Performance Assessments and Root Cause Analyses

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Overview

- Performance Assessments
- Root Cause Analyses
- Earned Value Management
- Acquisition Policy Analysis Center

Performance Assessment Functions

- PARCA's PA duties as defined in WSARA
  - SECDEF shall designate a senior official responsible for:
    - Sec 103(b)(1) Carrying out performance assessments of major defense acquisition programs … periodically or when requested by the SECDEF, the USD(AT&L), the Secretary of a military department, or the head of a Defense Agency.

On-going assessments (via DAES)

    - Sec 103(b)(5) Advising acquisition officials on performance issues regarding a major defense acquisition program that may arise--(A) prior to certification under section 2433a … (B) prior to entry into full-rate production; or (C) in the course of consideration of any decision to request authorization of a multiyear procurement contract for the program.

Critical Nunn-McCurdy breaches, FRP, MYP

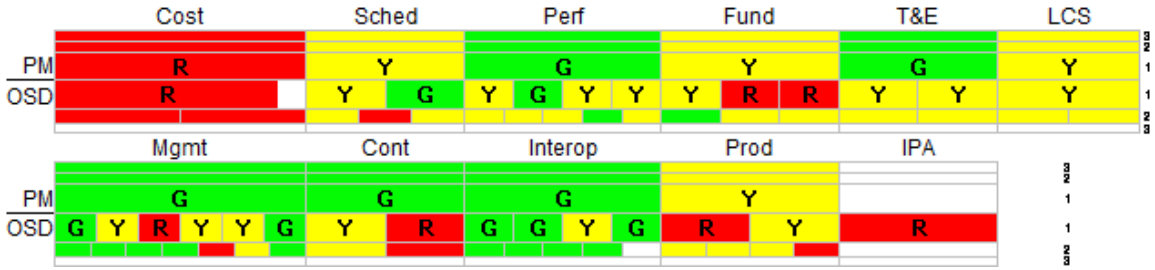
    - Sec 205(c) …shall assess the performance of each major defense acquisition that has exceeded critical cost growth thresholds … but has not been terminated in accordance with section 2433a … not less often than semi-annually until one year after the date on which such program receives a new milestone approval … results of reviews performed under this subsection shall be reported to the USD(AT&L) and summarized in the next annual report of such designated official.

Defense Acquisition Executive Summary (DAES)

- One way PARCA meets its requirement to conduct periodic assessments is through the DAES process
  - Issued DAES Assessment Guidance and Deskbook
- PARCA roles:
  - Assess Contract Performance category for all programs
  - Assess other categories as appropriate
  - Consolidate assessments from all rating organizations
  - Participate in selecting programs to be briefed to DAE
  - Identify critical issues to be addressed in DAE briefings
  - Participate in DAES meetings

DAES Assessments

- OSD and PMs assess programs in 11 categories:
  - Cost, schedule, performance, contract performance, management, funding, test, sustainment, interoperability, production, international



- Assessments document programs' status and history, are stored on a shared website, and are read by all levels of staff and leadership
- EV data is used in:
  - *Contract Performance:* EVM and IMS data are the core of contract performance assessments
  - *Management:* Lack of EVM data or EVM systems problems can produce negative ratings
  - *Cost:* EVM data aggregated across contracts shows program cost status
  - *Schedule:* EVM data, with IMS data and program milestones is often part of schedule assessments

