

**What's all this
Integrated Test
(oh, *that* IT)
Hubbub?**

Or: Great idea!

**But... how am I supposed to
implement IT?**

Purpose

- Provide integrated developmental/operational (IDT/OT) testing policy history and definitions
- Show how recent integrated testing policy changes have led to a number of implementation challenges
 - Timing/content of test planning documentation
 - Conduct of dedicated operational test (OT)
- Peak under tent at policy implementation guidance

Overview

- Why integrated testing (IT)?
- Integrated testing defined
- Current policy guidance
- Recent changes
- Implementation challenges
 - Timing/Content
 - Test concepts
 - Test plans
 - Conduct
 - Dedicated operational test (OT) duration
 - OT data independence
- Summary

Why Integrated Testing?

- Cost & performance implications of “late” information
 - Bolted-on vs. designed-in
- Operational and testability look at requirements

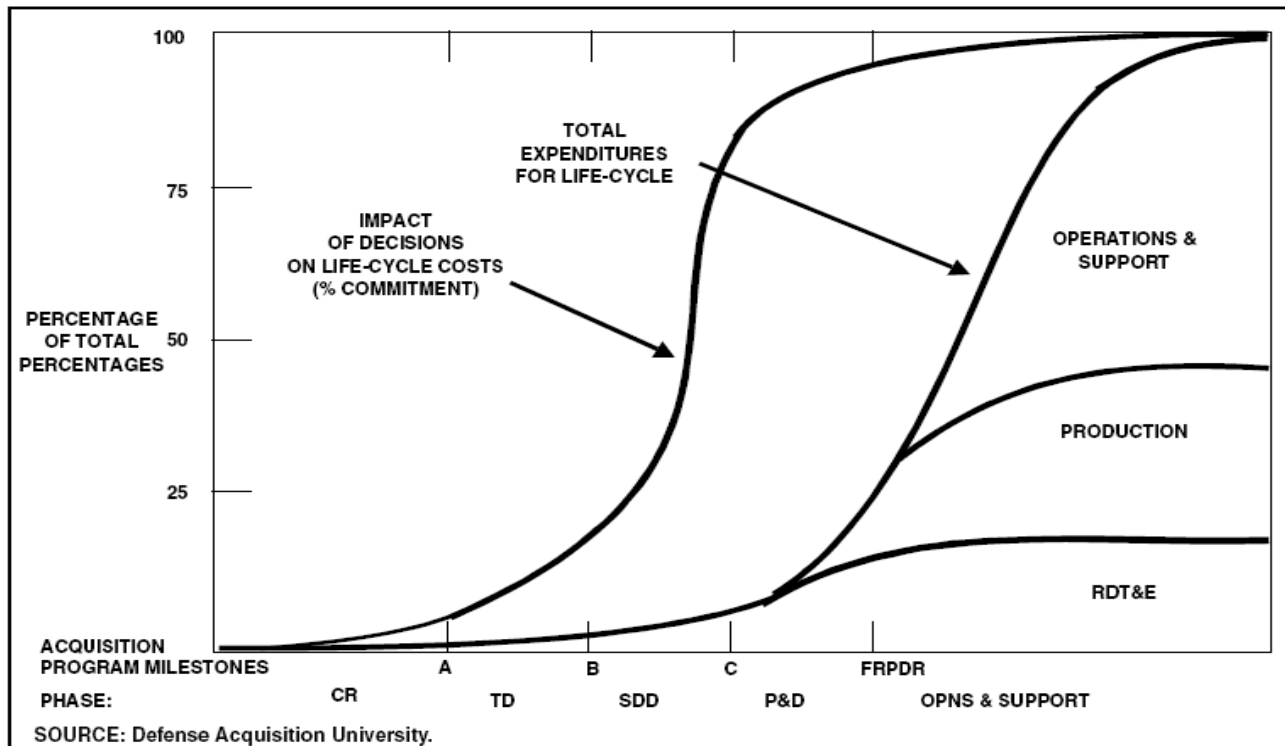
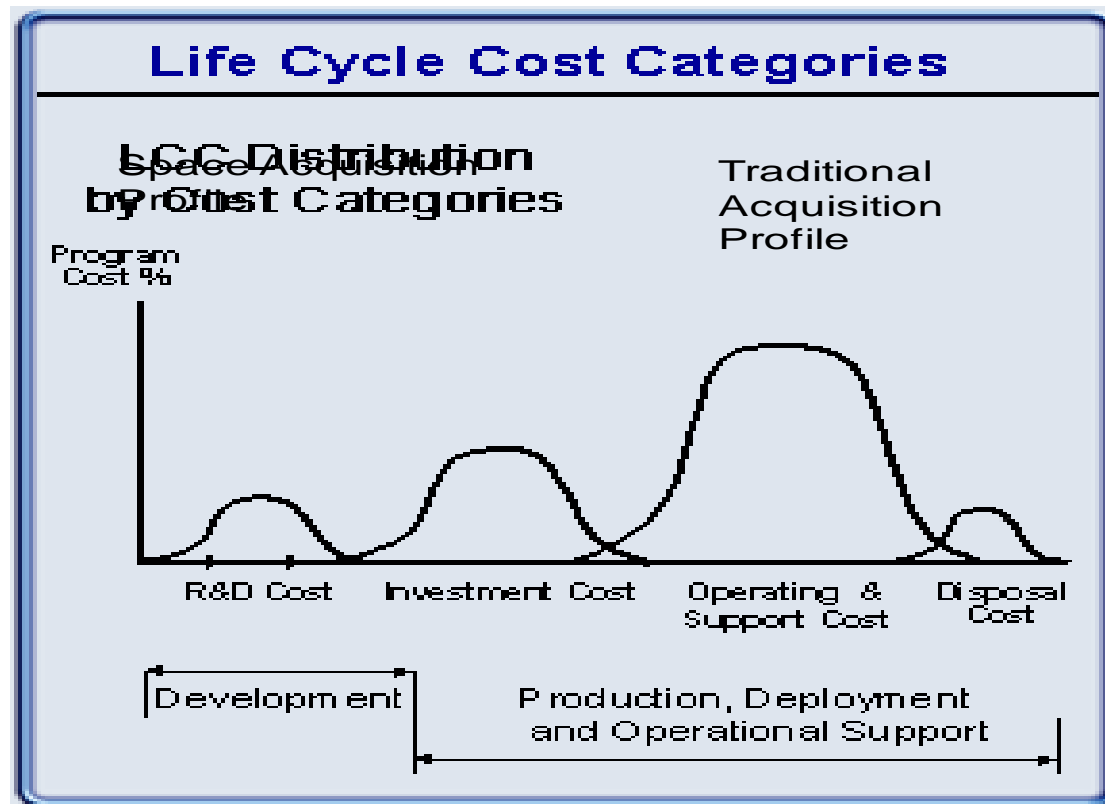


