



Joint Test and Evaluation Methodology (JTEM)



JTEM Overview

National Defense Industrial Association Modeling & Simulation Committee Meeting

June 23, 2008

Colonel Eileen Bjorkman

Joint Test Director

eileen.bjorkman@jte.osd.mil

757.638.6099



Overview



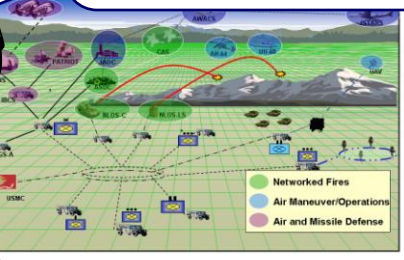
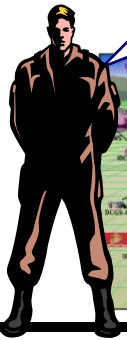
- Background/Problem Statement
- Capability Test Methodology
- The Joint Mission Environment
- Schedule
- Test Event 2 (JBD2)
- Products



Why Test in a Joint Environment?



Hey, this stuff passed its interoperability certs!
How come it doesn't work in the AOR?



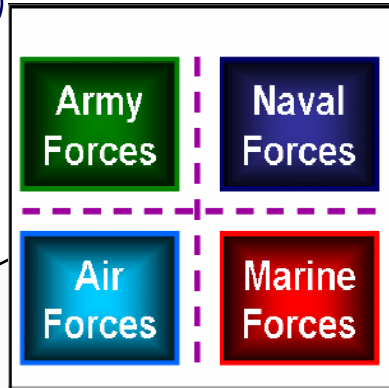
Single Service Operational Test in a Realistic Environment

"OT&E shall determine the operational effectiveness and suitability of a system under realistic operational conditions, including combat."

DoDI 5000.2, E.7
[May 2003]



Deconflicted



Coordinated

Test like we fight

jtem@jte.osd.mil

ENABLING THE JOINT FORCE

Interoperability Test/Certification

"... any resultant materiel solution will be verified through testing in the expected joint operational environment to demonstrate joint interoperability ..."

CJCSI 3170.01F, B.3
[May 2007]

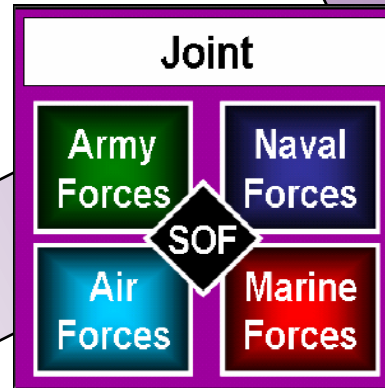
It is a requirement . . .

Test in a Joint Environment across the Acquisition Life Cycle

"Systems that provide capabilities for joint missions shall be tested in the expected joint operational environment ."

DoDI 5000.2, E.5
[Draft, August 2007]

JOINT CAPABLE FORCES



Integrated

Interdependent



It is the right thing to do . . .

- Early discovery of problems, reduced rework costs
- Improved test data for milestone decision authorities
- Improved system characterization and limitations for Service and combatant commander planning
- Field proven joint capabilities to the combatant commander



Background: Testing in a Joint Environment Roadmap



Transformation Planning Guidance

- Joint “concept-centric” approach for capability development
- Integrated architectures define parameters of joint capabilities
- Need to test capabilities and architectures in a realistic joint environment

Signed April 2003

Strategic Planning Guidance

- Need realistic T&E in a joint operational context
- Directed DOT&E to develop a roadmap to identify changes necessary to ensure T&E is conducted in a joint environment to enhance fielding of joint capabilities

Signed March 2004

Testing in a Joint Environment Roadmap

- Build Joint Mission Environment from mission requirements defined by JCIDS
- Required for entire acquisition process, not additional test
- Defines infrastructure required:
 - Network connectivity
 - Service environments
 - Program-specific