Root Cause Analysis Functions

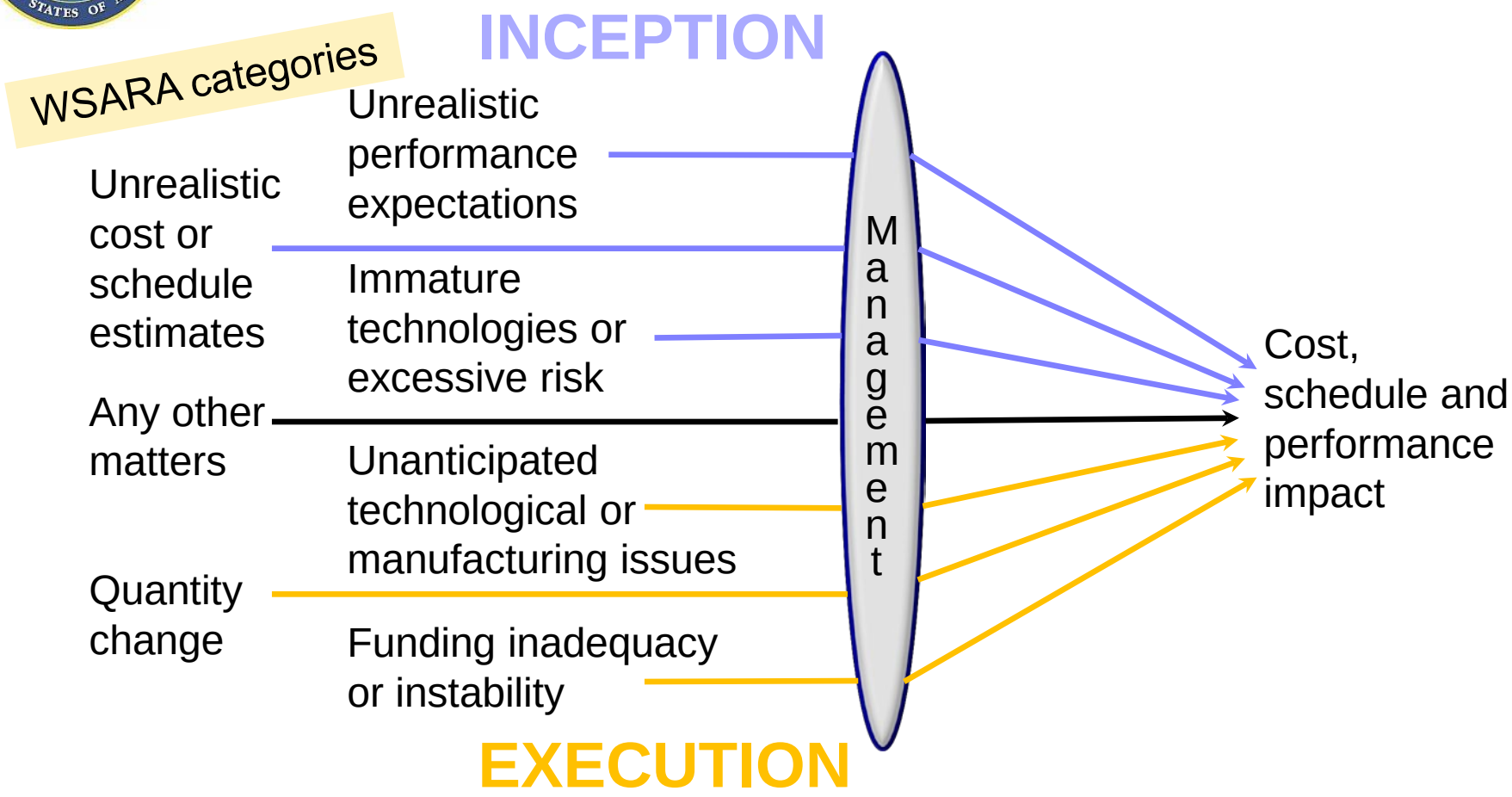
- PARCA's RCA duties as defined in WSARA
  - The SECDEF shall designate a senior official responsible for:
    - Sec 103(b)(2) Conducting root cause analyses for major defense acquisition programs in accordance with th requirements of subsection (d) when required by sec 2433a(a)(1) of title 10, United States Code (as added by section 206(a) of this Act), or when requested by the SECDEF, the USD(AT&L), the Secretary of a military department, or the head of a Defense Agency.

Critical Nunn-McCurdy breaches

Others as assigned

    - Sec 103(b)(3) Issuing policies, procedures, and guidance governing the conduct of performance assessments and root cause analyses by the military departments and the Defense Agencies.

Root Cause Analysis Framework



In our business, problems will occur — why they occur and our response to them are subjects of root cause analysis

PARCA RCA Findings, 2010-2014

Inception issues	WGS	ATIRCM	CMWS	RMS	AB3	DDG-1000	JSF	Excalibur	ACWA	RQ-4A/B GH	Navy ERP *	GCSS-MC *	JTRS GMR	FAB-T **	JLENS	P-8A *	EELV	ECSS *	JPALS	VTUAV	Totals
Unrealistic performance expectations		X																X			2
Unrealistic baseline estimates for cost or schedule							X		X	X	X	X									5
Immature technologies or excessive manufacturing or integration risk		X											X								2
Other												X						X			2
Execution issues																					
Unanticipated design, engineering, manufacturing or technology integration issues arising during program performance	X		X																	X	3
Changes in procurement quantity					X	X		X							X						4
Inadequate program funding or funding instability																					0
Poor performance by government or contractor personnel responsible for program management				X			X			X	X	X	X	X			X	X			9
Other	X																X		X	X	4
RCA Memo Year (FY)	2010								2011								2012	2013	2014		

* Indicates a discretionary root cause analysis

PARCA RCA's and FFRDC reports (public site): http://www.acq.osd.mil/parca/references.shtml
PARCA FFRDC FOUO reports (CAC-restricted site): https://extranet.acq.osd.mil/parca/cac-only.shtml

