



An Enhanced Analysis of Alternatives (AoA)

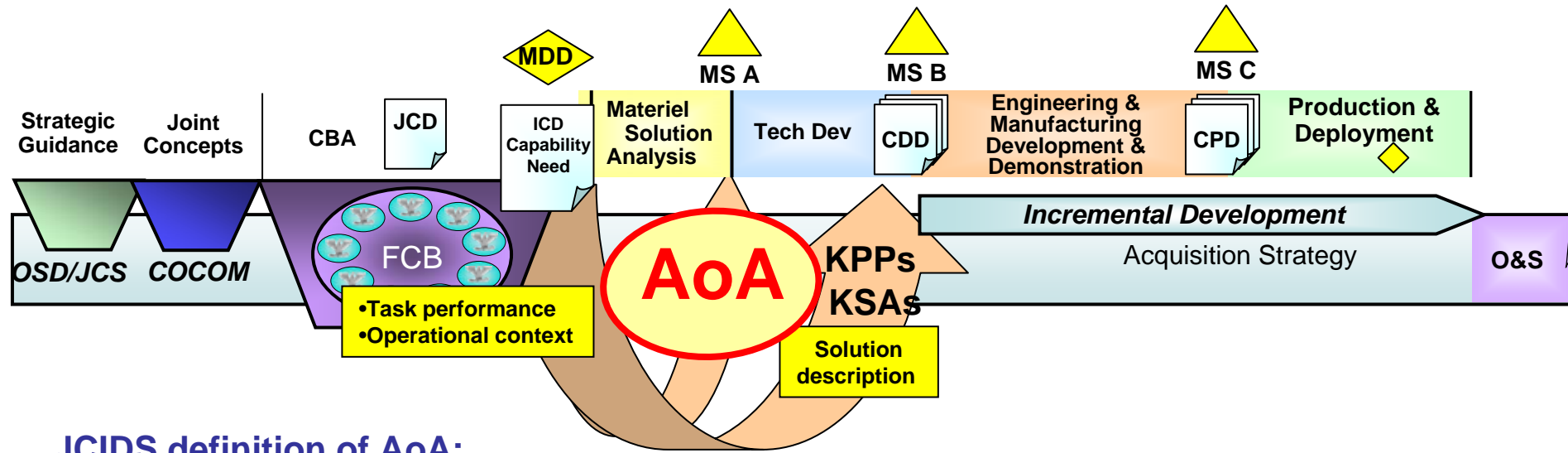
A Mission-Oriented, Evaluation-Based Framework for Defense Test & Evaluation

NDIA

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Role of the Analysis of Alternatives (AoA)

Analysis of Alternatives (AoA)
 Translates tasks to be performed in an operational context into a system “solution” for acquisition

