

NDIA Joint DoD-Industry Life Cycle Cost/Total Ownership Cost Workshop

27 April 2010

Sponsored by:

NDIA Systems Engineering &
Logistics Divisions

Workshop Objective

Convene senior SMEs from OSD, Services and Industry to address major issues related to assessing and optimizing LCC and affordability for both new and existing weapons systems in order to deliver value to the warfighter. The group will identify and prioritize issues and accomplish a first level assessment of root causes of each issue.

Agenda

- 0730 Continental Breakfast
- 0800 Welcome: Bruce Pieper, NDIA Logistics Division, Chair, LCC Committee
- 0810 Opening Remarks: Mr. Randy Fowler (Assistant Deputy Under Secretary of Defense, Materiel Readiness), Mr. Nic Torelli (Director, Mission Assurance Systems Engineering, DDR&E)
- 0845 Agenda Review, Administrative Information, Introductions: Jerry Cothran, NDIA System Engineering Division, Co-Chair, LCS Committee
- 0945 Break
 - Team Composition: 4 teams
 1. Pre-Milestone B (Material Solution Analysis, Technology Development, Analysis of Alternatives)
 2. System Acquisition (EMD: Requirements, Design and Development, T&E)
 3. Production and Deployment (Initial fielding through FOC and standup of Organic Depot capability)
 4. Operations and Support: phase out of production; operational use (FOC through disposal)
- 1000 Walt Cooper (CAPE) Updates on Major Operating and Support (O&S) Cost Projects
- 1030 Team Group Activity 1: Identify and Prioritize the Issues
 - Product: Consensus list of issues prioritized by Life Cycle Phase categories
- 1200 Lunch: Provided
- 1300 Team Group Activity 2: Recommended Actions
 - Product: List of recommended actions to address issues
- 1530 Break
- 1545 Summary/Closing Joel Moorvitch, NDIA System Engineering Division, Co-Chair, LCS Committee
- 1630 Adjourn

Administration

- Team Composition
- Handouts
- Restrooms
- Breaks
- Lunch
- Blackberrys, Cell Phones



During Breaks and Lunch!

Problem Statement

Lack of a well-defined and institutionalized methodology for assessing the life cycle cost and affordability of DoD weapon systems across the defense system life from Material Solution Analysis through Technology Development, EMD, Production and Deployment, Operations and Support, and Disposal activities for new and legacy systems.

There is an urgent need to:

- Conduct early (pre-Milestone B) LCC-Affordability CAIV trades to enable “design for support” of system configurations that will meet warfighter mission capabilities while optimizing life cycle cost and enabling affordable sustainment strategies.
- Emphasize and enable post Milestone B Design and Development tools, guidance, and methodologies that facilitate producing systems that optimize supportability in both the primary system and the enabling support infrastructure.
- Identify and enable methodologies and analytic tools necessary to optimize modifications and upgrades to operationally deployed systems that emphasize and optimize LCC, obsolescence mitigation, and affordable sustainment.

Potential additional discussion areas:

- Also consider upgrades to already deployed systems.
- Also include consideration for incremental capabilities to users
- DoD initiatives for robust, adaptable and supportable systems not currently using Life Cycle affordability.
- Current DoD affordability metrics focused on initial acquisition costs only

Affordability Project Scope

- Identify and characterize LCC-Affordability issues across the DoD life cycle framework
- Address both new development programs and legacy deployed operational systems
- Address Systems Engineering and Logistics Engineering functions and methodologies including Analysis of Alternatives, System Architecting, “Design for Support”, CAIV trades, optimizing the Primary system and the Enabling product support infrastructure, and assessing and optimizing modifications, upgrades, and service life extension programs for affordable sustainment and minimized life cycle cost

Affordability Project Tasks

- Conduct DoD and Industry workshop
 - April 27, 2010
- ID and prioritize LCC-Affordability issues
- Determine root cause and relationship of these issues to the system life cycle.
- Prepare recommendations and appropriate guidance