Challenge: distinguishing between "root" causes and symptoms or consequences

Quantity Changes

- To consider a quantity change to be a root cause, PARCA has defined two conditions:
  - The reason for the change was outside the control of the acquisition community.
    - Doctrinal or threat change
    - "Pure" fiscal constraints

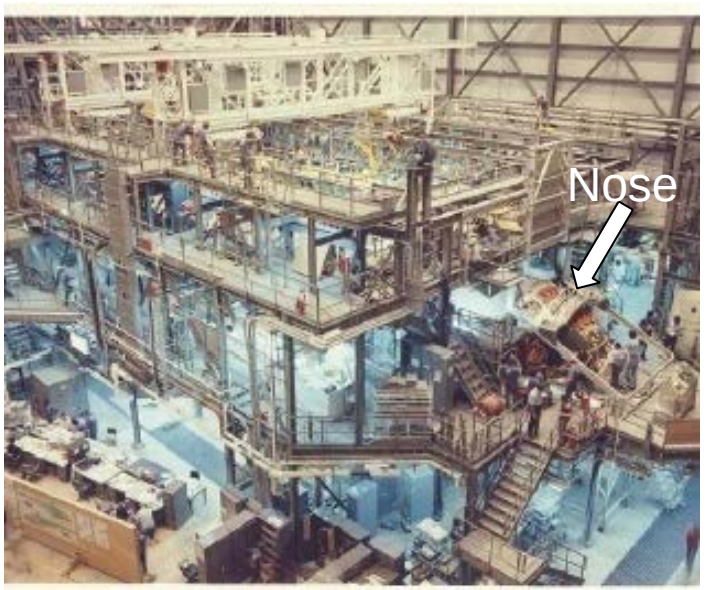
    but NOT

    - Escalating unit costs
    - Schedule slips
  - Other cost growth would not have caused a breach without the quantity change
- PARCA has found that quantity changes were due to factors within acquisition community's control in about half of the cases

Why are Estimates Unrealistic?

- Unrealistic estimates are generally caused by the invalidity of major assumptions NOT methodological errors

Orbiter Processing Facility Concept (1974)



Actual Orbiter Processing Facility

- The cost estimating community can and should challenge assumptions but the acquisition community formulates them

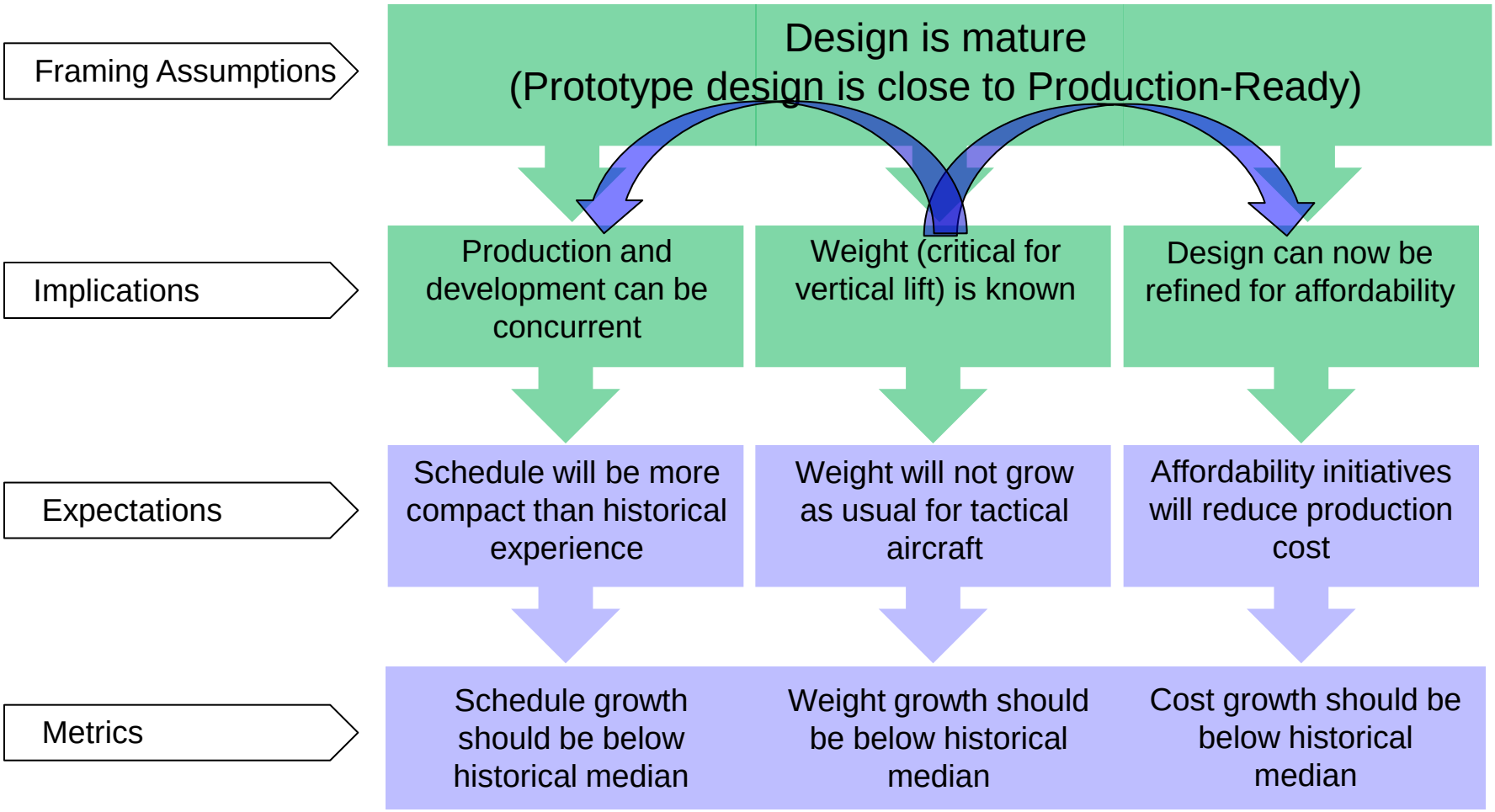
This has led to a concept called “Framing Assumptions”

