Program Support Review Deep Dive

Pete Nolte

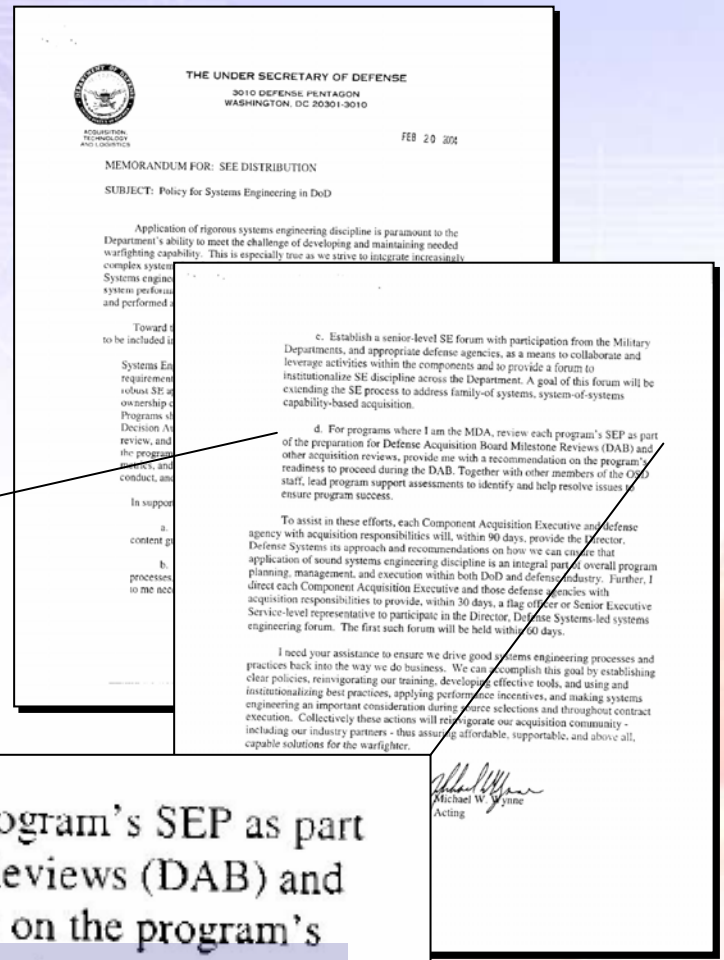
Systems and Software Engineering
Office of the Under Secretary of Defense
for Acquisition and Technology

October 2007

What Are Program Support Reviews?

USD(AT&L) Imperatives:

- "Provide a context within which I can make decisions about individual programs."
- "Achieve credibility and effectiveness in the acquisition and logistics support processes."
- "Help drive good systems engineering practices back into the way we do business."



THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

FEB 20 2004

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Policy for Systems Engineering in DoD

Application of rigorous systems engineering discipline is paramount to the Department's ability to meet the challenge of developing and maintaining needed warfighting capability. This is especially true as we strive to integrate increasingly complex system

c. Establish a senior-level SE forum with participation from the Military Departments, and appropriate defense agencies, as a means to collaborate and leverage activities within the components and to provide a forum to institutionalize SE discipline across the Department. A goal of this forum will be extending the SE process to address family-of systems, system-of-systems capability-based acquisition.

d. For programs where I am the MDA, review each program's SEP as part of the preparation for Defense Acquisition Board Milestone Reviews (DAB) and other acquisition reviews, provide me with a recommendation on the program's readiness to proceed during the DAB. Together with other members of the OSD staff, lead program support assessments to identify and help resolve issues to ensure program success.

To assist in these efforts, each Component Acquisition Executive and defense agency with acquisition responsibilities will, within 90 days, provide the Director, Defense Systems its approach and recommendations on how we can ensure that application of sound systems engineering discipline is an integral part of overall program planning, management, and execution within both DoD and defense industry. Further, I direct each Component Acquisition Executive and those defense agencies with acquisition responsibilities to provide, within 30 days, a flag officer or Senior Executive Service-level representative to participate in the Director, Defense Systems-led systems engineering forum. The first such forum will be held within 60 days.

I need your assistance to ensure we drive good systems engineering processes and practices back into the way we do business. We can accomplish this goal by establishing clear policies, reinvigorating our training, developing effective tools, and using and institutionalizing best practices, applying performance incentives, and making systems engineering an important consideration during source selections and throughout contract execution. Collectively these actions will reinvigorate our acquisition community - including our industry partners - thus assuring affordable, supportable, and above all, capable solutions for the warfighter.

