

One PM's "Enlightenment" regarding T&E

**ITEA Symposium 2011
Panel on Program Office Perspective**

Scott Anderson

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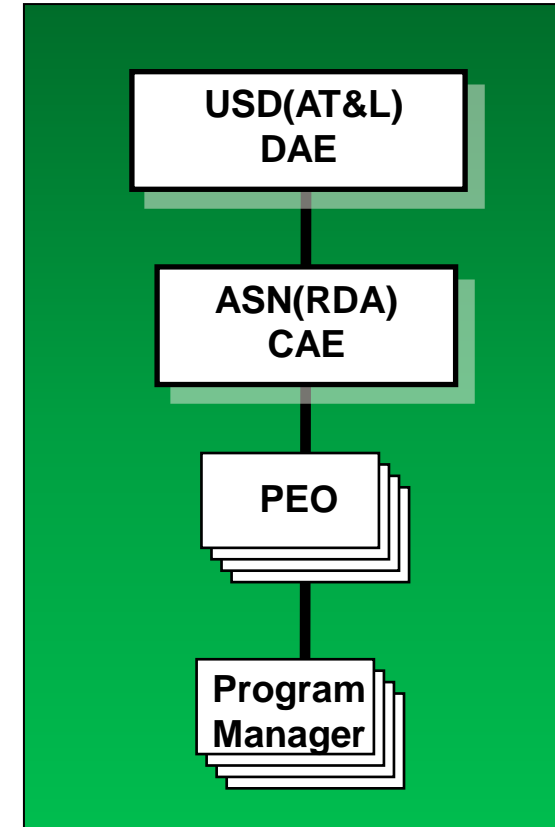
Stage Setting

- **My background:**
 - 20 years of DoD Military Acquisition experience
 - 8 years Testing Experience
 - 7 years PM Experience
- **ACAT 1 Program to develop an advanced ISR sensor for the U.S. Navy**
 - First assigned to stand up an integrated test organization
 - Contractor I&T, Government DT, Government OT
 - Later assigned as the PM of same Program



PM Role – Defined in Statute and Policy

- **The PM has Program Lifecycle Responsibility**
 - All aspects, “cradle to grave”
 - Responsibility, Authority, Accountability (RAA)
- **The PM is the face of the Program**
 - The briefer, the SME, the credibility
 - Actively manage stakeholder perception of the Program
 - Manage risks: cost, schedule, technical, political
 - Deliver a consistent and logical message



“This is the chain of Program accountability, the rest of the folks are there to help” – Dr. Delores Etter (ASN(RDA))

PM Credibility translates to Program Credibility

Where does Testing fit into this Picture?

- **The Problem: Common PM view ... it doesn't!**
 - Testers are “independent” – not part of the “team”
 - Separate reporting authorities
 - Traditionally not limited by programmatic constraints
 - Testers message can put PM Credibility at risk
- **The Solution: Embrace the Test Community as a partner**
 - Objective source of information
 - Use “assessments” (e.g., OAs) to shape program
 - Testers independence can be used to strengthen PM credibility
 - Test to solidify stakeholder support

How can the PM harness the Test Community credibility?

Institutionalize T&E into Program Activities

- **Assign a Govt “test manager” with broad experience**
- **Assign T&E member to IPTs from the start**
 - Negotiate early with the Test Agencies for dedicated personnel
 - Establish a T&E WIPT
 - Specify testable performance requirements
 - Participate in source selection
- **Visit the Govt Test Agencies (DT and OT) regularly**
 - Discuss and align interests, concerns – “war-fighter delivery”
 - Establish meeting rhythm
- **Treat the Testers as “insiders”**
 - Invite the testers to every possible meeting and have them brief
 - Establish and keep direct communication lines open
- **Legitimize the tester’s role throughout the lifecycle**
 - Integrate Testing with Systems Engineering at each level

Establish a “healthy” Relationship with the Test Community

Emphasize Testing with the Contractor

- **Overcome the phrase...**
 - ***“A \$ spent on testing is a \$ spent on bad news.”***
- **Know the contractor test director and reporting structure**
 - Direct to PM? Independent?
- **Thoroughly cover Test Requirements in contract**
 - Specify testing methods (e.g., analysis, demonstration, flight test)
 - Write and test “end to end” mission performance requirements
 - Specify an Integrated Test Team Construct
 - Invoke Govt DT/OT process documentation as required
- **Emphasize Test in the Contract Award Fee (AF) Plan**
 - Give the Govt ITT lead contractual authority - COTR
 - Have the Govt ITT Lead sit on the Award Fee (AF) Board
 - Include Test Program Management as AF criteria
 - Tie fee to “operational” (end-to-end mission) test results
- **Bottom line: War-fighter satisfaction = Program success**

Understand that Testing may be Contentious

Plan for Imperfect Results

- **Insist on Test results as criteria for every major internal program decision**
- **Execute Test Program in an integrated fashion**
 - Form the Integrated (combined contractor and government) Test Team Organization
 - Develop Integrated Processes for: Planning, Resource Management and Execution
 - Set up the Integrated Data Environment
 - Include end to end operational missions and operational assessments prior to any planned independent OT
- **Anticipate discovery in System Level Test**
 - Schedule System Level Testing conservatively
 - Budget for fixes

Hope for the best, but plan otherwise!