Framing Assumptions: Definition and Characteristics

Framing Assumption: any supposition central in shaping cost, schedule, or performance expectations of an acquisition program

- A program generally should have a small number of Framing Assumptions with the following attributes:
  - Critical: Significantly affects program expectations
  - No work-arounds: Consequences cannot be easily mitigated
  - Foundational: Not derivative of other assumptions
  - Program specific: Not generically applicable to all programs

When a Framing Assumption is invalid, there will be signals



Uses for Framing Assumptions

- Generally:
  - Remind us of the “big bets”
  - Create metrics that matter to the big picture
  - Help us understand the implications of metrics that don’t track as expected

- Good for leaders, good for PMs:
  - Create framework for DAB discussions and MDA decisions
  - Create metrics enabling assessment of program execution

Illustrative Sources for Framing Assumptions

Cost/schedule/requirements trade-offs: The design is very similar to the prototype or legacy system.

Technological or Engineering: Modular construction will result in significant cost savings.

Managerial or Organizational: Arbitrating multi-Service or international participation will be straightforward.

Program interdependencies: FCS will facilitate solution of size, weight, and power issues.

Contractual terms/incentives: Contract type and/or incentives are suitable to deliver specific expected outcomes.

Industrial base/market: The satellite bus will have substantial commercial market for the duration of program.

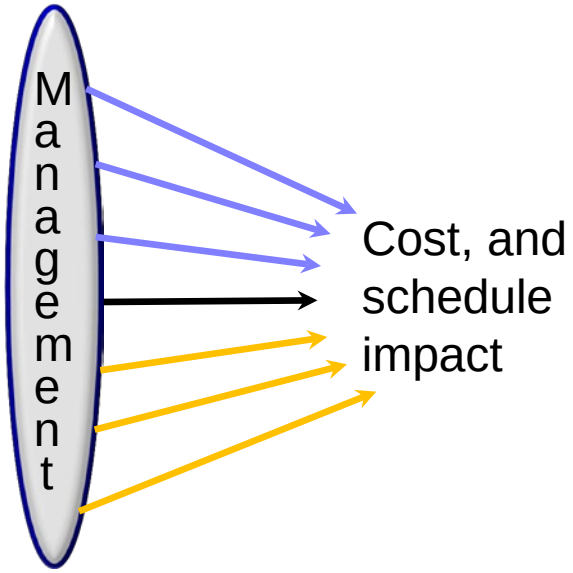
Program now

Program future

Program Environment

Poor Management Performance

- Issues/problems should always be examined through lens of management performance
  - Contractor
  - Program Office
  - PEO
  - OSD
- PARCA has found issues in three broad areas
  - Systems engineering
  - Contractual incentives
  - Organizational awareness and response