Figure 1-2. Life Cycle Cost Decision Impact and Expenditures

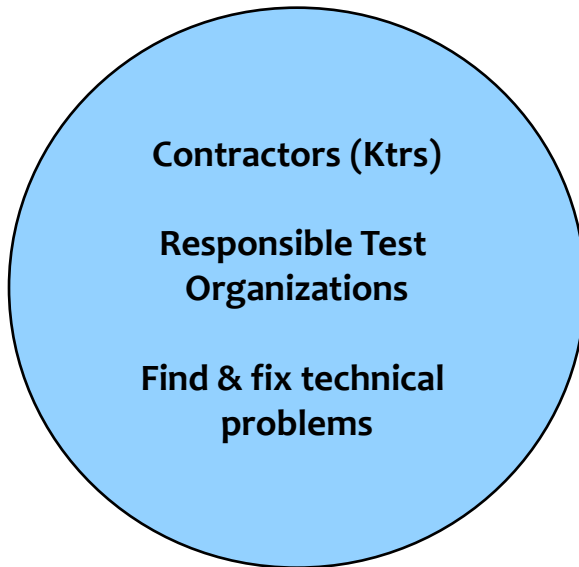
... more critical for space systems

- Traditional OT&E model really falls short for space and other few-of-a-kind (C2) systems
 - OT&E performed with satellite on orbit or C2 system installed