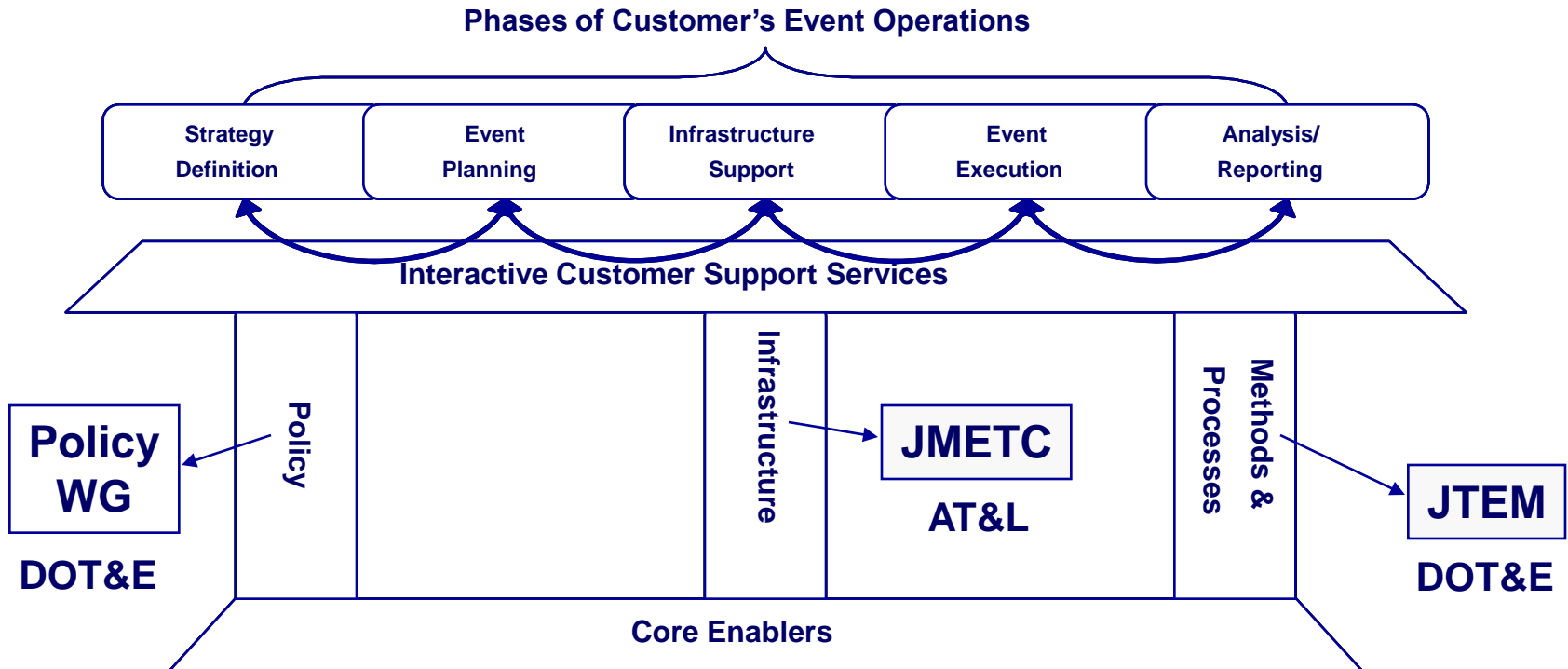
Signed November 2004

Recognized need for T&E Transformation

DOT&E – Director, Operational Test and Evaluation
JCIDS – Joint Capabilities Integration and Development System
T&E – Test and Evaluation



Background: JTEM Role in the Roadmap Implementation



Methods & Processes Working Group Issues delineated in Implementation Plan form basis for JTEM methodology

AT&L – Acquisition Technology and Logistics
JMETC – Joint Mission Environment Test Capability
WG – Working Group

DOT&E – Director, Operational Test and Evaluation
JTEM – Joint Test and Evaluation Methodology



Background: JTEM Problem Statement



Processes and methods for designing and executing tests of systems of systems in the joint mission environment are not well defined or understood. Nor is there a clear understanding of how to assess system performance as it pertains to capabilities supporting joint missions.

Overall Goal: Recommended Best Practices for a consistent approach to describing, building, and using an appropriate representation of a particular Joint Mission Environment across the acquisition lifecycle.



What is the Capability Test Methodology (CTM)?