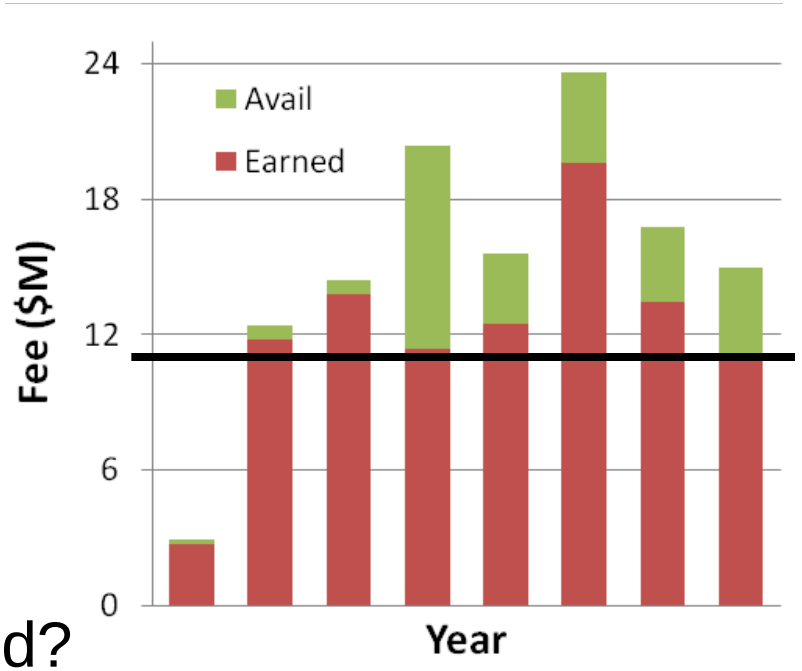


Systems Engineering

- General observations
  - High potential to be a root cause because SE is critical for complex systems
  - Recognizing poor systems engineering early is a challenge
  - “Systems Engineering” too broad for actionable root causes
- Problems have been observed in:
  - Requirements management
    - Ambiguities in combining requirements documents
    - Development, translation and allocation of requirements
    - Adequately funding program to include all requirements
  - Interface and environment management
  - Holistic performance attributes e.g., reliability, weight
  - Risk assessments

Effective Contracting Strategy

- Incentive evaluation
  - Aligned with program goals and challenges
  - Demanding yet achievable
  - Sufficient to motivate
  - No perverse effects
  - Correct signal sent and received
- Incentive strategy
  - Are conditions for strategy satisfied?
  - Consistent with corporate goals and position?
  - Consistent with policy?



Government's goals must be viewed from contractor's perspective

Acquisition Policy Analysis Center: Data-Driven Policy Analysis

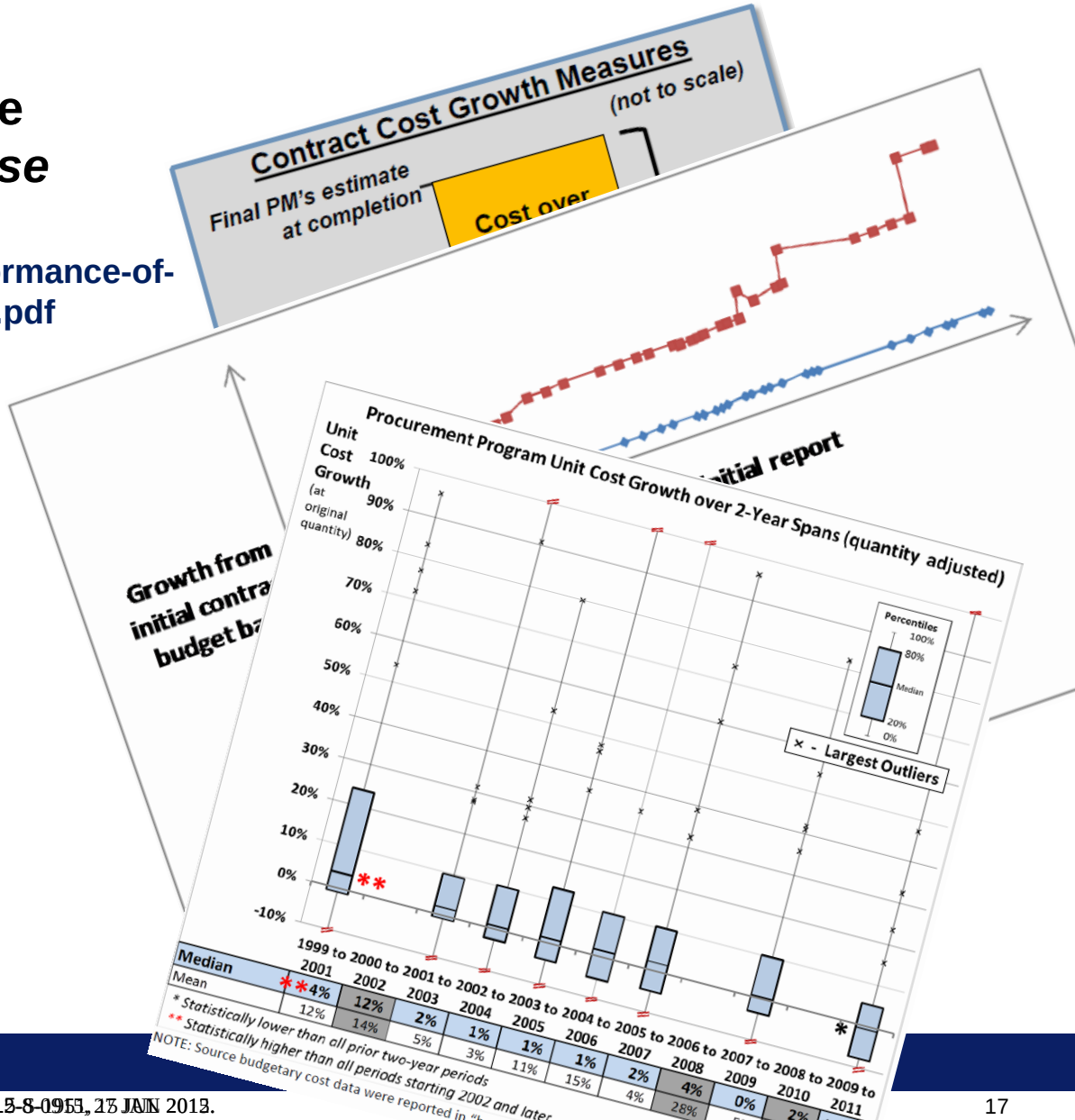
- **2014 Annual Report on the *Performance of the Defense Acquisition System***
  - **http://www.acq.osd.mil/docs/Performance-of-Defense-Acquisition-System-2014.pdf**