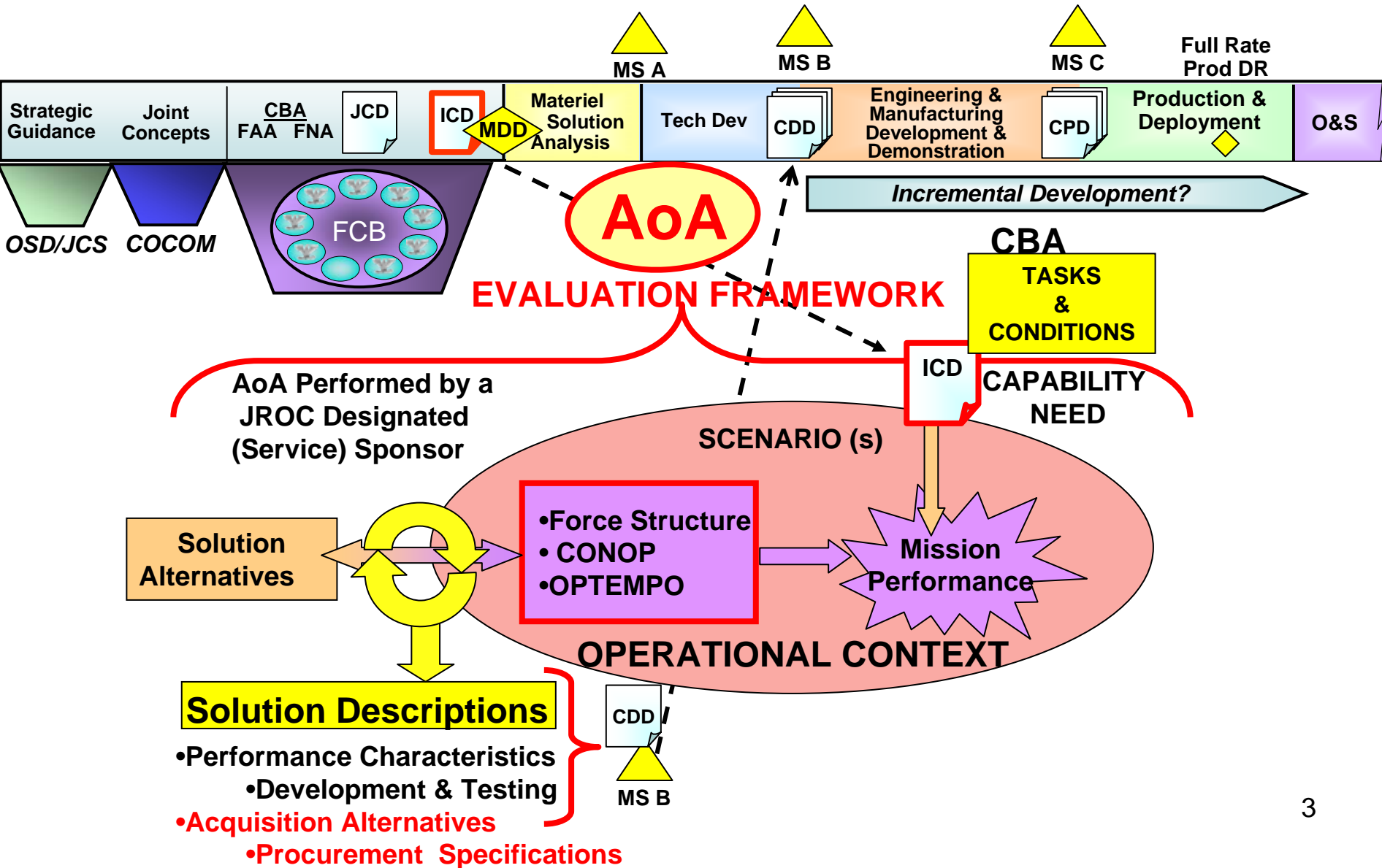


JCIDS definition of AoA:

*“The **evaluation** of the performance, operational effectiveness, operational suitability, and estimated costs of alternative systems to meet a mission capability.**The AoA is one of the key inputs to defining the system capabilities in the Capability Development Document (CDD)**”*

Insights Needed to Build a TEMP

AoA Methodology



A Review of AoAs

- **Reviewed AoAs**
 - AoAs Done Between 2003 and 2008 AND Done for DOT&E Oversight List Programs
- **Implications for T&E:**
 - Each Contains a Description of an **Operational Context** Potentially Useful to T&E Planning
 - Scenario, Forces, Objectives CONOPS, Climate, OPTEMPO, etc
 - Each includes a **“Sensitivity Analysis”** (SA) Relating System Performance to Mission Accomplishment

HOWEVER: SAs do NOT Relate Variations in System Characteristics Performance to Mission Effectiveness