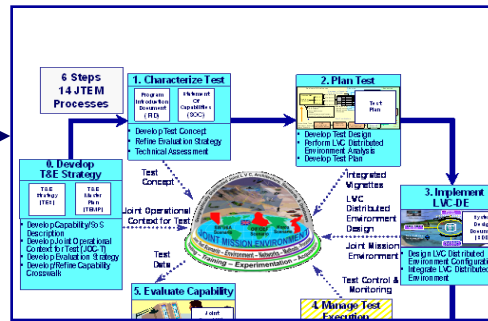
“Systems that provide capabilities for joint missions shall be tested in the expected joint operational environment .”

DoDI 5000.2, E.5 [Draft, August 2007]

The CTM answers all these questions . . .

The CTM: A rational process that leads the PM and test manager through the test planning process to tailor and optimize a test to demonstrate joint capabilities. CTM provides the following planning tools:

- Templates/checklists:
 - TES/TEMP
 - PID/SOC
 - Environment design
 - Joint capability evaluation
- Handbooks:
 - PM/CM/action officer
 - Analysis Guidebook



. . . and more!

Program Manager Questions

- What does this mean?
- Who does this testing?
- Is this the same thing as interoperability testing?
- What is the joint operational environment for my system?
- How do I design an affordable test?
- How do I communicate my requirements to a test range?



Test Range/Evaluator Questions

- How do I evaluate joint mission effectiveness?
- How do I design and build a test environment that meets requirements?
- What is the difference between DT and OT in a joint environment?
- How do I validate a joint environment?
- How do I work with other ranges and simulation facilities?

The Capability Test Methodology:

1. Tests both systems and capabilities, Service or joint
2. Augments existing DOD and Service test processes—tailor to need
3. Aligns T&E aspects and information across multiple DOD processes, namely Analytic Agenda, JCIDS, DODAF, Defense Acquisition System
4. Provides recommended best practices for a consistent approach to describing, building, and using an appropriate representation of a particular joint mission environment across the acquisition life cycle
5. Reflects current acquisition policies and instructions and will be incorporated into DAU PM and T&E courses

Test like we fight





JTEM Capability Test Methodology (CTM) v2.0



**6 Steps
14 JTEM
Processes**

1. Characterize Test

Program Introduction Document (PID)	Statement of Capabilities (SOC)
-------------------------------------	---------------------------------

Capability Subset Focus

- Develop Test Concept
- Refine Evaluation Strategy
- Technical Assessment

2. Plan Test

Analysis & Evaluation	Planning	Execution
<ul style="list-style-type: none"> • Develop Test Design • Perform LVC Distributed Environment Analysis • Develop Test Plan 	<p>Test Plan</p>	

0. Develop T&E Strategy

T&E Strategy (TES)	T&E Master Plan (TEMP)
--------------------	------------------------

- Develop Capability/SoS Description
- Develop Joint Operational Context for Test (JOC-T)
- Develop Evaluation Strategy
- Develop/Refine Capability Crosswalk

Capability Set Focus

3. Implement LVC-DE

	System Design Document (SDD)
--	------------------------------

- Design LVC Distributed Environment Configuration
- Integrate LVC Distributed Environment

5. Evaluate Capability

	Joint Capability Evaluation (JCE)
--	-----------------------------------

- Analyze Data
- Evaluate SoS Performance & Joint Mission Effectiveness

4. Manage Test Execution

	Event Management Plan
--	-----------------------



LVC – Live, Virtual, Constructive
 LVC-DE – Live, Virtual, Constructive Distributed Environment
 SoS – System of Systems



CTM v2.0 Alignment with DOD T&E Process



1. Characterize Test

Program Introduction Document (PID)	Statement Of Capabilities (SOC)
-------------------------------------	---------------------------------

- Develop Test Concept
- Refine Evaluation Strategy
- Technical Assessment

2. Plan Test

Analysis & Evaluation	Planning	Execution
-----------------------	----------	-----------

Test Plan

- Develop Test Design
- Perform LVC Distributed Environment Analysis
- Develop Test Plan

0. Develop T&E Strategy

T&E Strategy (TES)	T&E Master Plan (TEMP)
--------------------	------------------------

- Develop Capability/SoS Description
- Develop Joint Operational Context for Test (JOC-T)
- Develop Evaluation Strategy
- Develop/Refine Capability Crosswalk