PERFORMANCE OF THE
DEFENSE ACQUISITION SYSTEM

2014 ANNUAL REPORT

JUNE 13, 2014

Approved for public release; distribution unlimited



Affordability Myths

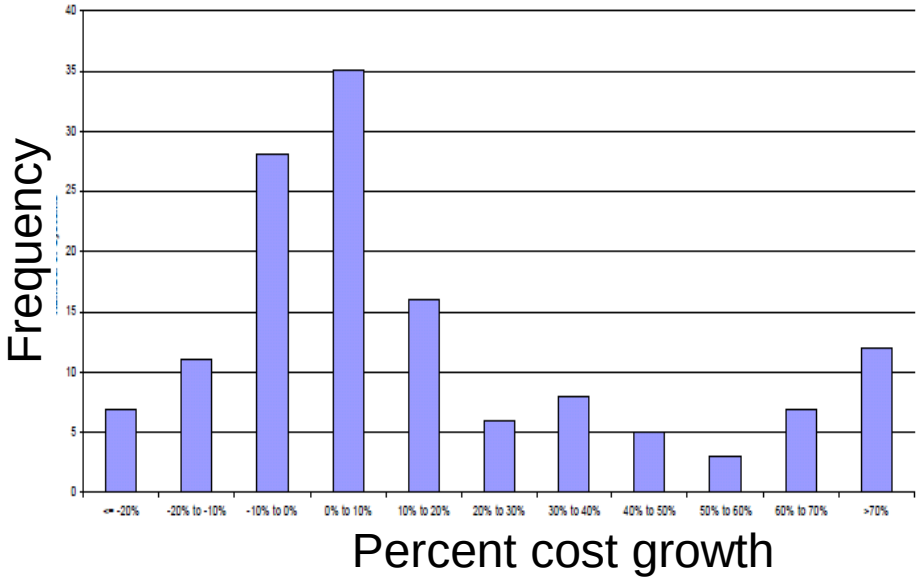
1. **Affordability = cost control tools (should-cost, CAIV, etc.)**
2. **Constraints are based on cost estimates**
3. **Affordability is determined by the Acquisition Community**
4. **Affordability = absolute program importance**
5. **Constraints are permeable objectives**

PARCA sponsored analyses

- Program Performance Assessments
- Root Cause Analyses
- EVM Competence
- Essential Views on IPMRs
- Framing Assumptions
- Tying Contractor Incentives to Performance
- Acquisition Workforce Management
- Systems Engineering Metrics
- Cost Growth Studies

Closing Comments

- PARCA's observations
  - Problem cost growth comes from inception and execution issues
  - Inception issues are often due to invalid postulates (Framing Assumptions)
  - In execution, DoD often fails to recognize implications of postulate invalidity and is slow to identify and respond to evidence of invalid postulates and managerial or organizational problems