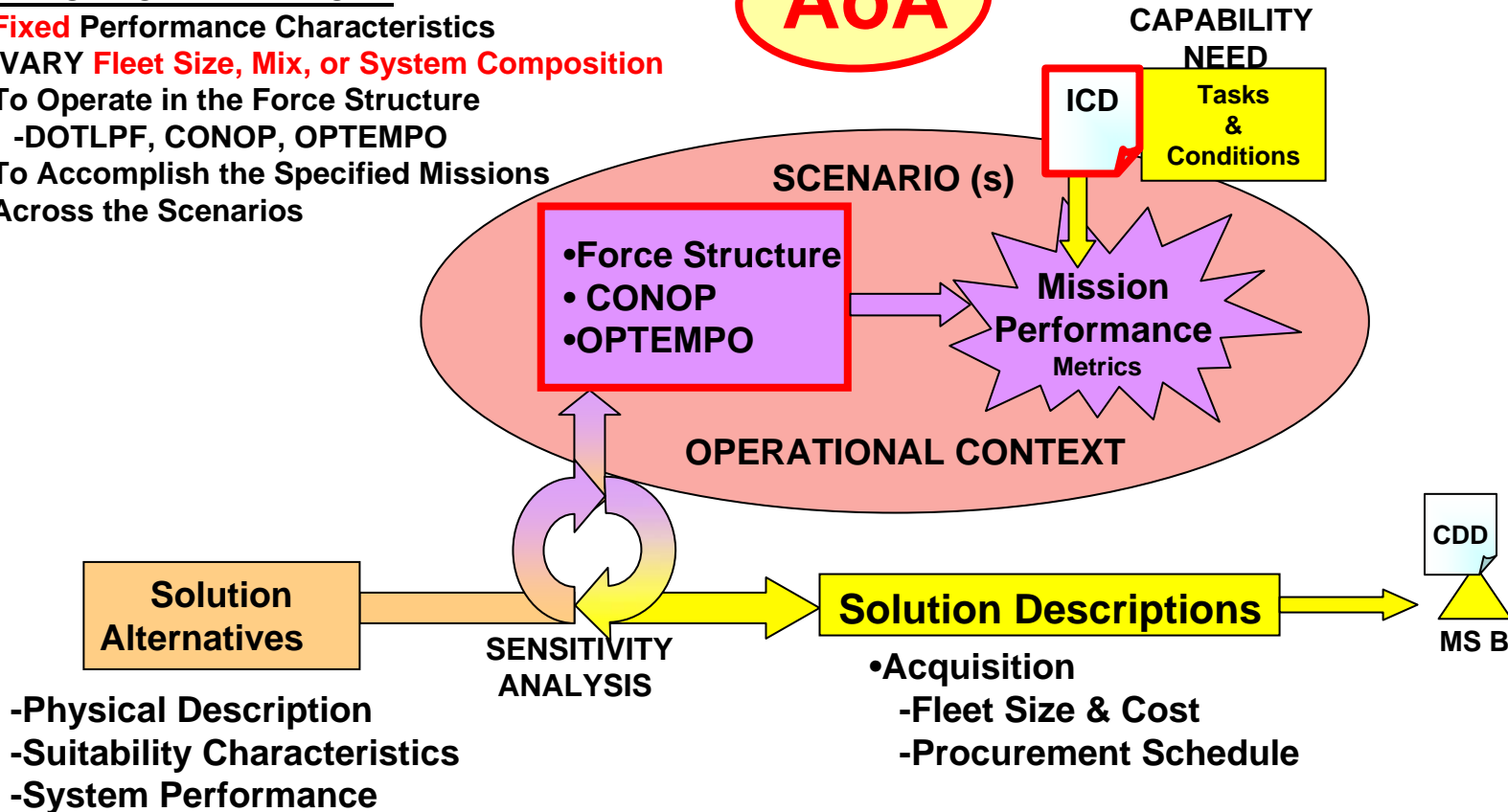
 - SAs Treat Performance Characteristics as “Fixed”;
 - Used to Derive System Fleet Size or System Configurations of Fixed Components for “Mission Accomplishment” Across Varied Scenarios
 - **AoA Informs a System Acquisition Strategy**
 - » A “Packing Algorithm” Paradigm: “How Many “Systems as Defined” are Needed, When, for Mission Success and at What Cost
 - **AoA Does NOT Recognize T&E as a Customer**
 - » T&E Examines System and Component Characteristics Performance relative to Mission Effectiveness measures

Analysis of Alternatives (AoA) Requirements-Based

EVALUATION FRAMEWORK

- **Fixed** Performance Characteristics
- VARY **Fleet Size, Mix, or System Composition**
- To Operate in the Force Structure
 - DOTLPF, CONOP, OPTEMPO
- To Accomplish the Specified Missions
- Across the Scenarios