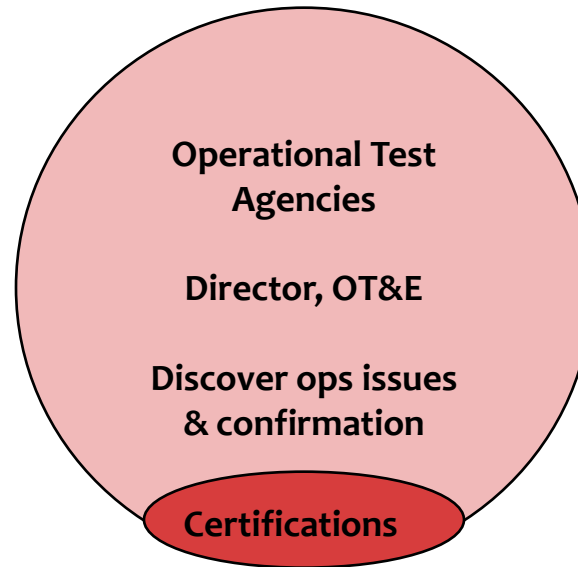


DT/OT to IDT/OT Evolution - Past

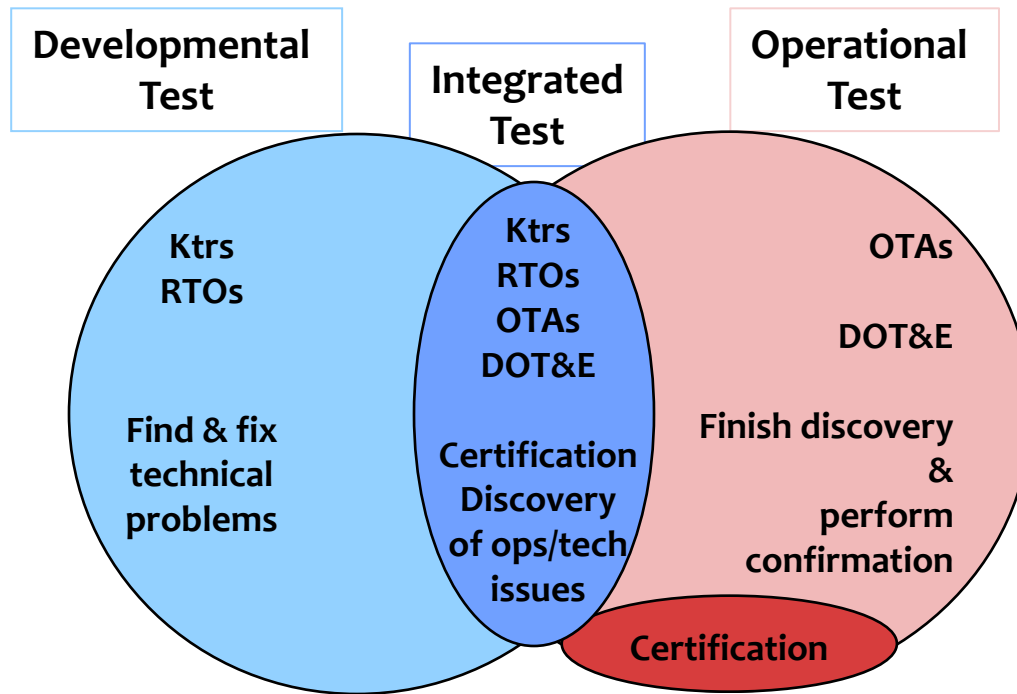
**Developmental
Test**



**Operational
Test**



DT/OT to IDT/OT Evolution - Present



Developmental
Test

Integrated
Test

Operational
Test

Ktrs
RTOs

Find & fix
technical
problems

Ktrs
RTOs
OTAs
DOT&E

Certification
Discovery
of ops/tech
issues

OTAs

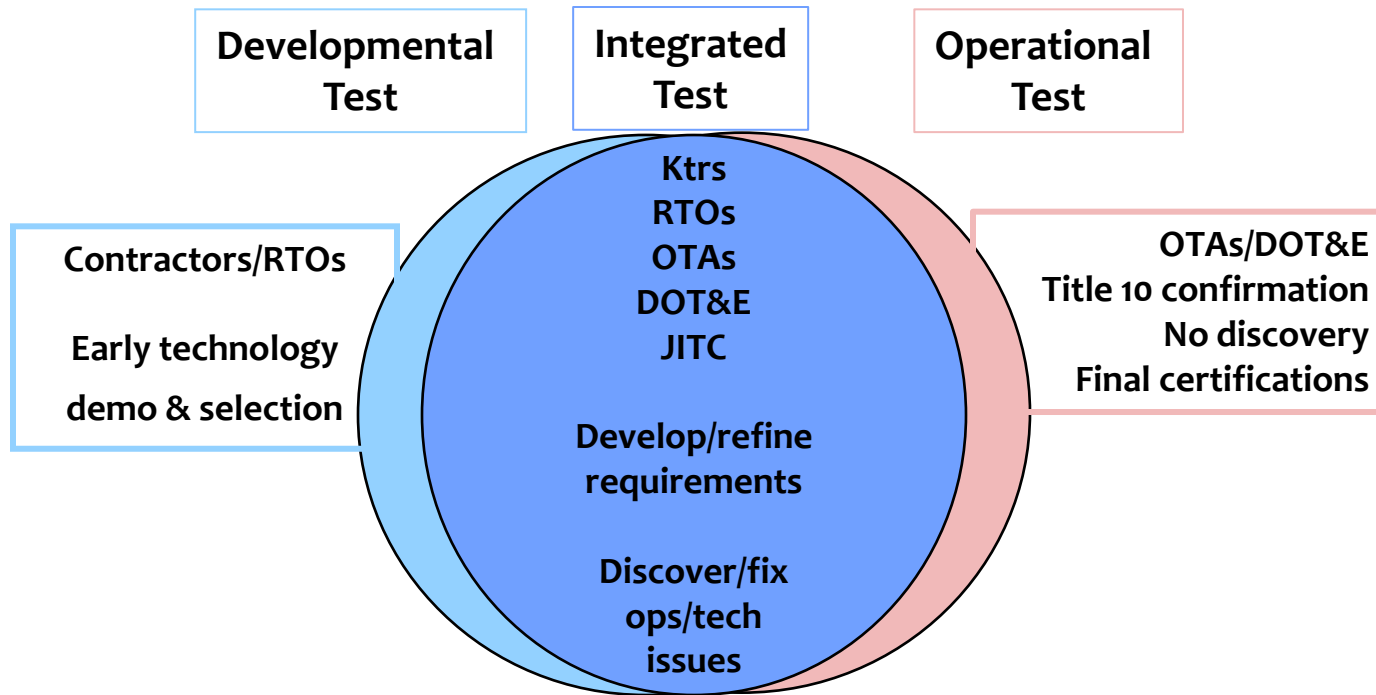
DOT&E

Finish discovery
&
perform
confirmation

Certification

Ktrs	Contractors
RTO	Responsible Test Organization
OTA	Operational Test Agency
DOT&E	Director, Operational Test and Evaluation

DT/OT to IDT/OT Evolution - Future



WIN, WIN:
Meets 2009 Weapon System Reform Act
Capability in warfighters' hands ASAP
Reduces cost, schedule, and risks

Current Policy Guidance

- U.S. Code, Title 10, Section 2399 (MDAP OT&E) & Section 139 (DOT&E)
 - Timing
 - SecDef shall provide that a MDAP may not proceed beyond LRIP until IOT&E is completed
 - Operational testing of a MDAP **may not be conducted until DOT&E approves the adequacy of the plans** (including funding) for OT&E
 - Conduct
 - OT&E defined
 - **Field test, under realistic combat conditions...** determining operational effectiveness and suitability... for use in combat **by typical military users**
 - Development/production contractor involvement
 - Only as planned in operational use