LSRS Results



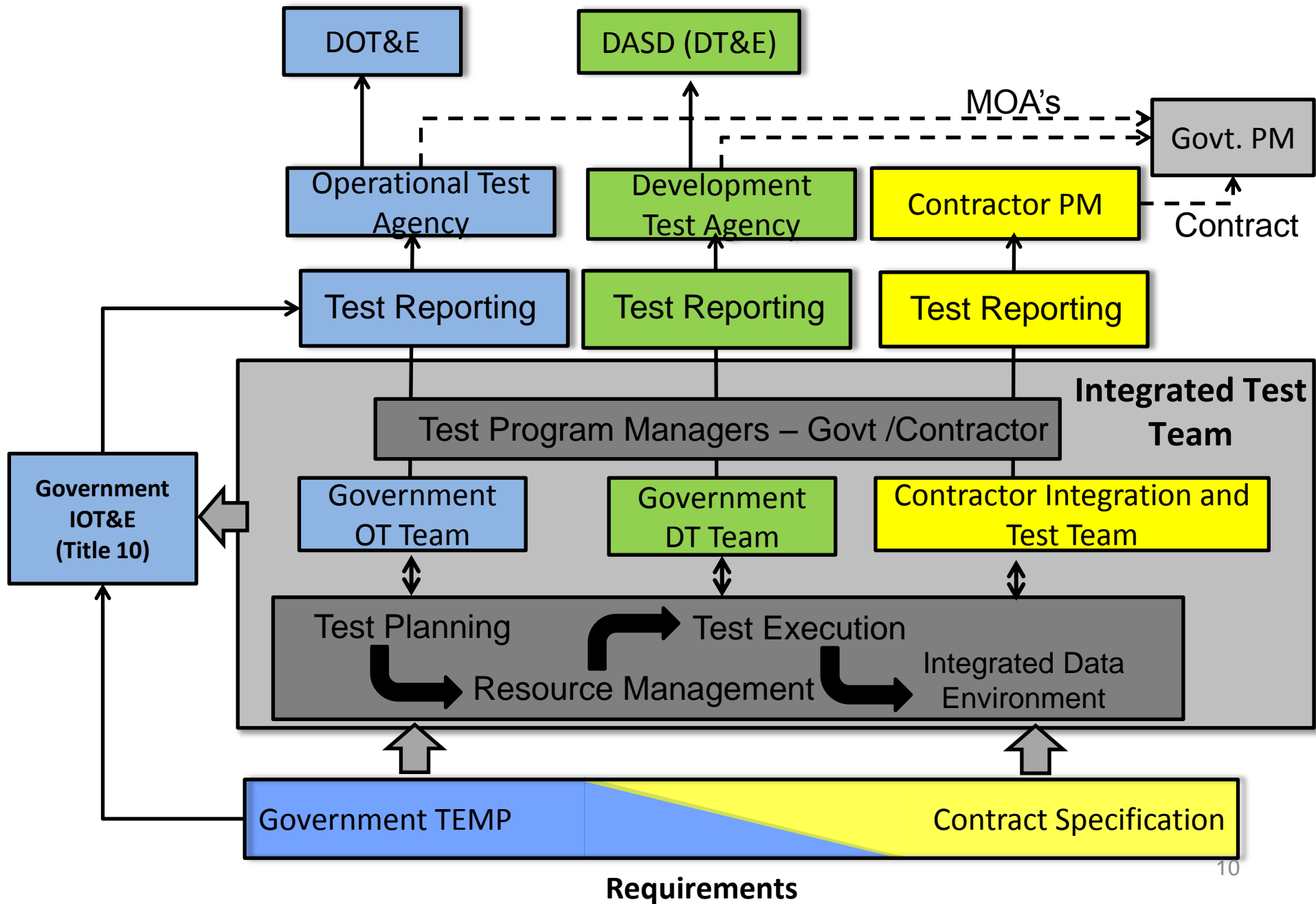
SLAM-ER DT with LSRS Targeting

Questions?