AoA

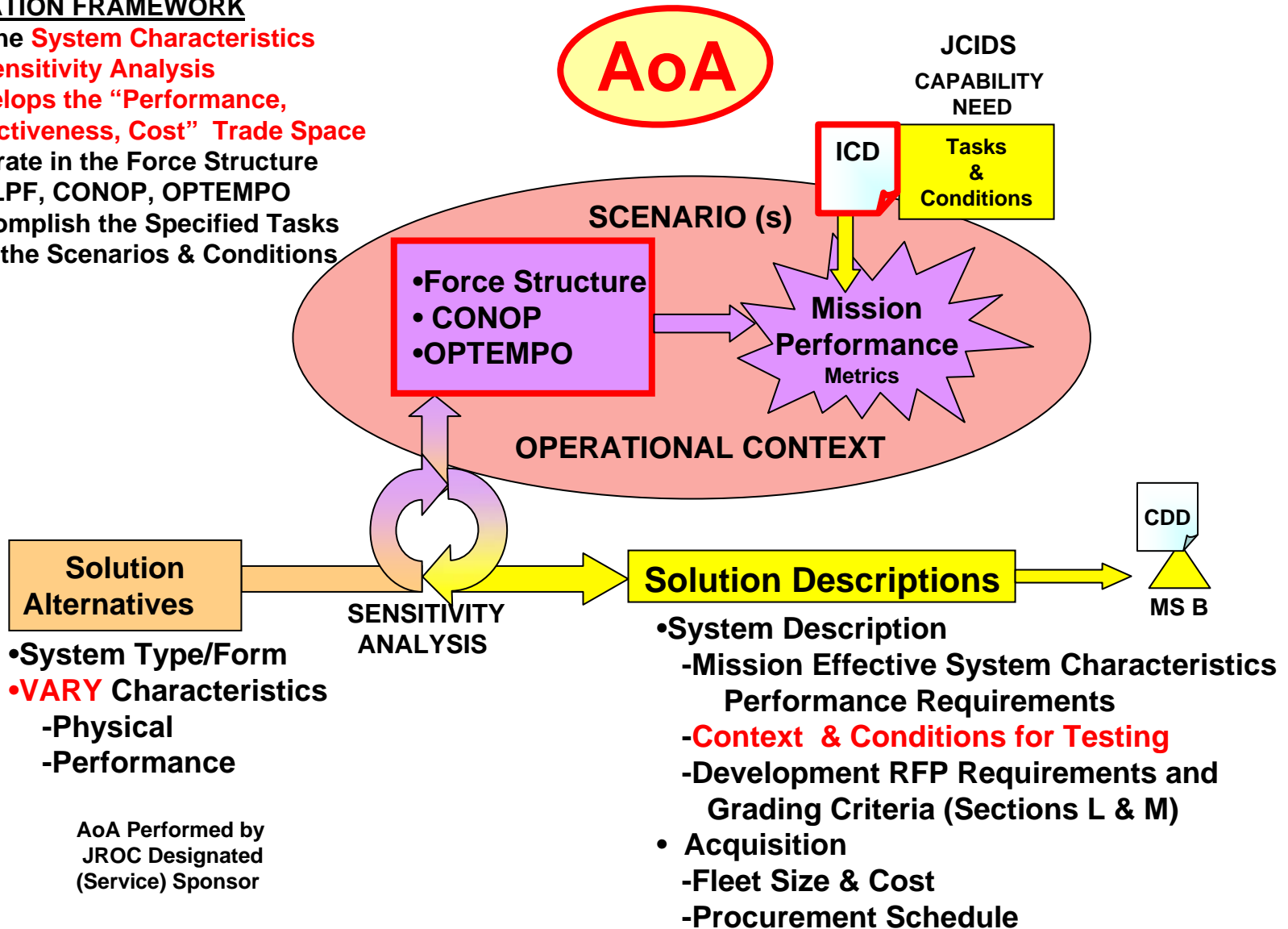


AoA Performed by
JROC Designated
(Service) Sponsor

An **Enhanced** Analysis of Alternatives (AoA) Capability-Based Sensitivity Analysis

EVALUATION FRAMEWORK

- **VARY** the **System Characteristics**
In the Sensitivity Analysis
 - Develops the “Performance, Effectiveness, Cost” Trade Space
- To Operate in the Force Structure
 - DOTLPF, CONOP, OPTEMPO
- To Accomplish the Specified Tasks
- Across the Scenarios & Conditions