 - Not involved in any way in establishing criteria for **data collection, performance assessment, or evaluation activities**

Current Policy Guidance

■ DoDI 5000.02 (8 Dec 08)

– Timing

- Lead OTA shall brief DOT&E on concepts for an OT&E **120 days prior to start**
- Submit the OT&E plan **60 days prior**, and report major revisions as they occur

– Conduct

- OTA's shall conduct an **independent, dedicated phase of IOT&E** before full-rate production
- OT&E shall be used to determine ops effectiveness & suitability under realistic operational conditions, including joint combat ops
 - **Typical users** shall operate and maintain the system
 - Production or **production-representative articles**
 - H/W and S/W alterations that **materially change system performance**, shall undergo OT&E

2007 Integrated Testing Policy Letters



OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, DC 20301



MEMORANDUM FOR COMPONENT ACQUISITION EXECUTIVES

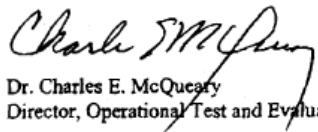
APR 25 2008

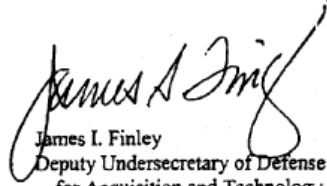
SUBJECT: Definition of Integrated Testing

Rigorous test and evaluation is key to the ability of the Department's acquisition process to provide the Soldiers, Sailors, Airmen, and Marines the systems on which they depend. As we strive to shorten acquisition timelines and meet performance, cost, and schedule thresholds, it is essential to achieve efficiency by integrating all testing (contractor and government).