Recognizing problems is the first step to solving them

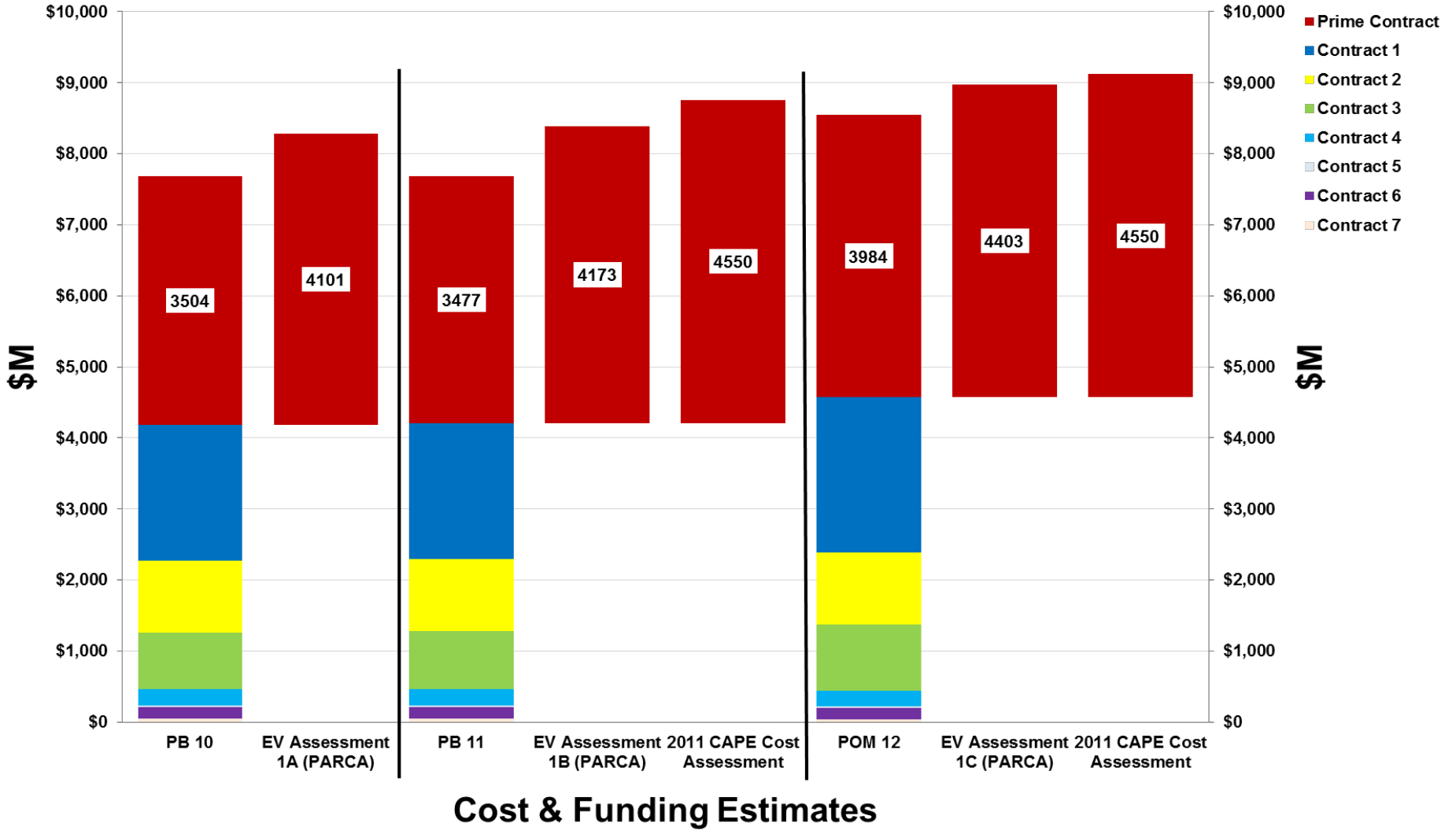
Backup

Early indication of schedule slips

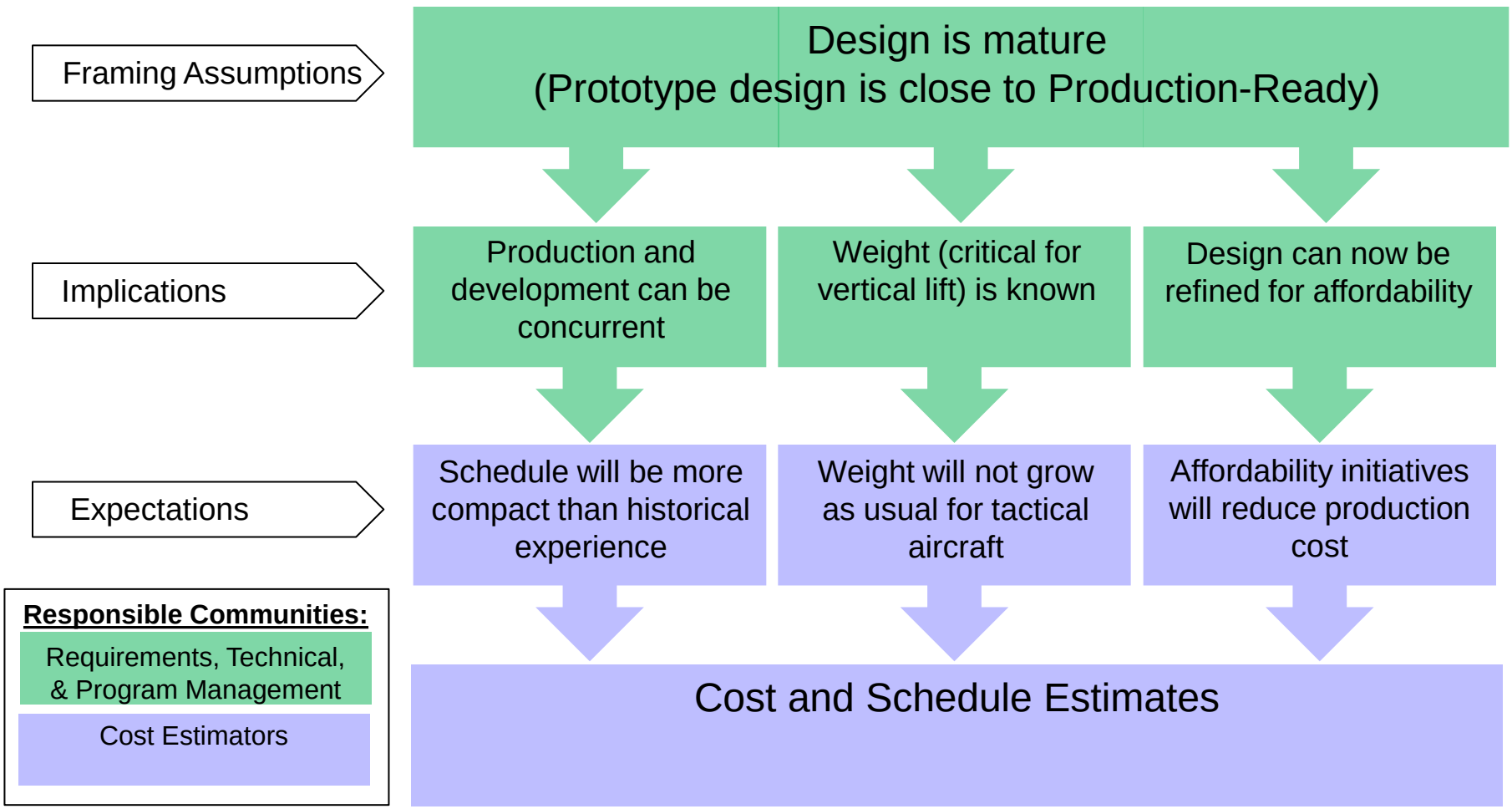
- Program's IOC had slipped several years
- Goal was to bring IOC milestone back by compressing time to First Flight and completing Test Article Assembly and IOT&E several months ahead of schedule
- PARCA worked w/PMO to identify 5 IMS items important to FF and Assembly
- Tracking those items provided early indications that FF and Assembly would slip

Key IMS Activity 1						
	Month 3	**Month 6**	**Month 9**	**Month 12**	**Month 15**	**Month 18**
Forecast Start	6/12/2013	6/27/2013	7/12/2013	7/27/2013	8/11/2013	8/26/2013
Forecast Finish	6/30/2013	7/15/2013	7/24/2013	8/14/2013	9/15/2013	9/15/2013
Baseline Finish	7/5/2013	7/5/2013	7/5/2013	7/5/2013	7/5/2013	7/5/2013
Total Float	15 days	10 days	5 days	0 days	-5 days	-15 days
Forecast Duration	18 days	18 days	13 days	19 days	35 days	20 days
Finish Variance	6 days	-9 days	-19 days	-40 days	-71 days	-71 days

Tracking cost growth / funding shortfalls



Cost Estimating Assumptions Flow from a Program's "Framing Assumptions"



Performance Metrics Functions

- PARCA's statutory duties are defined in WSARA 09
  - SECDEF shall designate a senior official in OSD responsible for:
    - Sec 103(b)(4) Evaluating the utility of performance metrics used to measure the cost, schedule, and performance of major defense acquisition programs, and making such recommendations to the Secretary of Defense as the official considers appropriate to improve such metrics.

PARCA conducts studies to improve DoD's capability to assess programs and understand causes of poor performance