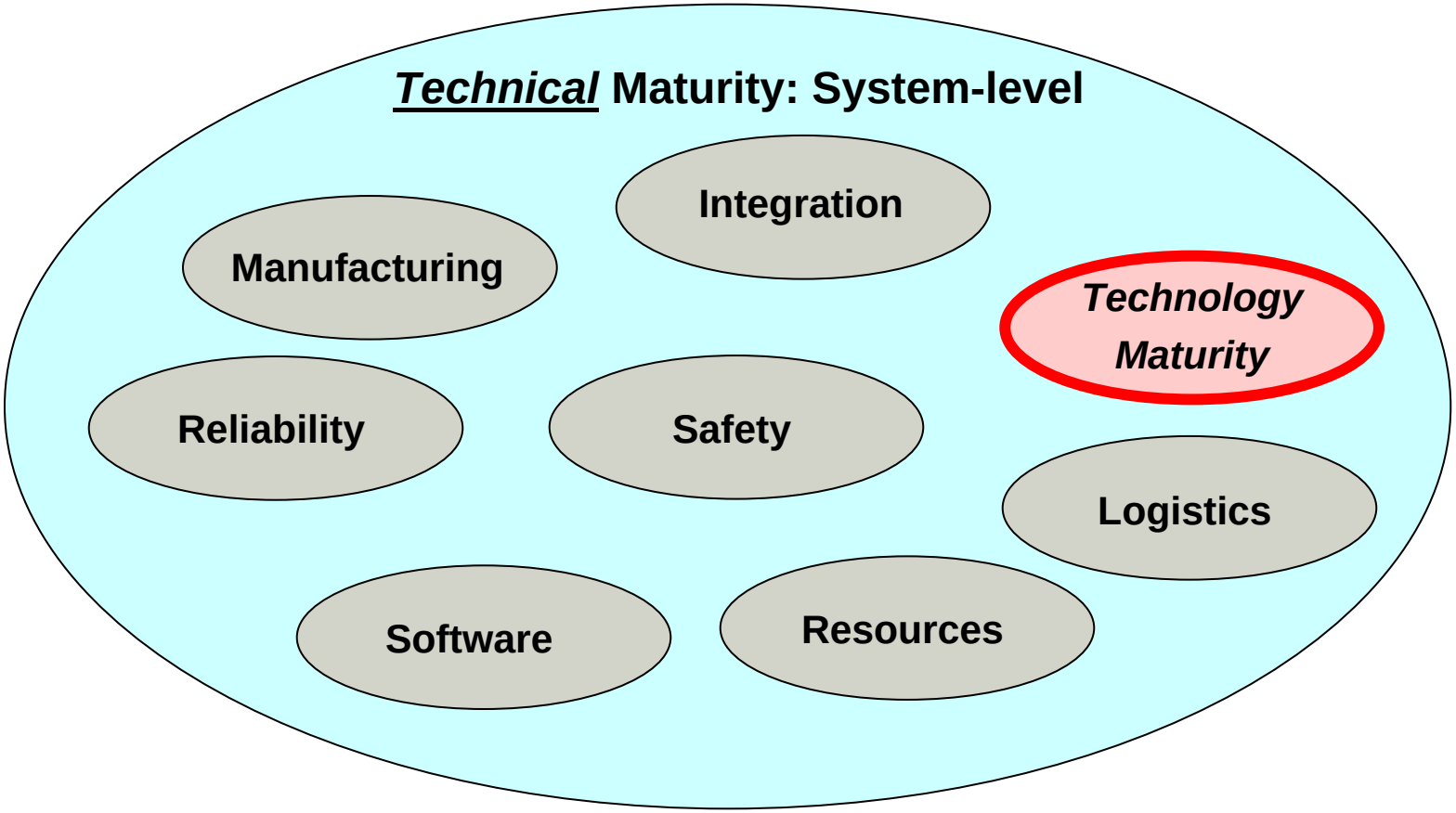


Reduce Risk of Immature Technology in Systems Development

Issues:

- Studies find that immature technology is a primary source of cost and schedule risk
  - GAO -- DAPA
  - QDR -- SSE/AS Program Support Reviews
- "Programs that started development with immature technologies experienced an average acquisition unit cost increase of nearly 21 percent" (GAO-05-301, March 2005)
- FY06, PL 109-163, Section 801 requires USD(AT&L) certification, before Milestone B, that *"the technology in the program has been demonstrated in a relevant environment"*
  - Above wording equates to Technology Readiness Level (TRL) 6

Technology vs. Technical Maturity



Technology Maturity is a component- or subsystem-level issue

Increased TM emphasis in OSD Oversight

- Program Support Review (PSR)
  - ID Critical Technology components/sub-systems?
  - Current TRLs known?
  - ID Mature alternative components/sub-systems?
  - TRL monitoring, Alternative decision date?
- Assessment of Operational Test Readiness (AOTR)
  - TM verification results
  - DT&E performance results
  - IOT&E predictive analysis/M&S

Revitalize T&E Acquisition Workforce Education

Objective: Ensure the T&E acquisition workforce is of sufficient size and adequately trained to perform the T&E tasks required in today's and tomorrow's product/system acquisition process

Issues:

- Continue to ensure current & relevant education, experience, training requirements
- Track new DAU course releases
- Identify the T&E education requirements for SoS and FoS
- Champion the development of new CLMs - such as "M&S for T&E"

DT&E Acquisition Education & Training

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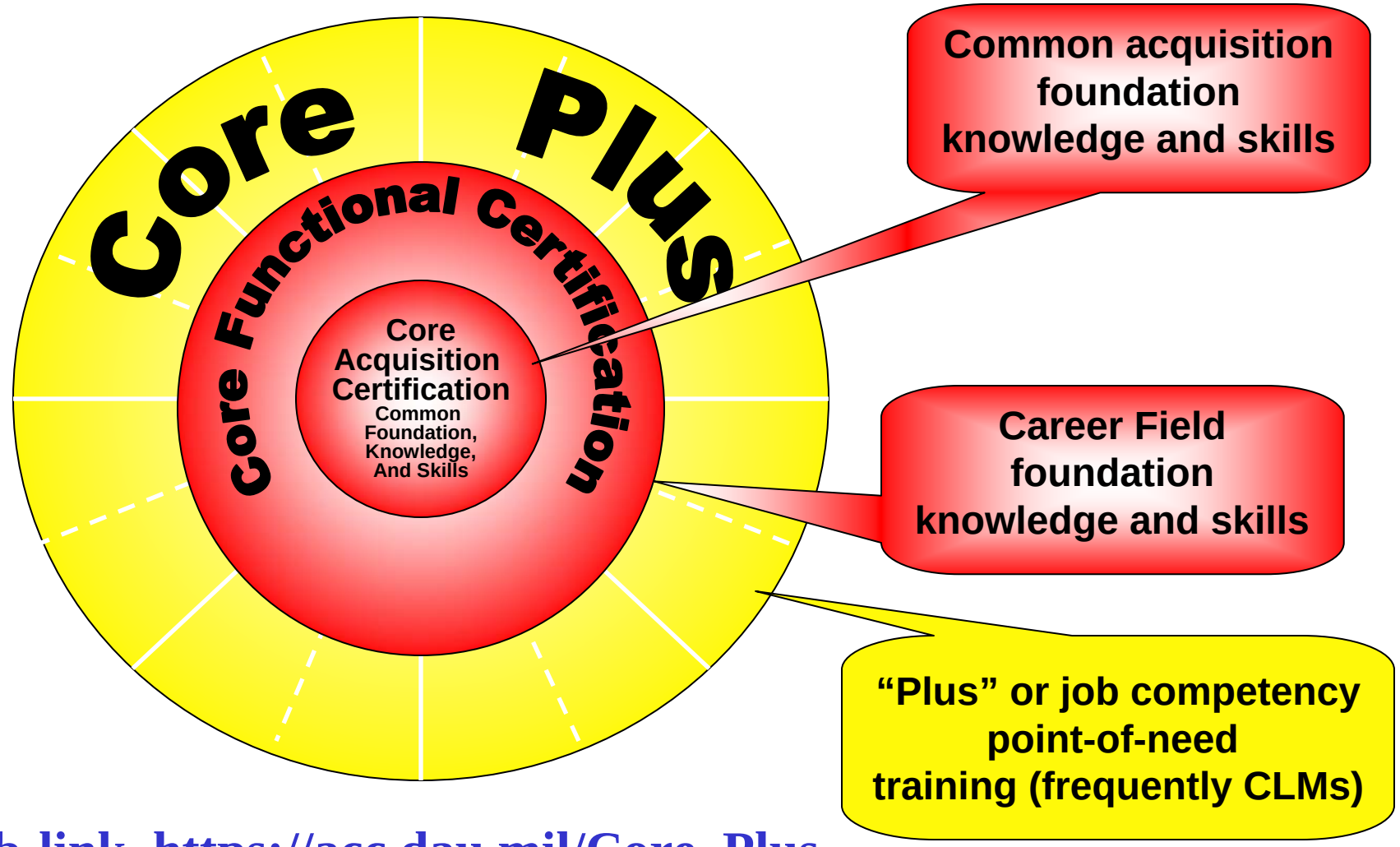