Integrated testing is the collaborative planning and collaborative execution of test phases and events to provide shared data in support of independent analysis, evaluation and reporting by all stakeholders particularly the development (both contractor and government) and operational test and evaluation communities

The Reliability Improvement Working Group, established by our February 15, 2008 memo, is charged with implementing the mandate to integrate developmental and operational testing and will provide guidance to include this definition in the next update to the Defense Acquisition Guidebook.


Dr. Charles E. McQueary
Director, Operational Test and Evaluation


James I. Finley
Deputy Undersecretary of Defense
for Acquisition and Technology



OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, DC 20301-1000

DEC 22 2007

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Test and Evaluation Policy Revisions

The fundamental purpose of test and evaluation is to provide knowledge to assist in managing the risks involved in developing, producing, operating, and sustaining systems and capabilities.

T&E measures progress in both system and capability development. T&E provides knowledge of system capabilities and limitations to the acquisition community

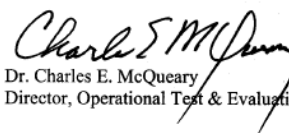
T&E expertise must be brought to bear at the beginning of the system life cycle to provide earlier learning about the strengths and weaknesses of the system under development

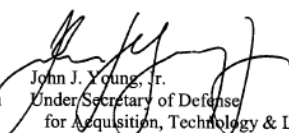
- Developmental and operational test activities shall be integrated and seamless throughout the system life cycle. As technology, software, and threats change, T&E shall be used to assess current mission performance and inform the development of new capability requirements.

Comparison with current mission capabilities using T&E results to determine if any measurable improvements can be determined. If such evaluation indicates that improvements are needed, the Service Component shall propose an alternative.

Requirements to mission capability and operational support based on T&E results shall be reported in terms of operational significance to the user. T&E shall be conducted in the mission context expected at time of reporting and shall be included in the user's capability document, and consider any new validated threat environments that will alter operational effectiveness.

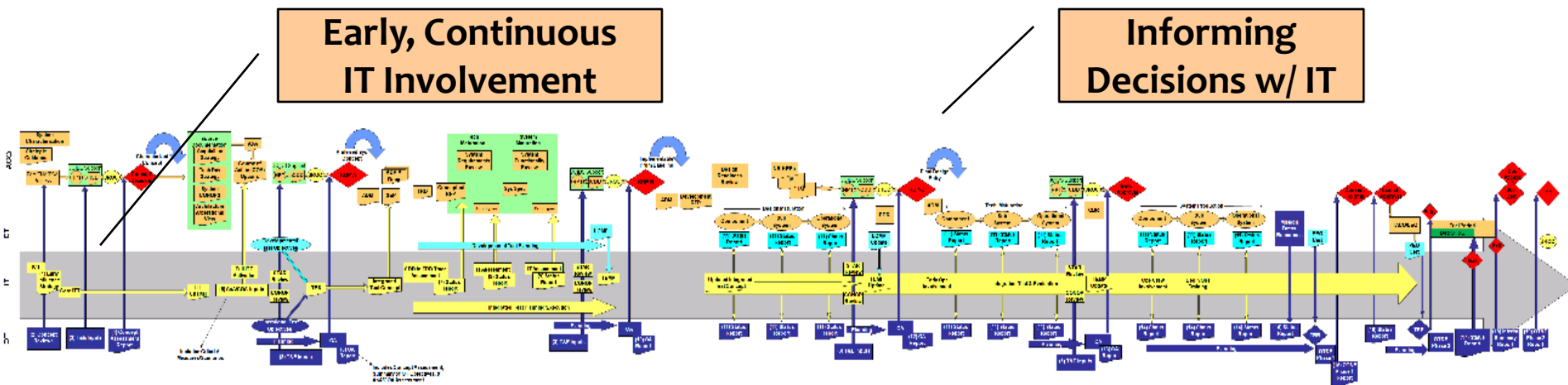
- To maximize the efficiency of the T&E process and more effectively integrate developmental and operational T&E, evaluations shall take into account all available and relevant data and information from contractor and government sources.