Michael W. Wynne
Acting

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Systems and Software Engineering

Assessments & Support

DEPUTY DIRECTOR, ASSESSMENT & SUPPORT

Mr. David Castellano

Glynn James

Suzette Manduley

Infrastructure Support

Ryan Sinclair
Michelle Grillo
Beth Bernat (P/T)
Laura Dwinnell (P/T)
Sarah Rogers (P/T)

Matrix

Mike Cribbs
Lisa Reuss
Dave Gallagher
Spiros Pallas
Don Gantzer
Rich Taylor
Christine Hines
Peter Tabbagh
Jim Bachand
Mike Zsak
Donna Carey
Tom Parry
Chris Powel l

Land Combat

Pete Nolte

John Mercer
John Quackenbush
Jim Waldeck (P/T)
Steve Cox

Fixed Wing Aircraft

Jim Thompson

Bob Darwin
Scott Menser
Nicole Bratt
Bob MacMullin
Joe D'Ambra

Business

Howard Sterling

Roger Kammerdeiner
Steve Hancock

C2ISR

Ray Shanahan (Acting)

Don Maziarz
Dick Overmyer

Rotary Wing & UAS

Jim Schultz

Dick Scott
Kevin Wilcutt
James Alexander
Gregory Carswell

Communications

Ken Hong Fong

Regi Chikar
Jim Wright
Chuck Johnson
Steve Raphael

Subs & Ships

Darren Piccirillo

Mike Wagner
John Clifford

Missiles

Susan van der Veer

Doc Holiday
Gerry Mello

General Review Areas

ASSESSMENT METHODOLOGY FOR PRE-MILESTONE C

1.0	Mission Capabilities/Requirements Assessment Area	4
	Sub-Area 1.1 – Operational Requirements	4
2.0		
3.0		
4.0		
5.0		
6.0		

ASSESSMENT METHODOLOGY FOR PRE-MILESTONE B

1.0	Mission Capabilities/Requirements Assessment Area	4
	Sub-Area 1.1 – Operational Requirements	4
2.0		
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5.0		
6.0		

ASSESSMENT METHODOLOGY FOR PRE-MILESTONE A

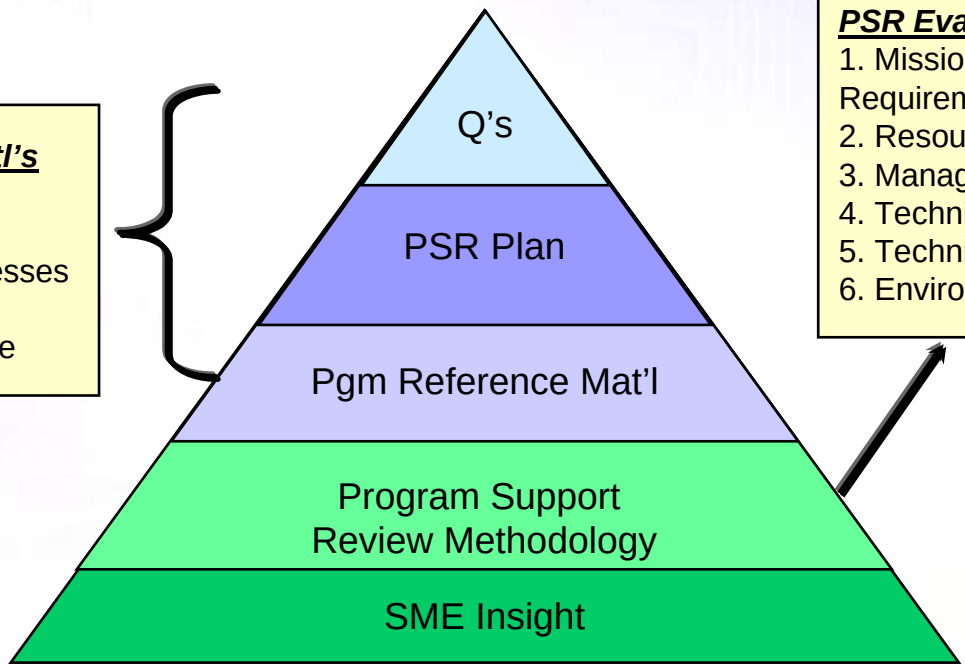
1.0	Mission Capabilities/Requirements Assessment Area	4
	Sub-Area 1.1 – Operational Requirements	4
2.0	Resources Assessment Area	9
3.0	Sub-Area 2.1 – Program Planning and Allocation	9
	Sub-Area 2.2 – Personnel	10
4.0	Sub-Area 2.3 – Facilities	12
	Sub-Area 2.4 – Engineering Tools	13
3.0	Management Assessment Area	16
	Sub-Area 3.1 – Acquisition Strategy/Process	16
	Sub-Area 3.2 – Project Planning	19
4.0	Sub-Area 3.3 – Program and Project Management	21
	Sub-Area 3.4 – Contracting and Subcontracting	26
	Sub-Area 3.5 – Communication	28
4.0	Technical Process Assessment Area	30
	Sub-Area 4.1 – Technology Assessment and Transition	30
	Sub-Area 4.2 – Requirements Development	31
	Sub-Area 4.3 – Functional Analysis & Allocation	32
	Sub-Area 4.4 – Design Synthesis	33
5.0	Sub-Area 4.5 – System Integration, Test and Verification	35
	Sub-Area 4.6 – Transition to Deployment	37
	Sub-Area 4.7 – Process Improvement	38
5.0	Technical Product Assessment Area	38
	Sub-Area 5.1 – System Description	38
6.0	Sub-Area 5.2 – System Performance	42
	Sub-Area 5.3 – System Attributes	43
6.0	Environment Assessment Area	44
	Sub-Area 6.1 – Statutory and Regulatory Environment	45