Affordability Project Deliverables

- A gap analysis identifying prioritized LCC-Affordability issues mapped to the DoD life cycle framework
- A top-level root cause analysis for the identified issues
- Initial list of required solution sets for LCC-Affordability issues
- Initial list of appropriate supporting/enabling metrics pertinent to identified issues and solution sets
 - Action/path forward recommendations report that can provide the foundation for: A more detailed action plan
 - Subsequent DoD/OSD policy and guidance on LCC-Affordability

Affordability Project Schedule

- Workshop April 2010
- Prioritized Issues List May 2010
- Results of root cause analysis September 2010
- List of appropriate metrics December 2010
- Recommendations March 2011

LCC/TOC Challenges

Policy & Guidance

- Policy and Guidance
- Where are LCC/TOC opportunities?
- Focus by Life Cycle Phases
- Affordability Touch Points

Policy & Guidance

- Weapon Systems Acquisition Reform Act (WSARA) 2009
 - Established the new Cost Assessment and Program Evaluation Office
 - **Stronger emphasis on cost** and accurate cost estimates
- Section 805 2010 NDAA
 - “Maximize value to the Department of Defense by providing the best possible product support outcomes **at the lowest operations and support cost**”

Policy & Guidance

- 2010 Sustainment Governance
 - “Increasing visibility of sustainment factors is vital to ensuring we deliver a program that meets Warfighter materiel readiness objectives with long-term **affordability** consideration”

SAMPLE PROGRAM: "ABC" Date:

Product Support Strategy

Sustainment Approach

- Current (initial CLS covering total system)
- Future (sub-system based PBL contracts)

Issues

- Shortfall in O&M funding in FYDP
- Reliability and availability estimates are below goals
- LCSP requires update before DAB

Resolution

- POM request for O&M restoration submitted
- Reliability improvement plan with clear RAM goals up for final signature
- LCSP in draft

Metrics Data

Metric	Antecedent Actual	Original Goal	Current Goal	Current Estimate/Actual
Materiel Availability	76%	80%	77%	71%
Materiel Reliability	37 hrs	50 hrs	50.5 hrs	48 hrs
Ownership Cost	245.6B	385.5B	395.1B	395.1B
Mean Down Time	12 hrs	20 hrs	18 hrs	18 hrs

* Test or fielding event data derived from _____
Notes:

O&S Data

Cost Element	Antecedent Cost	ABC Original Baseline	ABC Current Cost
1.0 Unit Level Manpower	3,952	5,144	5,750
2.0 Unit Operations	6,052	6,851	6,852
3.0 Maintenance	0,739	0,605	0,589
4.0 Sustaining Support	2,296	2,401	2,401
5.0 Continuing System Improvements	0,129	0,025	0,035
6.0 Indirect Support	1,846	1,925	1,960
Total	15,046	16,951	17,687

Cost based on average annual cost per squadron

Total O&S Costs	Antecedent	ABC
Base Year \$M	102,965.2	184,011.9
Then Year \$M	245,665.3	395,147.2

Sustainment Schedule

Today

MS B | MS C | IOC FRP | FOC | Sustainment

Timeline events: BCA, LCSP, LRIP Contract Award, CLS Start, Depot Standup, Blended Partnership Startup, PBL Recompete, Avionics PBL, PBL Recompete

ATTACHMENT

Policy & Guidance

- PSAT Report
 - “The **lack of an affordability requirement and adequate visibility of operating and support costs** has been a long-standing barrier to effectively assessing, managing, and validating the benefits or shortcomings of product support strategies”
 - “Recommendation: **Make life cycle affordability a core business process** for all communities and stakeholders involved in system acquisition and sustainment”

Policy & Guidance

- USD/ATL Reliability, Availability, and Maintainability Policy memo 2008
 - “Establishing reliability improvement policy, with appropriate oversight, will support effective implementation of the mandatory Materiel Availability Key Performance Parameter, and Material Reliability and **Ownership Cost** Key System Attributes”