3. Implement LVC-DE

	System Design Document (SDD)
--	------------------------------

- Design LVC Distributed Environment Configuration
- Integrate LVC Distributed Environment

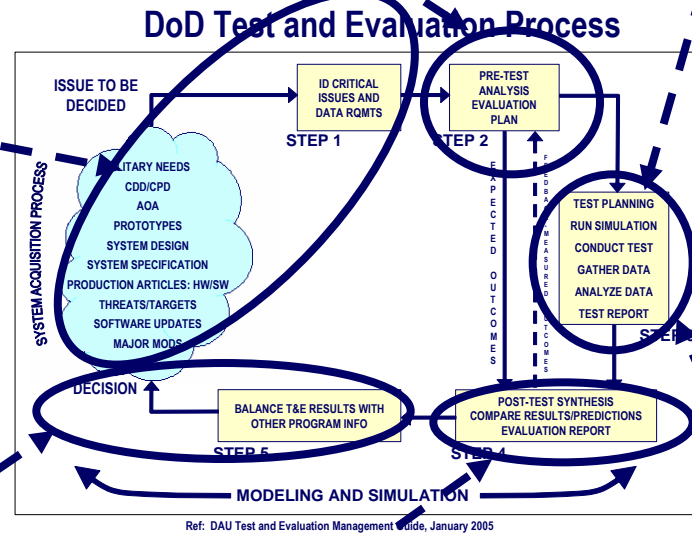
5. Evaluate Capability

	Joint Capability Evaluation (JCE)
--	-----------------------------------

- Analyze Data
- Evaluate SoS Performance & Joint Mission Effectiveness

4. Manage Test Execution

	Event Management Plan
--	-----------------------



Program Decisions



What is the Joint Mission Environment?

OSD/JS J7

Analytic Agenda
DPS, MSFD, FYAB

JOpsC Family
JOC, JFC, JIC

JS J8/J7
"Capability Lead"

JCIDS
JCD, ICD, CDD, JCIDS DoDAF Views (e.g., OVs, SVs)
AOA

USJFCOM J8/J7

JCAs
UJTL/Service Task Lists

AT&L/
Service/Joint Acq Programs

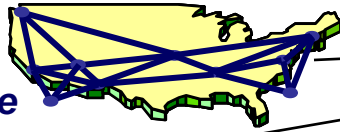
TES/TEMP
STAR

JTEM **Methods and Processes**



JMETC

Infrastructure



Components



USN/MC Co
Sea Environment
Air Component
Surface Component
Subsurface Component
CONOPS
Link Models
C2/ISR
Space

AF-ICE CORE
USAF Air Component
USAF C2/ISR
USAF Weapon
USAF Link Model
USAF CONOPS
IADS Tools
Space

Threat Systems
NASIC, MSIC, ATSO, NGIC, etc...