http://www.acq.osd.mil/sse

Program Support Review (PSR)

- DAPS; a repeatable, tailorable, exportable process
- Trained workforce with understanding of program issues

PSR Reference Matl's
- Templates
- Sample Questions
- Documented Processes
- Training Materials
- Execution Guidance



PSR Evaluation Areas
1. Mission Capabilities/ Requirements
2. Resources
3. Management
4. Technical Process
5. Technical Product
6. Environment

"…PSR team serves as 'disinterested 3rd party' that allows [the PM] to approach leadership armed with powerful program truths, reinforce issues." (PM)

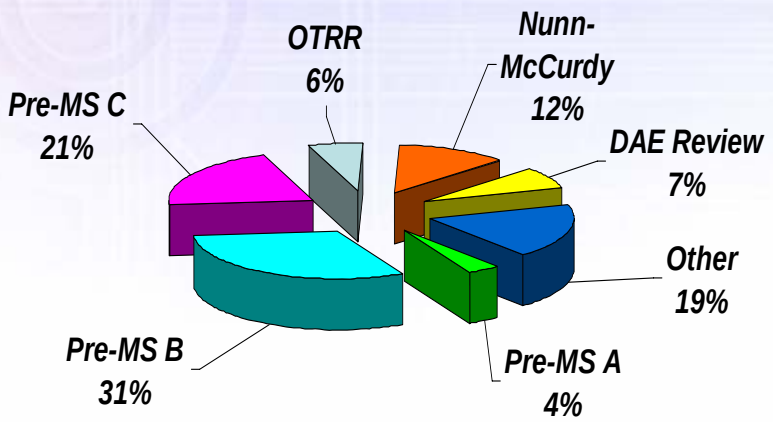
PMs Report Process is Insightful, Valuable, and Results Oriented; better than 95% acceptance of recommendations

Program Support Review Activity

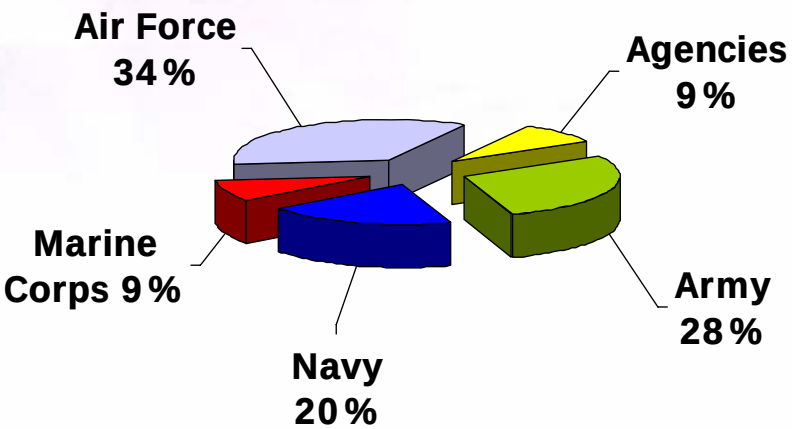
(since March 2004)

- PSRs/NARs completed: 48
- AOTRs completed: 11
- Nunn-McCurdy Certification: 10
- Participation on Service-led IRTs: 2
- Technical Reviews: 10
- Reviews planned for FY07:
  - PSRs/NARs: 8
  - AOTRs: 1