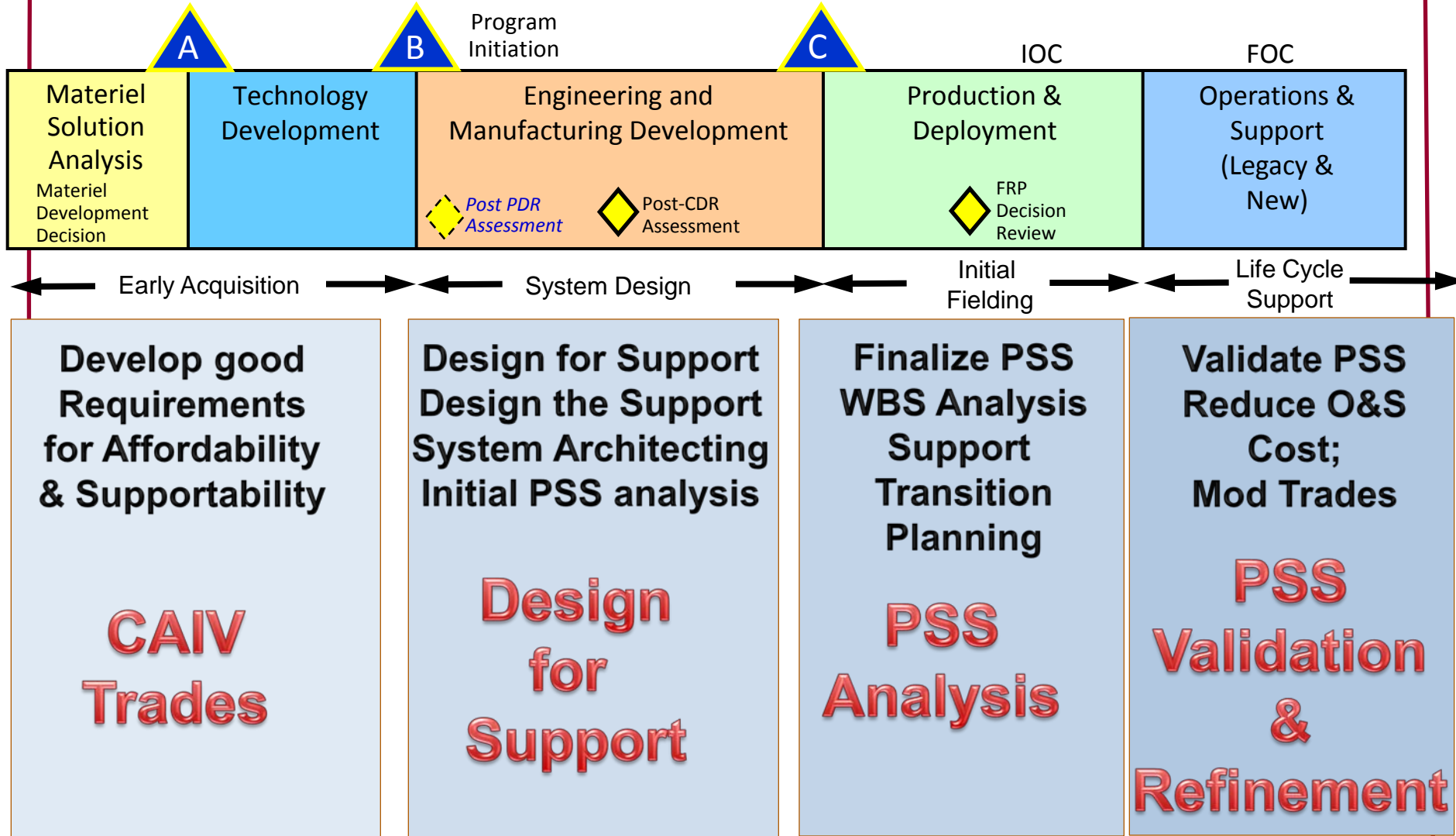
Policy & Guidance

- USD/ATL Next Steps to Improve System Reliability memo, March 2010
- “My Director, Systems Engineering, will chair a working group with executive membership representing the Director, Defense Procurement and Acquisition Policy; the Director, Developmental Test and Evaluation; the Assistant Deputy Under Secretary of Defense for Materiel Readiness; and the President, Defense Acquisition University. **The Director will assess existing reliability policy and, within 90 days, propose actions for my approval that will improve effectiveness.**”