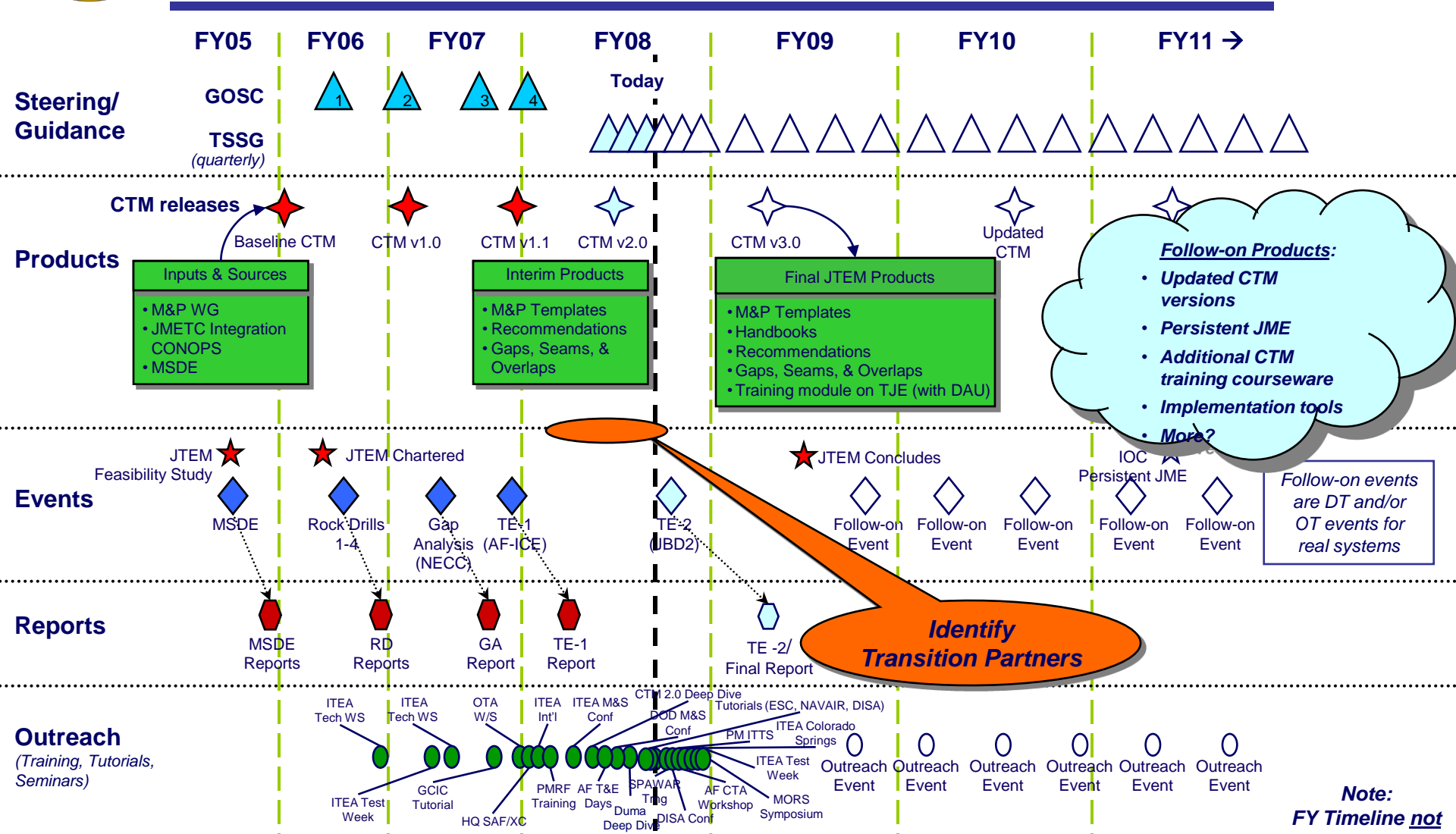
USA 3CE CORE
USA Ground Environment
USA BMC2
USA Platforms
USA CONOPS
USA Link Models
USA Air Components
USA Weapons

Common CORE Tools
InterTEC
Stealth Viewer

Common Joint CORE
FDCE
JSIC
JITC



JTEM Schedule



AF-ICE – Air Force-Integrated Collaborative Environment
GCIC – Global Cyberspace Integration Center
GOSC – General Officer Steering Committee
ITEA – International T&E Assn.
JBD2 – Joint Battlespace Dynamic Deconification
JMETC – Joint Mission Environment Test Capability
LVC – Live, Virtual, Constructive
M&P – Methods and Processes
M&P WG – M&P Working Group
M&S – Modeling and Simulation
MSDE – Multi-Service Distributed Event
NECC – Net-Enabled Command Capability
PMRF – Pacific Missile Range Facility
TSSG – Testing in a Joint Environment Roadmap Senior Steering Group

Note:
FY Timeline not to scale



TE 2 Sites & Systems



JBD2 JTEM 08 Test Sites Utilize:

- JMETC Provided Network Infrastructure
- LVC Operational Capability Layer
- LVC Test Resource Layer
- FCS Funded Terrain Databases
- AETF LDIF
- SO-1 Lessons Learned and SW fixes

Common Systems to All Sites:

- ASTi
- DCARS (RICS)2
- Test Talk
- SIMDIS
- IVT
- VOIP
- Gateway Builder

EPG, Ft Lewis

- RPWS
- DCARS
- DAUVS

ACCN, Aberdeen

- AFATDS
- FBCB2
- RPWS
- JTAC
- OneSAF
- CL 1 UAS

WARCAP, Pentagon

- TAIS
- Viewing Portal

ACETEF, Pax River

- F/A -18 (2)
- NGTS

GCIC, Langley AFB

- GCCS-J
- TBMCS

SIMAF, WP AFB

- AWACS
- JTAC
- F-16 (4)
- Reaper (MQ-9)