Dr. Charles E. McQueary
Director, Operational Test & Evaluation


John J. Young, Jr.
Under Secretary of Defense
for Acquisition, Technology & Logistics

2008 Revised Space Test Anatomy

- AFOTEC's Space Test Initiative became AF's Space OT&E Model (SOT&EM) in AFI 99-103, Chap 8
 - Maximize early influence opportunities; real integrated testing
 - Agile analysis and reporting
 - System-of-system evaluation



Air Force's instantiation of integrated testing

2009 Weapon Systems Acq Reform Act

- Establishes Director, Developmental T&E
- S.454, Section 102 Duties
 - Policy and guidance in coord with DOT&E, integration of DT/OT
 - Review and approve DT&E plan within TEMP
 - Monitor and review MDAP DT&E activities
 - Identify improvements to DT&E organizations and capabilities
 - Develop Joint Annual Report on DT&E/SE objectives fulfillment
 - Issue Joint Guidance on performance measurement

Mirroring DOT&E responsibilities for DT&E

So how to implement IT timing policy...

- U.S. Code, Title 10, Section 2399 (MDAP OT&E) & Section 139 (DOT&E)
 - SecDef shall provide that a MDAP may not proceed beyond LRIP until IOT&E is completed
 - Operational testing of a MDAP **may not be conducted until DOT&E approves the adequacy of the plans** (including funding) for OT&E
- DoDI 5000.02 (8 Dec 08)
 - Lead OTA shall brief DOT&E on concepts for an OT&E **120 days prior to start**
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Where's the starting line?

- Test concept brief and test plan delivery for adequacy approval *prior to dedicated OT... where's the starting line?*
- Proposed guidance
 - Present test concept/draft plan to DOT&E early-on (pre MS-B)
 - Provide integrated test strategy
 - Early plan, but rigorous enough to include:
 - Who will do what (DT, IT, OT events)?
 - What/when information is needed to inform critical decisions?
 - Where/how evaluated (unique test resources, experimental design)?
 - Delivered w/ sufficient time to assess adequacy before execution
 - Test plan(s) delivered prior to majority of IT data collect
 - Plans/versions as knowledge is gained on acquisition/test strategies,
 - In time to execute T&E to inform critical decisions (MS-C, LRIP, IOC, etc.)

... and OT&E duration policy

- U.S. Code, Title 10, Section 2399 (MDAP OT&E) & Section 139 (DOT&E)
 - OT&E defined
 - **Field test, under realistic combat conditions...** determining operational effectiveness and suitability... for use in combat **by typical military users**
- DoDI 5000.02 (8 Dec 08)
 - OTA's shall conduct an **independent, dedicated phase of IOT&E** before full-rate production

How much OT is enough?

- **How much dedicated OT time is required?**
- **Proposed guidance**
 - No pre-defined dedicated OT duration requirement
 - During test strategy development, determine OT objectives satisfied with IDT/OT events' data
 - Plan dedicated OT events to fill data/knowledge gaps
 - Plan a “confirmatory event”
 - Short, operational, independent event
 - Confirms knowledge gained through IDT/OT evaluations

...and valid OT&E data policy

- U.S. Code, Title 10, Section 2399 (MDAP OT&E) & Section 139 (DOT&E)
 - Development/production contractor involvement
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Do these data count?

- Does data collected during IT periods count for dedicated OT evaluations?
- Proposed guidance
 - OTA establish a procedure for evaluating data pedigree
 - System H/W and S/W configuration changes
 - Operational and operator artificialities (i.e., contractor involvement)
 - Data evaluation criteria tools and techniques needed
 - Criteria/evaluation methods for separating data into
 - Valuable for insight
 - Usable for effectiveness and suitability evaluation
 - Data warehouses to capture relevant data pedigree information
 - Objective configuration change assessment methodology
 - Did the change really affect the performance data I've already collected?

Summary

- **Test community moving toward integrated testing**
 - Early information to maximize system performance and minimize costs
- **Where rubber meets the road, implementation challenges**
 - Test concept briefs/early test plans required with sufficient information to understand who, what, where, when, how
 - Test plan(s) submitted prior to majority of data collection
 - Dedicated OT&E duration required to meet objectives
 - OT&E data free of real/perceived developer influence, then independently evaluated

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