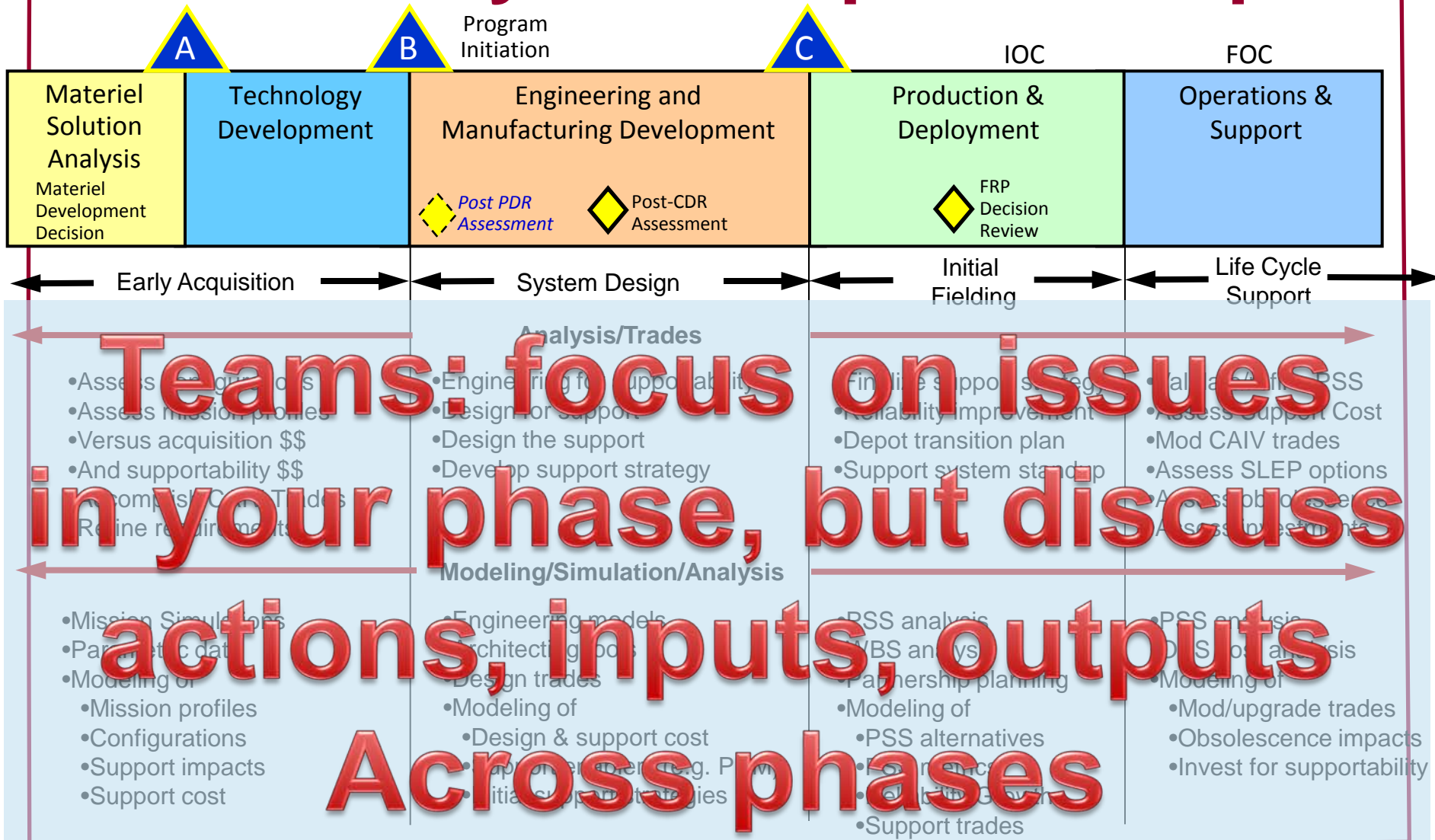
Where are LCC/TOC Opportunities?