JSIC, Suffolk

- GCCS-J (CTP)
- JNTC, Suffolk
- JDAS/DCARS

System Key:

- Live
- Virtual
- Constructive
- Test Resources

Site Key:

- Army
- Air Force
- Navy
- Marines
- Joint

WDTC

- 4DWX
- (Safari to DTCC)

WSMR WCCN

- AFATDS
- RPWS
- OneSAF

IRCC

- JTAC
- Data Storage

OTC, Ft Hood

- FBCB2
- Live Vehicles (5)
- IED Simulator
- ExCIS
- OT-TES

DTCC, GMAN & AMRDEC Redstone Arsenal

- AFATDS
- GCCS-A
- TAIS
- RPWS
- DAUVS
- TAIS
- OneSAF
- NLOS-LS

46TS, Eglin AFB

- TBMCS
- TACP-CASS
- JTAC

GWEF, Eglin AFB

- F-15 (1)
- NEW
- SWARM

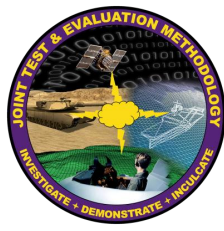
NCES, SPAWAR - C

- GCCS-M
- USMC, SPAWAR - C
- GCCS-J
- TBMCS
- AFATDS
- Strike Link (TLDHS)
- JTAC
- HIMARS
- Recon Vehicles (2)



TE 2

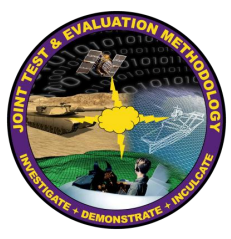
Other Service Initiatives



- USAF
 - SWARM Weaponized UAS (GWEF/Eglin AFB)
 - Kaleidoscope (GCIC/Langley AFB)
 - Net Enabled Weapon (NEW) (GWEF)
 - Command and Control Resource Management System (C2RMS) (GCIC)
 - Adobe Connect (GCIC)
- USN
 - JFMCC Cooperative Engagement Capability/Real Time Air Track Distribution (CEC/RTTS) (SPAWAR, Charleston)
 - SSE Gateway (ACETEF/Pax River)
- USA
 - JAMUS Data Collection (GMAN/Redstone Arsenal)
- USJFCOM
 - Top Common Operating Picture (CTP) (JSIC/Suffolk)
- OSD
 - Information Assurance / Computer Network Defense (IA/CND) (46th TS/Eglin AFB using JBD2 08 Test context)