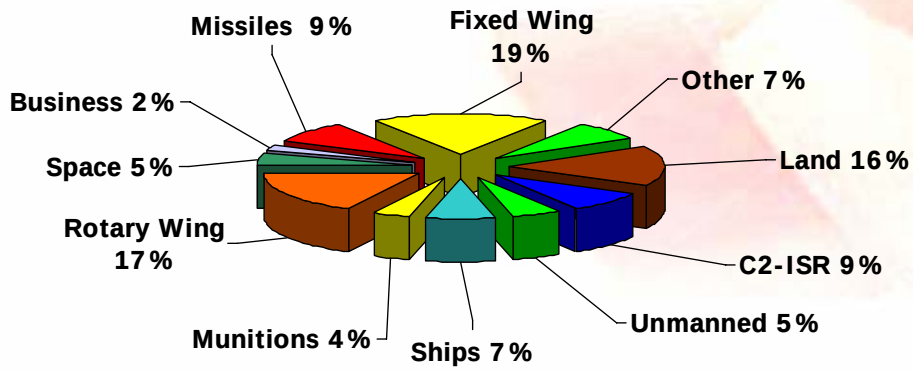
Decision Support Reviews



Service-Managed Acquisitions

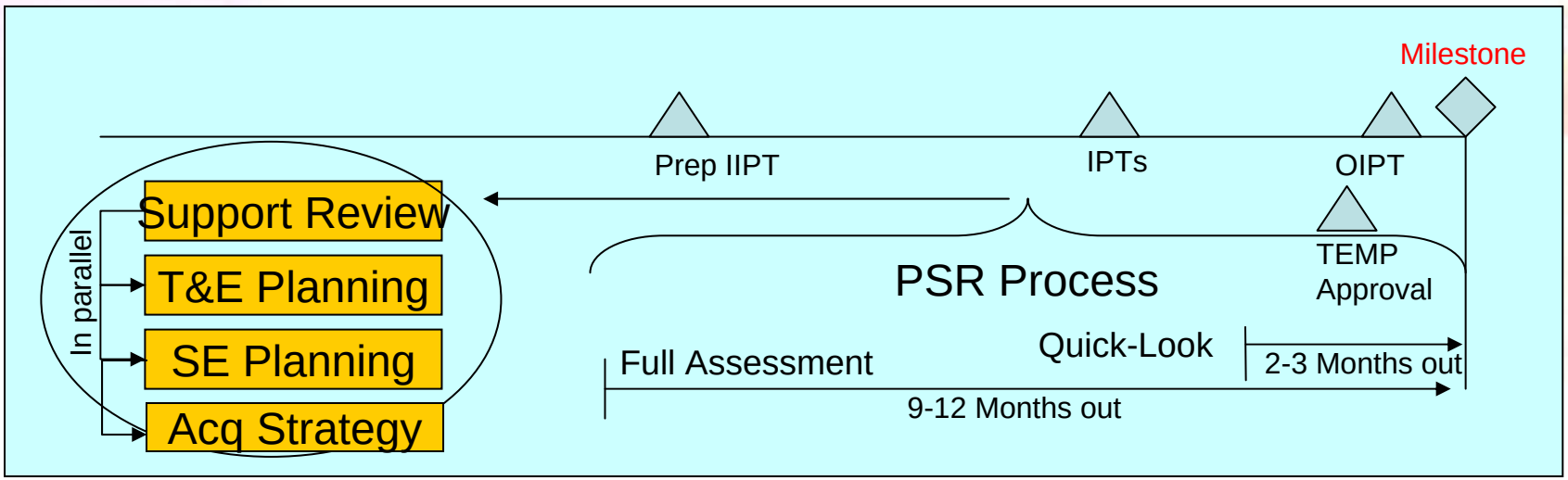


Programs by Domain Area



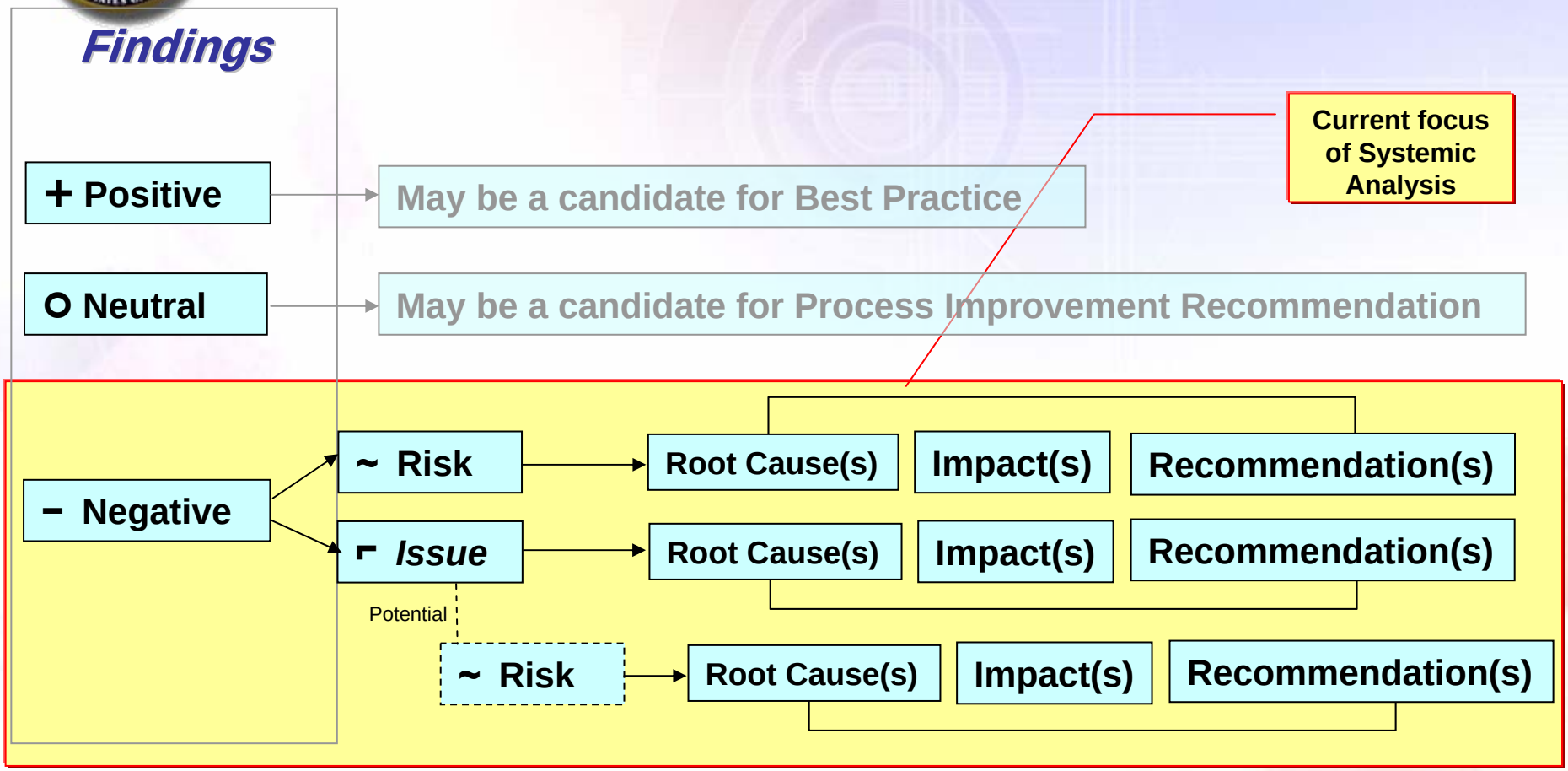
General Approach: Review Products

- The Team's top-level products:
  - Full reviews conducted 9-12 months before Milestone
    - » Detailed findings, risks & actionable recommendations
    - » Conducted in "PM support" vice "OSD oversight" mode
  - "Quick-Look" reviews conducted 2-3 months before Milestone
    - » Same form and formats; Conducted "for record" review
  - Quarterly Defense Acquisition Executive Summary assessments
  - Test & Evaluation Master Plan (TEMP) and Systems Engineering Plan (SEP) development and approval