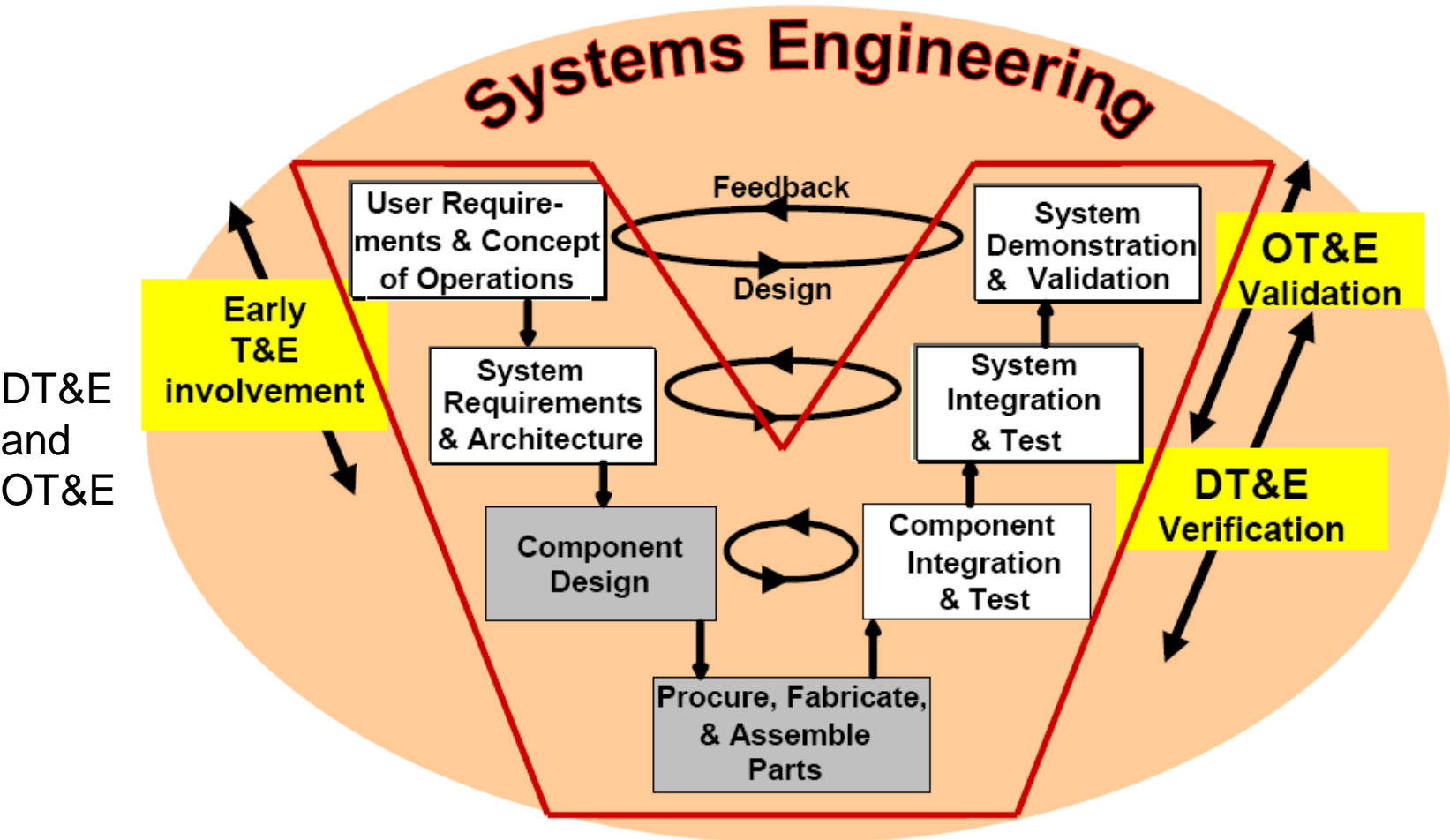
- **Multiple Successful OTs**
 - **OAs identified major issues**
- **Significant schedule and cost “savings”**
- **Responsive to “Fleet” operational issues**
- **Track record of success established Program Credibility**
- **Most important: more effective capability delivered to the Fleet**

Backups

Integrated Test Team Construct



Systems Engineering “V” and T&E



Integrate Testing with Engineering ...

Design Validation throughout Development Cycle

Phase Step	Needs Analysis	Concept Exploration	Concept Definition	Technology Validation	Engineering Design	Integration & Evaluation
Requirements Analysis	Analyze needs	Analyze operational reqmts	Analyze performance reqmts	Analyze functional reqmts	Analyze design reqmts	Analyze reqmts
Functional Definition	Define system functions	Define subsystem functions	Define component functions & interactions	Define subcomponent functions	Define part functions	Define functional tests
Physical Definition	Visualize subsystems, technology	Visualize components, architectures	Select components, architectures	Specify component construction	Specify subcomponent construction	Specify test equipment
Design Validation	Validate needs, feasibility	Simulate, validate performance reqmts	Simulate, validate system effectiveness	Test critical subsystems	Validate component design & construction	Test & evaluate production system

T&E is a key part of every phase

- Include Integration Team as part of Test Team... Integration and Test (I&T)
- Have Test Team “run” the System Integration Lab (SIL)
- Transfer resources (incl. design engineers) to Test Team when System Integration begins

Credit to Dr. Dave Bell

- Tighten the relationship between Design Engineers and the Test Team
- Eliminate traditional “toss it over the fence” approach

Use Testing as a design Risk Mitigation Tool