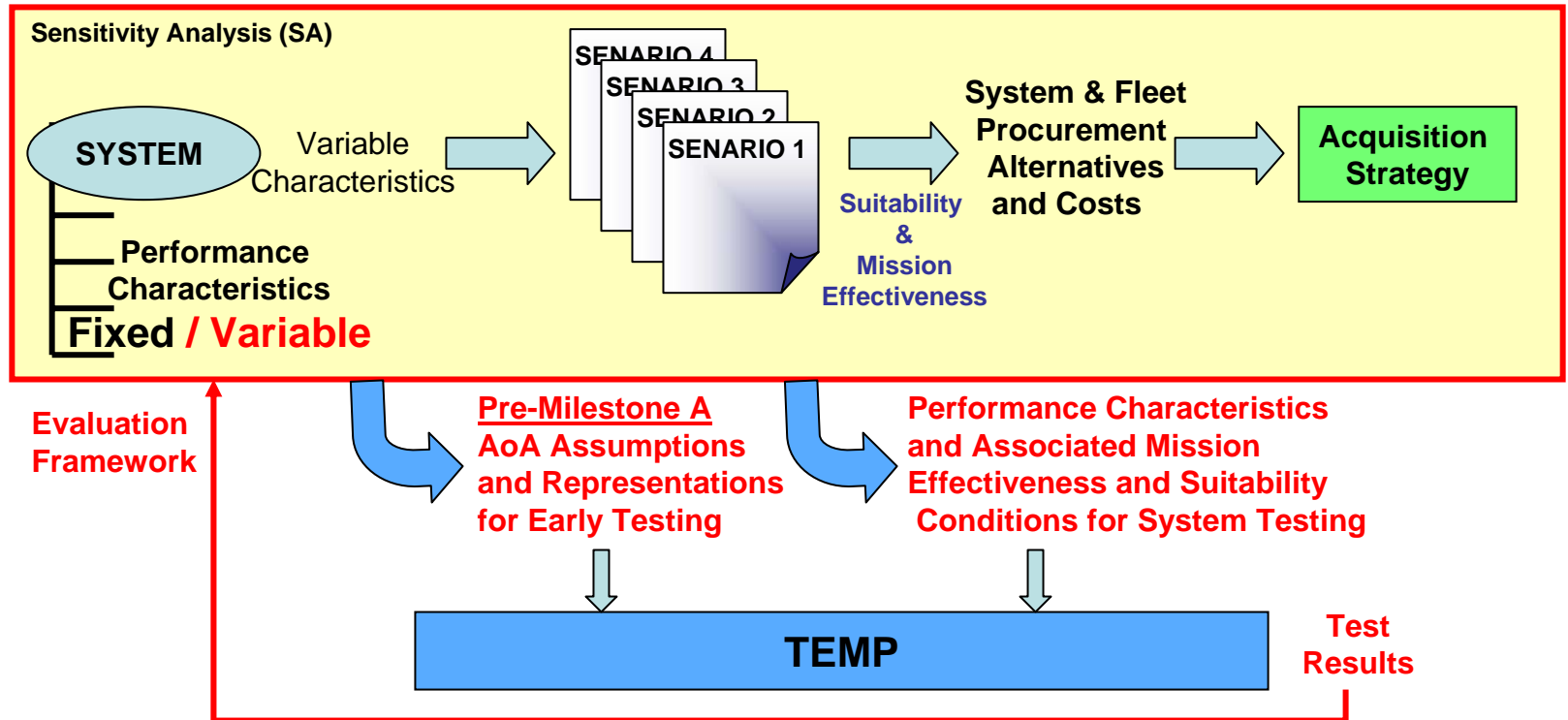




Enhanced AoA

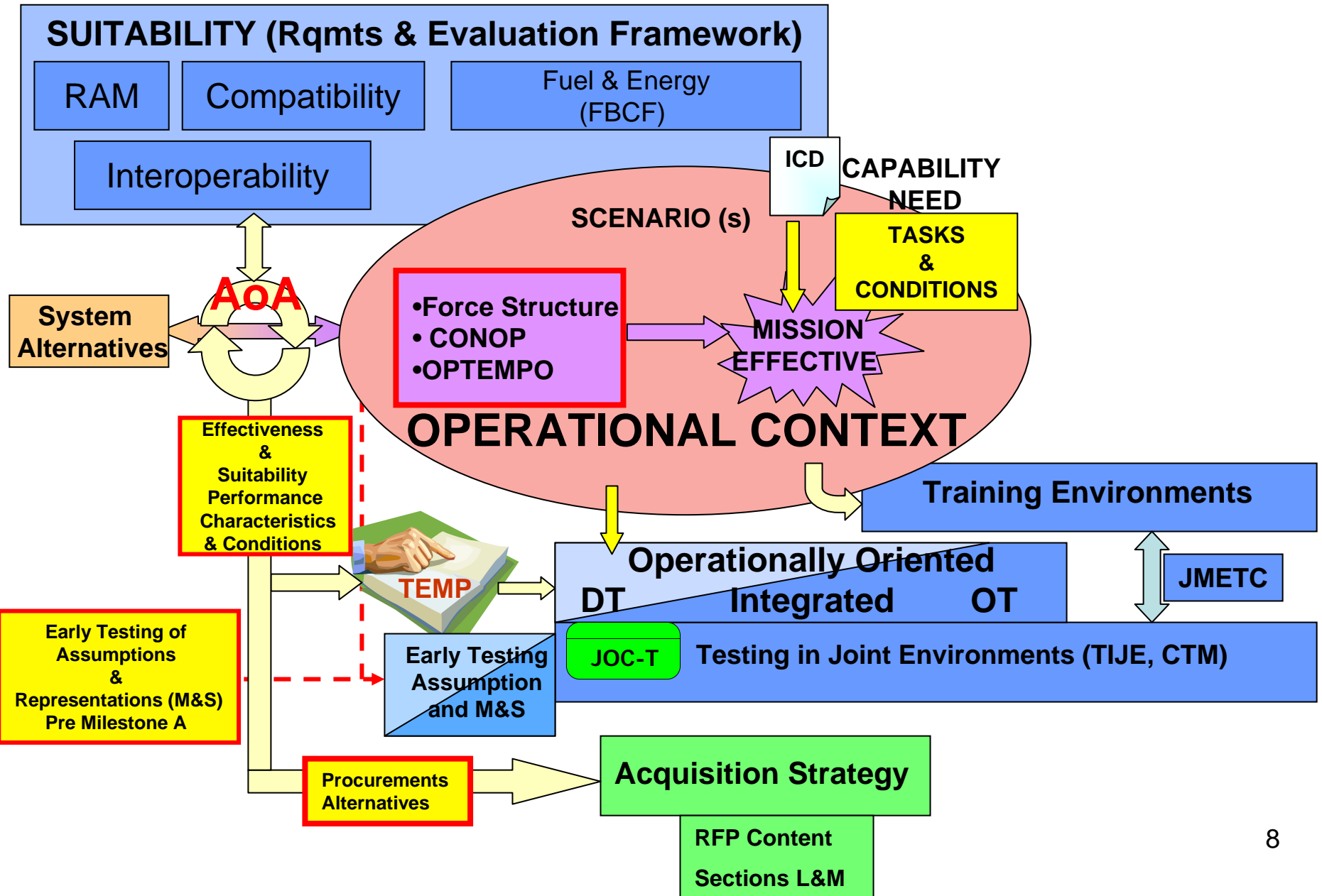
Treats System Performance Characteristics as Variables in the AoA / SA