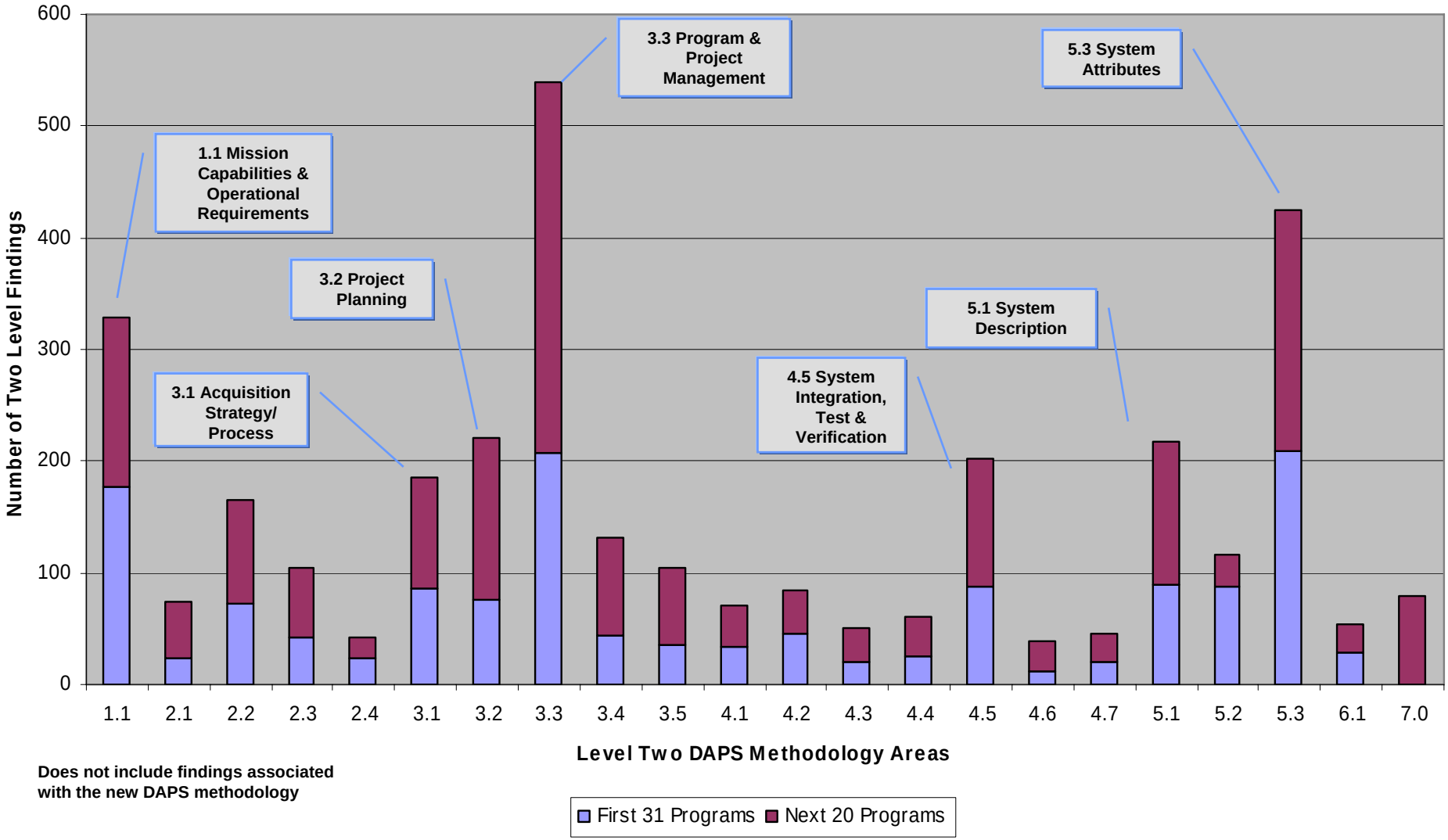


Program Support Review
Taxonomy of Classifications

+ Positive
O Neutral
− Negative
⌐ Issue
~ Risk

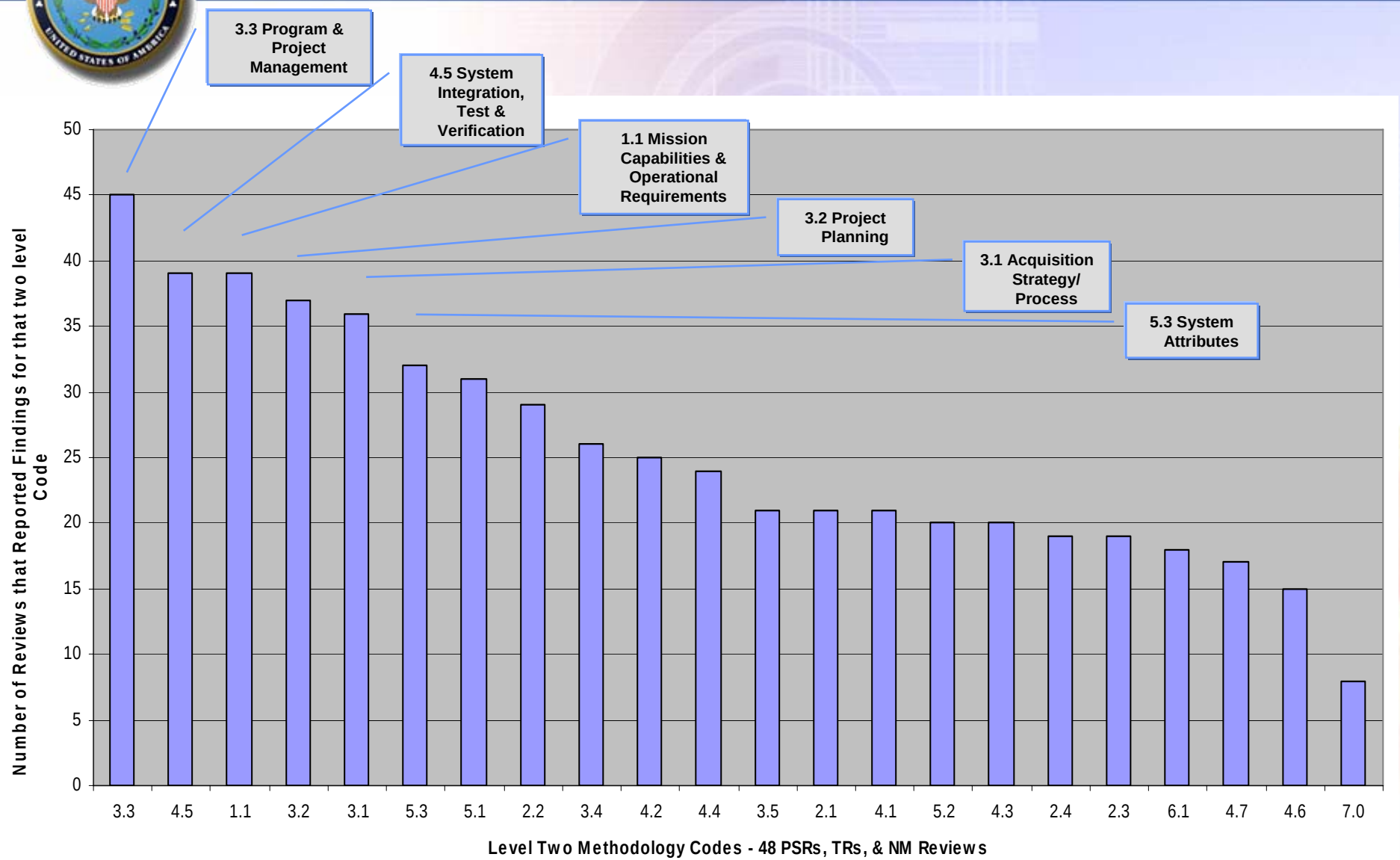


Program Support Review Findings
(March 2004 Through September 2007)



Does not include findings associated with the new DAPS methodology

Program Support Review Findings
(March 2004 Through September 2007)



Representative PSR Findings (1 of 3)

1.1 Mission Capabilities/Requirements

- Lack of reasonable, measurable, and testable requirements
- Requirements refer to “predecessor” systems
- Requirements changes contribute to SE churn
- Lingering requirements issues have increased program costs and risks
- Failure to establish a process for flowing down requirements
- Requirements are not fully understood after contract award
- Lack of growth margins/trade-space

3.1 Acquisition Strategy/Process

- Resistance to demonstrate key functionality by MS C
- Balance between requirements, schedule and resources
- Acquisition strategy doesn’t address key issues

Representative PSR Findings (2 of 3)

3.2 Project Planning

- Schedule vs. event driven programs
- No “time” to conduct the full suite of SE technical reviews
- Lack of Integrated Master Plan/Integrated Master Schedule
- Underestimation of integration efforts and COTS modifications
- Lack of meaningful acquisition phase exit criteria

3.3 Program & Project Management

- Marginal Program Office staffing; Difficult to retain high quality personnel
- Roles, responsibilities, and lines of authority are not clear
- Poor communication across IPTs and program lines
- Lack of management metrics to monitor program health
- EVMS does not provide insight and does not reflect work being done
- Lack of properly documented risks and mitigation plans

Representative PSR Findings (3 of 3)

4.5 System Integration, Test, & Verification

- Highly concurrent test schedules; Success-oriented
- Aggressive schedule lacks adequate time for corrective actions
- Optimistic plans to leverage M&S; Lack of VV&A planning
- Shortage of military operators for operational tests
- Testing and verification approach are inadequate
- Developmental testing not complete prior to IOT&E

5.3 System Attributes

- Insufficient efforts to design-in reliability and maintainability, including diagnostics
- Weak emphasis on suitability contributes to IOT&E issues
- Late production planning; Insufficient Production Readiness Reviews
- Challenging production ramp rates for contractors/suppliers
- Optimistic software productivity, reuse and growth estimates

Thoughts That Need Reinforcement (1 of 3)