- Life Cycle Phase
 1. **Pre-Milestone B** (Material Solution Analysis, Technology Development, Analysis of Alternatives)
 2. **System Acquisition** (EMD: Requirements, Design and Development, T&E)
 3. **Production and Deployment** (Initial fielding through FOC and standup of Organic Depot capability)
 4. **Operations and Support**: phase out of production; operational use (FOC through disposal)

Across the Life Cycle



Analyses Scope and Depth



Teams: focus on issues in your phase, but discuss actions, inputs, outputs Across phases



Updates on Major Operating and Support (O&S) Cost Projects

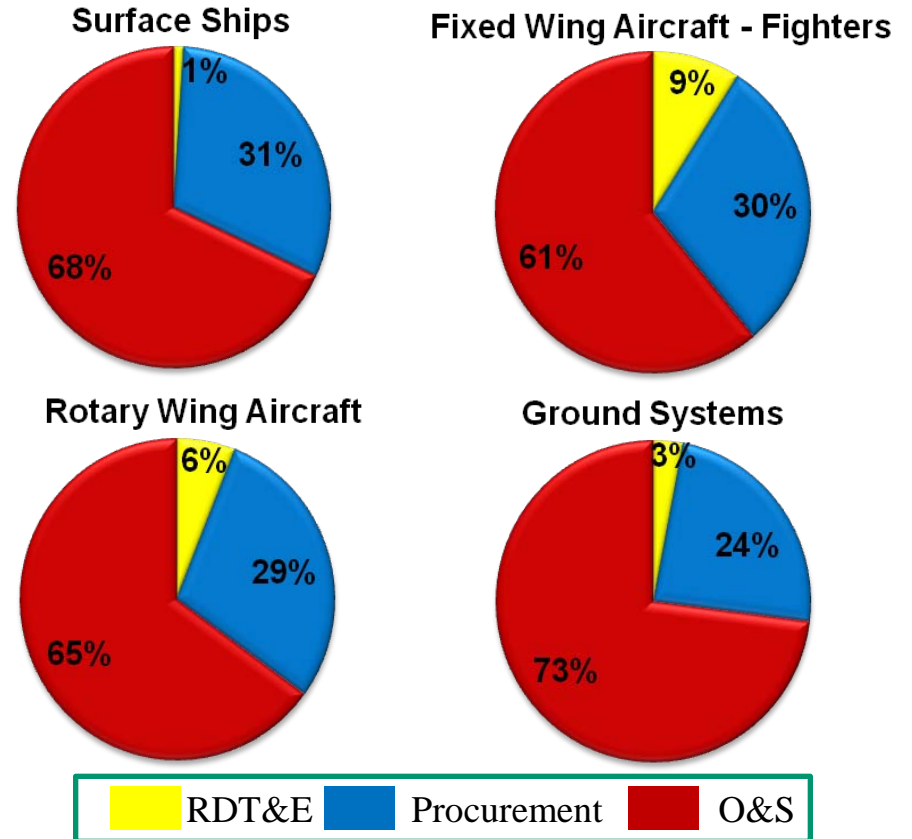
NDIA/DoD Life Cycle Cost/Affordability Workshop

Walt Cooper
CAPE
April 27, 2010



About O&S Costs

- Long track record of real annual growth
- O&S costs tend to increase with greater weapon system complexity





CAPE Responsibilities in O&S Costing

- Lead or assist DoD efforts related to O&S costing
 - Collection of contractor costs
 - Work with L&MR on Life Cycle Management Initiatives
 - Use of T&E data in cost analysis
 - Linking reliability with O&S costs
 - Costs of depot operations
- Prepare independent estimates of O&S costs
- Provide oversight of cost collection programs: Visibility and Management of Operating and Support Costs (VAMOSOC)
 - Establish policy
 - Promote use of actuals to predict future costs
 - Conduct annual review, required by regulation



WSARA-Directed Review of O&S Costs for Major Defense Acquisition Programs

- Two tasks
 - Review existing systems and methods for tracking and assessing O&S costs for MDAPs. Include findings and recommendations.
 - Assess feasibility and advisability of establishing baselines for O&S costs
- Report to be provided to the Secretary by May 22, 2010 and oversight committees within 30 days thereafter

Statute does not identify issues, but we know we have a problem with cost growth.