Enhanced AoA





An Enhanced AoA an Integrating Process





T&E Benefits from an Enhanced AoA

- Enhanced Description of the Operational Context
 - For use in the AoA
 - For deriving operational environments for testing
 - For integrating development and operational test planning
- Consistent Validated Evaluation Framework
 - For systems design, testing, and assessment of system and mission cost / effectiveness
 - MDA better informed for Confidence in the System and for mitigating any performance deficiencies
- More Comprehensive and Effective Test Planning
 - Enhancing Confidence in the AoA
 - Early testing of key AoA assumptions and representations
 - Responsive to pre-Milestone A program reviews
 - Tasking and Resource Planning in the TEMP
 - » For M&S in the AoA
 - » For M&S supporting DT and OT events
 - Mission Oriented, Evaluation Based Test Planning
 - Testing integrated with the AoA
 - Testing focused on most important performance characteristics and conditions
 - Test results evaluated for mission effectiveness in the AoA analysis framework

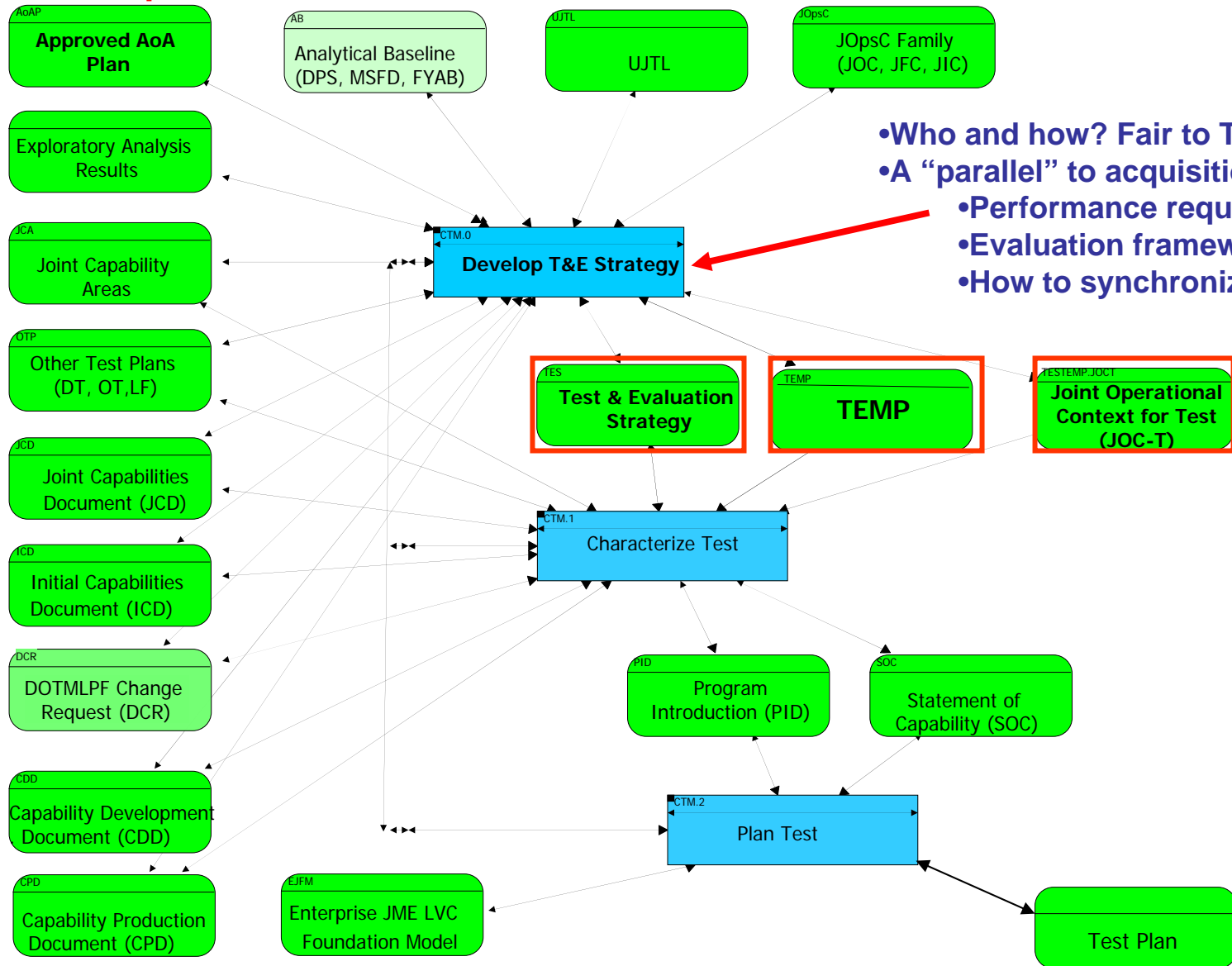
Harmonized Acquisition Milestone Decision Support

System Design, Cost / Effectiveness Evaluation, Acquisition Strategy, and Test Program



Benefits to T&E: Capability Test Method (CTM)