- **Web-link, https://acc.dau.mil/Core_Plus**

Promote Joint T&E in Live-Virtual-Constructive Environments

Objective: Define the role of DT&E in the joint T&E arena and partner with DOT&E, Joint Staff, and Components in defining and developing the necessary polices, practices, and procedures for the conduct of efficient and effective joint T&E

Issues:

- Establishing L-V-C standards
- Defining LVC environment functional requirements
- Identify capabilities & limitations of LVC architectures
- Map capabilities & limitations to requirements
- Compare middleware, business models, standards management, alternatives
- Create roadmap, and socialize it widely
- Define business processes
- Establish a Transition Plan to include: who pays, legacy implementation, etc.

Testing in a Joint Mission Environment

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- **Upcoming changes in OSD policy will likely:**
  - **Require testing in a joint environment for capabilities-based acquisitions**
  - **Establish governance on the use of the joint mission infrastructure**
  - **Enable smaller programs to participate and contribute to the joint environment**
  - **Increase demonstration venues for systems earlier in acquisition cycle**

Provide Effective Acquisition Policy and Practices for DT&E

Objective: Develop and socialize the necessary changes to DT&E policy, practices, and procedures to support the overall AT&L acquisition lifecycle management framework and process

Issues:

- More involvement in the Evaluation of Alternatives and Concept Decision
- Involvement in Capabilities design & SoS T&E
- Develop a format for T&E Strategy (TES)
- Reinforce Integrated T&E approach in TES / TEMP
- Enforce linkage of T&E and SE planning documents
- Incorporate Industry best practices
- Incorporate DT&E standards for:
  - Early involvement (requirements definition in Concept Refinement)
  - Increased operational perspective, operator involvement
  - System sustainment issues
  - Open processes and data availability
  - M&S part of T&E strategy; live test data used to improve M&S

2007 NDIA SE/DT&E Committee Focus

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- Three Focus Teams:
  - Earlier contractor and tester involvement
  - Integrated DT/OT and DT operational relevance (combined)
  - Suitability
- Recommend policy changes
  - Input to FY2008 DoD 5000 update

Summary

New Approaches to Acquisition:

- Emphasis on evolutionary acquisition
- Joint capabilities focus
- Net Centricity
- System-of-Systems
- Testing in a joint mission environment

Need a revitalized DT&E capability to be a productive team member

Back-up

T&E — A Key Part of SE Process