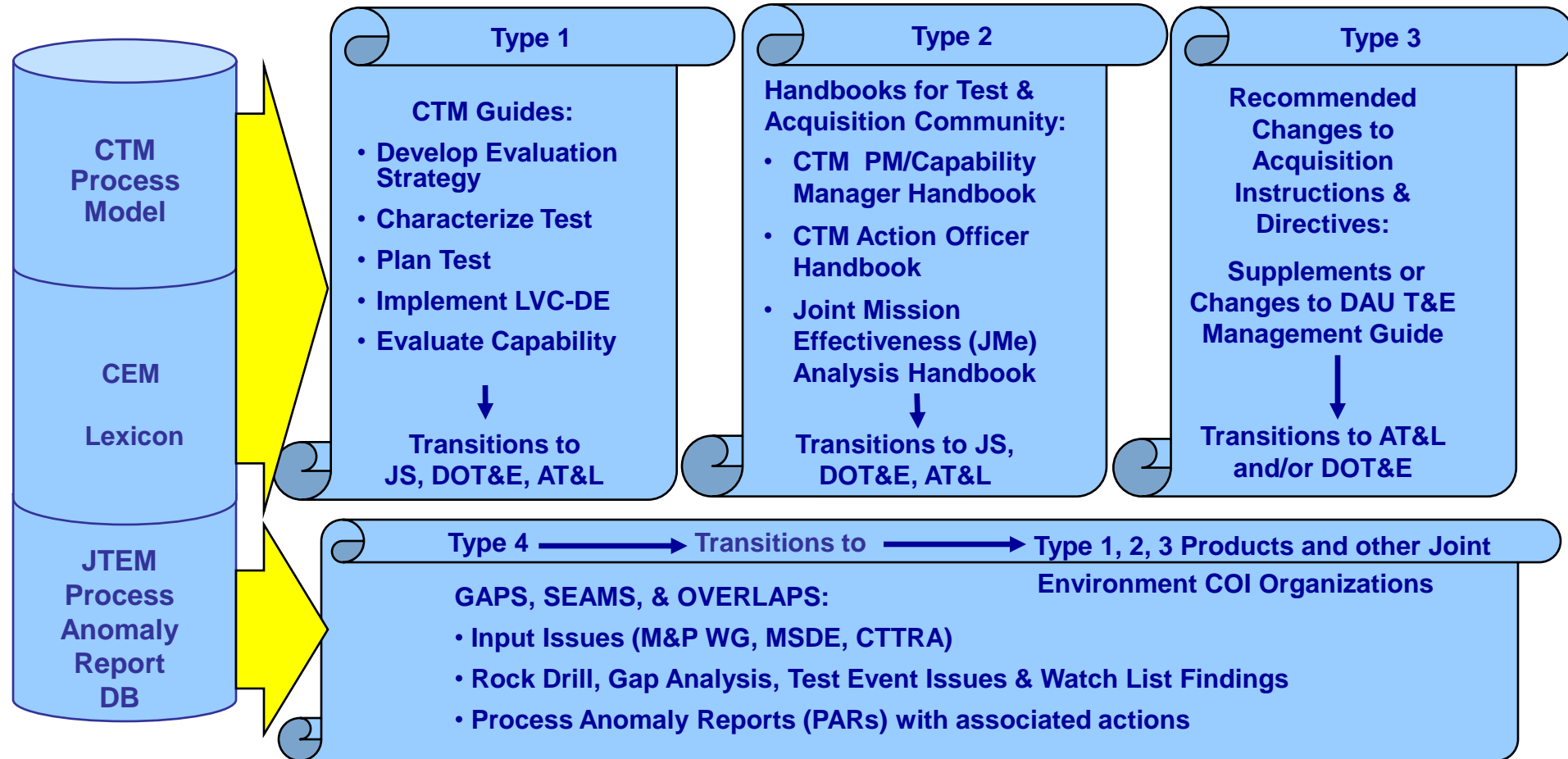
TE 2 Benefits to the Joint T&E Community



- Established processes and relationships for working with Services regarding future testing in a joint environment
- Demonstration of:
 - Multiple joint missions accomplished simultaneously for multiple customers
 - End-to-end evaluation of systems in a joint environment, including contributions of individual systems to joint mission effectiveness
- Leave behind artifacts for future use
 - Joint Operational Context for Test (JOC-T)
 - System Description Document outlining the Logical and Physical designs of the joint mission environment
- Persistent LVC Brigade Combat Team Test Cell integrated into the joint mission environment
- JBD2 JTEM 08 Test Report to capture lessons learned and recommendations



JTEM Products Overview



COI – Community of Interest	CTM – Capability Test Methodology	CTTRA – Common Test & Training Range Architecture
DAU – Defense Acquisition University	JCE – Joint Capabilities Evaluation	JFM – Joint Mission Environment Foundation Model
JME – Joint Mission Environment	JMe – Joint Mission Effectiveness	M&P WG – Methods and Processes Working Group
MSDE – Multi-Service Distributed Event	PID – Program Introduction Document	PM – Program Manager
SDD – System Design Document	SOC – Statement of Capability	



Colonel Eileen Bjorkman
Joint Test Director
757.638.6099

eileen.bjorkman@jte.osd.mil

Mr. Max Lorenzo
Technical Director
757.638.6079

max.lorenzo@jte.osd.mil

Mr. Tim Beach
Chief, Analysis & Methods & Processes Division
757.638.6088

timothy.beach@jte.osd.mil

Email: jtem@jte.osd.mil

Website: <https://www.jte.osd.mil/jtemctm/>

Serving the testing, acquisition, and warfighting communities