About the Departments' Systems and Methods

- More than 60 systems used across the military departments and OSD – all geared to support decision-making and analysis
- No major issues with the systems and methods themselves
- Instead, we need to:
 - Improve the quality and timeliness of the information
 - Strengthen estimating methods by providing more recent results from testing
 - Examine our human capital -- size and skills of O&S cost analysis workforce – and supporting information systems



Establishing O&S Cost Baselines

- Department has been moving in this direction since 2004 Defense Science Board review
 - Ownership Cost Key System Attribute
 - Resources-to-Readiness pilot program (PB-60)
 - Sustainment Quad Chart
- Challenges
 - Accountability
 - Validation
 - Promoting good decision-making



Areas of Likely Recommendations

- Management oversight
- Quality and timeliness of O&S cost information
- Visibility into investments in reliability and maintainability
- O&S cost baselines



Sustainment Contractor Cost Reporting

- Reliance on industry for sustainment has increased in recent years
- Notable examples
 - Stryker in OIF
 - MRAP vehicles in OEF and OIF
 - F/A-18 E/F
 - F-22A
 - T-45 Navy jet trainer
 - C-17A
 - Joint Surveillance Target Attack Radar System (Joint STARS)
 - UAVs
- The issue: Limited visibility into contractor costs seriously degrades cost analysis in support of life cycle cost estimates, business case analyses



Current State of Reporting

Numerous programs have submitted sustainment cost-reporting plans

- Military departments and CAPE working these on a case-by-case basis
- Non-standard reporting structures BUT structures are “mappable” to standard O&S cost structures

Program	Contractor
F-119 Engine (F-22A)	Pratt & Whitney
F-22A Air Vehicle*	Lockheed Martin
F-414 Engine (F/A-18E/F)	General Electric
Joint Cargo Aircraft	L-3
C-5M RERP	Lockheed Martin
C-17A	Boeing
Stryker	General Dynamics
V-22	Bell-Boeing
Light Utility Helicopter	EADS
F-35 (JSF)	Lockheed
F/A-18E/F FIRST	Boeing



Path Forward

- We have coordinated proposed formats, data item descriptions and reporting requirements with cost centers and industry
 - Industry participation: Northrop Grumman, Boeing, Lockheed Martin, GDLS, Pratt & Whitney, and Raytheon
- Will launch training program for industry this fall
- Mandatory reporting requirements for sustainment will be published later this year



Additional Topics

- Greater rigor needed in Milestone A life cycle costing... PM must notify Milestone Decision Authority if estimate increases by more than 25%
- Addressing energy efficiency in AoAs -- Fully Burdened Cost of Fuel
- Capturing full manpower costs -- Fully Burdened Cost of Manpower

LCC/TOC Issues

NDIA/DoD LCC/TOC Workshop
27 April 2010

LCC/TOC Issues Categories

- 1. Culture/Lack of Understanding/Value**
 - Source Selection Authorities
 - RFP authors
 - DoD reviewers
 - Education
- 2. Lack of Sufficient Requirements Definition**
 - Definition of scope and incremental plan
 - Missing TOC requirements
 - Missing Design for Support Requirements
 - Missing Support of the Design requirements
 - Methodology for improving confidence and completeness of requirements
- 3. Disconnect between Budgeting and LCC Analysis**
 - Inflexibility of Funding Sources
 - Colors of money
 - Annual funding profiles/budgeting cycles

LCC/TOC Issues Categories Cont

4. **Limitations to Contracting**

- Limited multi-year contracts
- Competition for Competition sake
- Policy/Title 10

5. **Lack of Sufficient Evaluation Tools/Methodologies**

- No agreed upon models for LCC trades (cost and performance)
- BCA
- Lack of actuals
- Need to identify cost drivers and questions by program phase
- Evaluating completeness of requirements and KPPs/KSAs

6. **Conflicting Program Management Concerns**

- Keep program sold
- Talk LCC but work in shorter term decisions
- Ensure program executable
- Cost estimating approaches
- Lack of skilled People

7. **Stovepipe Organizations**

- Don't work holistically
- Multiple Teams/Overlapping Charters

One Team per L/C Phase

Teams:

1. Pre-Milestone B (Material Solution Analysis, Technology Development, Analysis of Alternatives)
2. System Acquisition (EMD: Requirements, Design and Development, T&E)
3. Production and Deployment (Initial fielding through FOC and standup of Organic Depot capability)
4. Operations and Support: phase out of production; operational use (FOC through disposal-Includes Legacy Systems)

Discussion Starters

- Pre-Milestone B
 - Need for Modeling & Simulation, Tech demo contracts, better D4S enabling requirements
- System Acquisition
 - Design for Support tools, O&S/supportability ‘forcing functions’
- Production & Deployment
 - Better BCA process; valid cost comparisons; improved Logistics transition to operations
- Operations & Support
 - 70-80% of our O&S cost is on legacy out of production systems, yet all our policy and rhetoric is on new acquisition programs – how do we attack that huge cost issue?

Team Activity 1

- Using provided “Issues Categories” list (and adding /revising as necessary) Document and Prioritize Issues On Templates provided
- Product: Consensus list of issues prioritized within 4 L/C phase categories
- Time: 45 minute discussion, 10 minute per team outbrief (90 minutes)
- Discuss issues within assigned team categories
- Develop specific issues; prioritize
- Outbrief

Teams

Andy Long	1
Dan Proulx	1
Kyle Reybitz, Maj	1
Liz Rodríguez-Johnson	1
Marion Eggenberger	1
Mike Carey	1
Paul Davidson	1
Phil Fahringer	1
Rita Dixon	1
Steve Loftus	1
Tom Billig	1
Sterling Crawford	1
Bill Kobren	2
Charles Borsch	2
Joe Gordon	2
Jon Buresh	2
Pete Eltringham	2
Ricardo Cabrera	2
Rod Buck	2
Bruce Pieper	2
Teresa Marshall	2
Tom Albano	2
Walt Cooper	2

Ashton Bulloch	3
Capt Jerry Reid	3
Chris Price	3
George Prosnik	3
Robert Novak	3
Stuart Booth	3
Jan Edmunds	3
Joe Fengler	3
Joe Spruill	3
John Phillips	3
Larry Hill	3
Tony Stampone	3
Ceasar Sharper	4
Dick Engwall	4
Gloria Edwards	4
Jim Beggs	4
John Duckworth	4
Rose DiGeronimo	4
Sam Brown	4
Sharon Jackson	4
Stephen Henry	4
Tom Burton	4
Tom Herald	4

Ground Rules

- Try to identify Major Issues-Don't Worry about Solutions
- Include issues even if other teams or initiatives underway to address
- Identify hand-offs between L/C phases
- Document any major barriers or constraints.
- Non-Attribution. Comments are kept in the room.
- Think out of the box
- No issue is insignificant

Issues Template

- Life Cycle Phase
- Major LCC Issue Category
- Description of Issue
- Barriers/Constraints
- Key Inputs
- Key Outputs
- Affect on Affordability (H, M, L)
- Priority for Resolution
- POC for follow-up

LUNCH!!



Team Activity 2

- Use issues developed and revised during consensus facilitation
- Product: List of root causes and initial actions to address issues (e.g. policy, guidance, training, tiger team, etc.)
- Time: 1 hour discussion, 15 minute per team outbrief (2 hours)
- Discuss issues, root causes, initial solution actions within assigned team categories
- Outbrief

Root Cause Template

- Life Cycle Phase
- Major LCC Issue Category
- Description of Issue
- Root Causes
- First cut of potential solutions (If time permits)
- POC for follow-up

Summary

- ✓ Issues identified and documented?
- ✓ Consensus on above?
- ✓ Classified within (and across) 4 life cycle phase categories?
- ✓ Root causes and initial solution recommendations for all issues?

Post Workshop Actions

- NDIA LCS sub-committee (members and ‘volunteers’)
- Complete issue descriptions, categorization, root cause analysis, and recommended solution actions
- Objective: prepare LCC-TOC Issues Report for OSD (Randy Fowler, Nic Torrelli)
- Submit to OSD; commit to work jointly on implementation recommendations

THANK YOU!