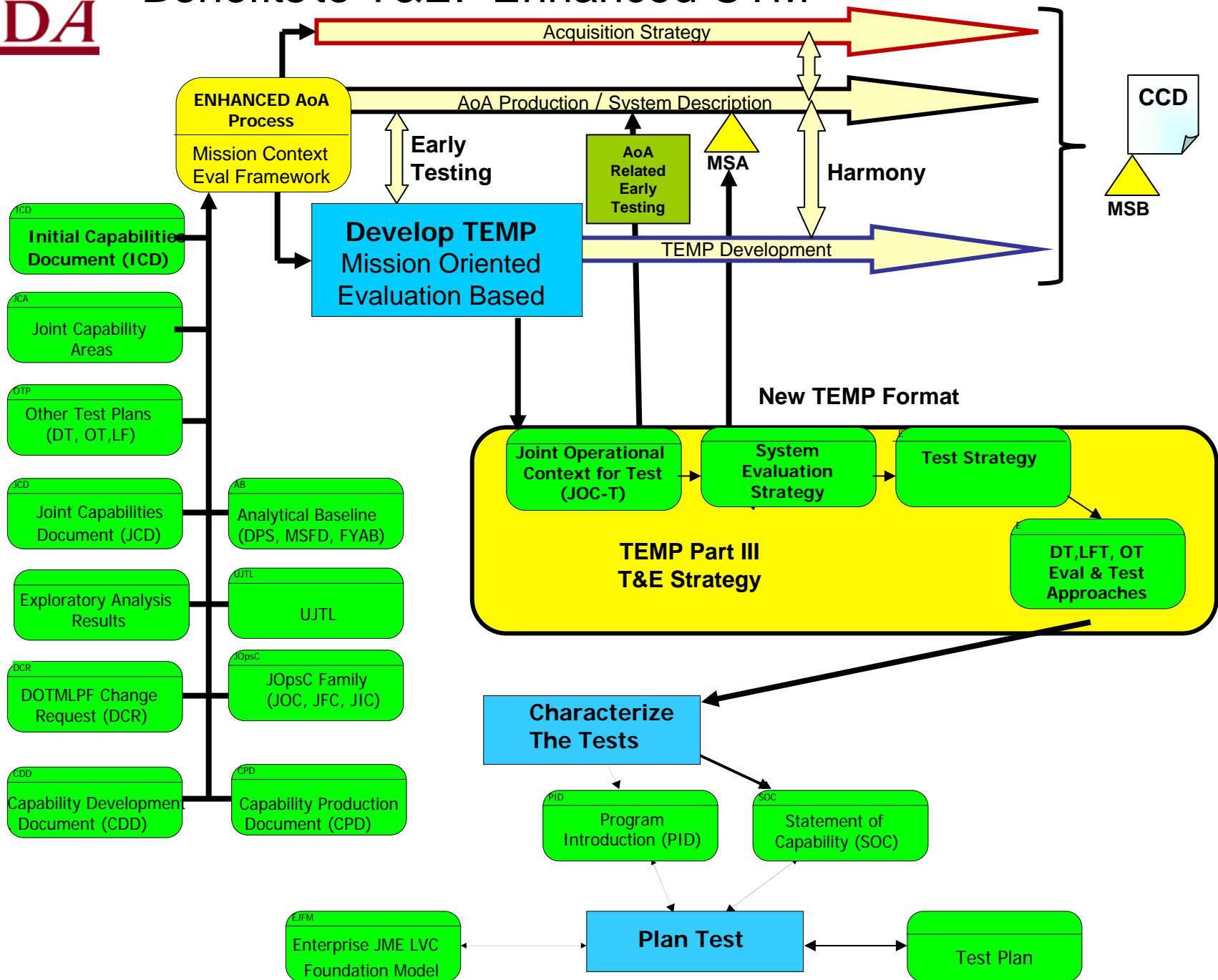
System Design → ACQ



- Who and how? Fair to T&E or others?
- A “parallel” to acquisition process?
- Performance requirements?
- Evaluation framework?
- How to synchronize?



Benefits to T&E: Enhanced CTM

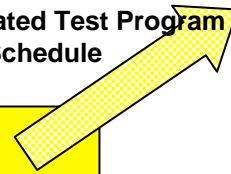




Benefits to T&E: An Emerging TEMP Format

Part I Introduction	Part II Test Program Management & Schedule	Part III Test & Evaluation Strategy	Part IV Resource Summary
Brief Purpose of TEMP Brief Mission Description Brief System Description -System Threat Assessment -Program Background -Key capabilities -Key Interfaces -Cert Rqmts -Sys Engr Rqmts	T&E Management Comment T&E Data Base Rqmts Deficiency Reporting TEMP Updates Integrated Test Program Schedule	<div style="background-color: yellow; padding: 5px;"> <ul style="list-style-type: none"> •System Evaluation Strategy (T&E Perspective, Relates to AoA, Explains Testing's Role in System/Mission Effectiveness Evaluation) <ul style="list-style-type: none"> - Joint Operational Context for Evaluations - Evaluation Approach <ul style="list-style-type: none"> -Mission Effectiveness Evaluations -Comparison to Current Capability -Test Support to Evaluations •Test Strategy (Testing's Approach to Supporting the Evaluation Strategy) <ul style="list-style-type: none"> -Joint Operational Context for Test (JOC-T) -DT & OT Objectives from Evaluation Strategy -Assumptions and M&S Validation Tests -Integrated DT & OT Planning Objectives </div> <div style="background-color: lightblue; padding: 5px; margin-top: 10px;"> <ul style="list-style-type: none"> •Developmental Evaluation Approach <ul style="list-style-type: none"> -Developmental Test Approach -M&S, Test Limitations •Live Fire Evaluation Approach <ul style="list-style-type: none"> -Test Objectives, M&S, Test Limitations •Certification for IOT&E •Operational Evaluation Approach <ul style="list-style-type: none"> -Operational Test Approach -M&S, Test Limitations •Other Certifications •Reliability Growth •Future T&E </div>	Introduction -Test Articles -Test Sites & Instrumentation -Test Support Equipment -Threat Representations -Test Targets & Expendables -OPFOR Test Support -M&S and Test-beds -Joint Operational Test Environment -Special Requirements Federal, state, Local Rqmts Manpower/ Personnel Training Test Funding Summary

- AoA Overview (T&E Perspective)
 - Operational Context of Evaluations
 - AoA System/Mission Evaluation Approach
- Acquisition Strategy Overview
 - Milestone Information Needs
 - System Maturity Schedule



**Describing a
Mission-Oriented,
Evaluation-Based
Test Program**