- Mission Capabilities/Requirements
  - Ensure CDD/CPD requirements are reasonable, measurable and testable
  - Ensure approved CONOPS informs requirements generation process
  - Maintain stable requirements
  - Conduct cost/performance trades with PM, user and contractors
  - Push high risk requirements to the next increment
  - Conduct SRR in TD phase with contractors
  - Understand COTS/GOTS capabilities and limitations (when operated in a military environment)
  - Be aware of critical dependence on external programs with developmental issues
  - Establish space/weight/power/cooling margins
- Management
  - Balance requirements, resources and acquisition strategy
  - Plan to demonstrate key functionality in SDD phase
  - Maintain event driven schedules; establish entry/exit criteria
  - Use earned value management as a vehicle for planning, executing, and controlling the program
  - Employ a robust risk management process and resource mitigation activities

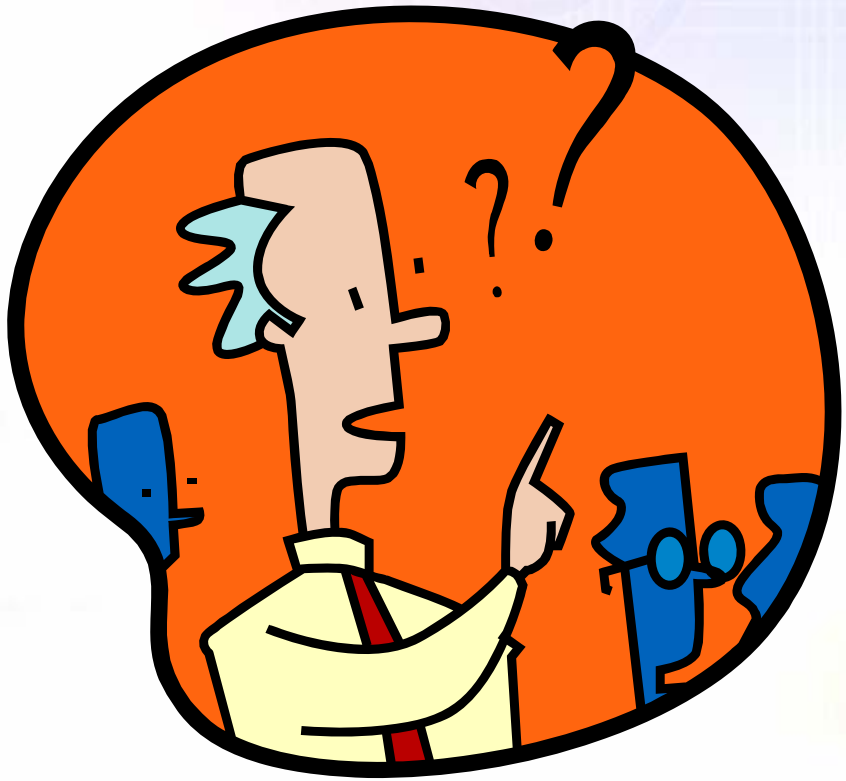
Thoughts That Need Reinforcement (2 of 3)

- Management (cont.)
  - Ensure communication between IPTs; and with Contractor
  - Define IPT roles, responsibilities, authority and conflict resolution process
  - Manage external interfaces; establish issue resolution process
  - Avoid urgency of need outweighing good engineering and program management
- Resources
  - Ensure funding is properly phased and adequate to support planned SE activities
  - Adequately staff the program with qualified personnel
  - Ensure early selection of M&S and plan to VV&A planning
  - Ensure adequate management reserve
- Technical Product
  - Use mature technologies and modular open architecture
  - Assess COTS/GOTS form factor changes and integration challenges
  - Plan to design-in reliability and maintainability
  - Assess supportability in the SDD phase
  - Provide early focus on production planning
  - Use realistic software size, productivity, and reuse estimates
  - Ensure test schedule reflects adequate time for corrective actions and reporting

Thoughts That Need Reinforcement (3 of 3)

- Technical Process
  - Use established SE processes
    - » Full suite of SE technical reviews
    - » Independent chairman and SMEs
    - » Adequate time between technical reviews/SDD events
    - » Maintain technical baselines
    - » Process compliance
  - Ensure translation of operational requirements into contractual language
  - Comprehensive contractual verification (section 4 of spec) of meeting requirements (section 3 of spec)
  - Ensure adequate requirements flow-down/ traceability/ decomposition
  - Put emphasis on test and verification approach
- Environment
  - Ensure consistency in program documentation
  - Be aware of new policies, Congressional language, and certifications

Questions…perhaps Answers



Back-up Slides

Samples of Program Support Review Positive Observations

- Experienced and dedicated program office teams
- Strong teaming between PM offices and contractors
- Use of well defined and disciplined SE processes
- Proactive use of independent review teams
- Successful management of external interfaces
- Corporate commitment to process improvement
- Notable manufacturing processes
- Appropriate focus on performance-based logistics
- Focus on DoD initiatives
- Excellent risk management practices

But not on all Programs…