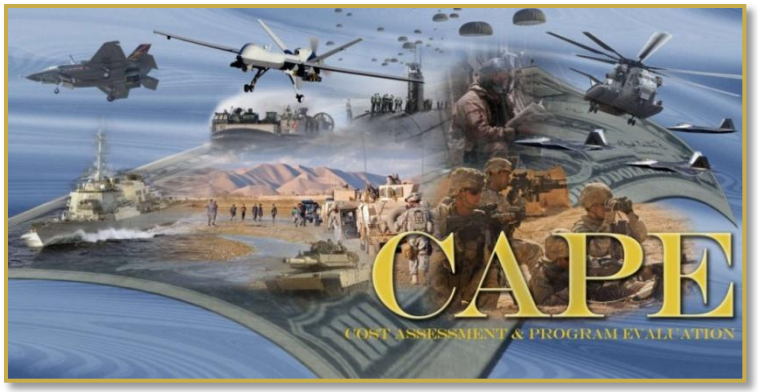
Depot Maintenance Requirement Studies

for

2010 DOD Maintenance Symposium
Breakout Session: Programming Challenges



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Bottom Line Up Front

- Studies
  - Devised Common Graphic Interface (*CGI*)
  - Defined aircraft requirement metrics based on Services' force structure and weapon system operational standards
  - Applying the CGI methodology to Ground Vehicles
  - Launch software study
  - Receive sample software requirements data and metrics
- Scheduled Impact on SNaP OP-30
  - *POM 2011* Added *depot* level data
  - *POM 2012* Will begin to include aircraft requirement metrics.
  - *POM 2013* Will begin to include requirement metrics for Ground Vehicles & software maintenance

Outline

- Purpose: Overview of Depot Maintenance Study

- Topics
  - Introduction
  - Studies
    - Ground Combat Vehicles and Aircraft Studies
    - Common Graphic Interface (*CGI*)
    - Software Study
  - Summary

Business Case

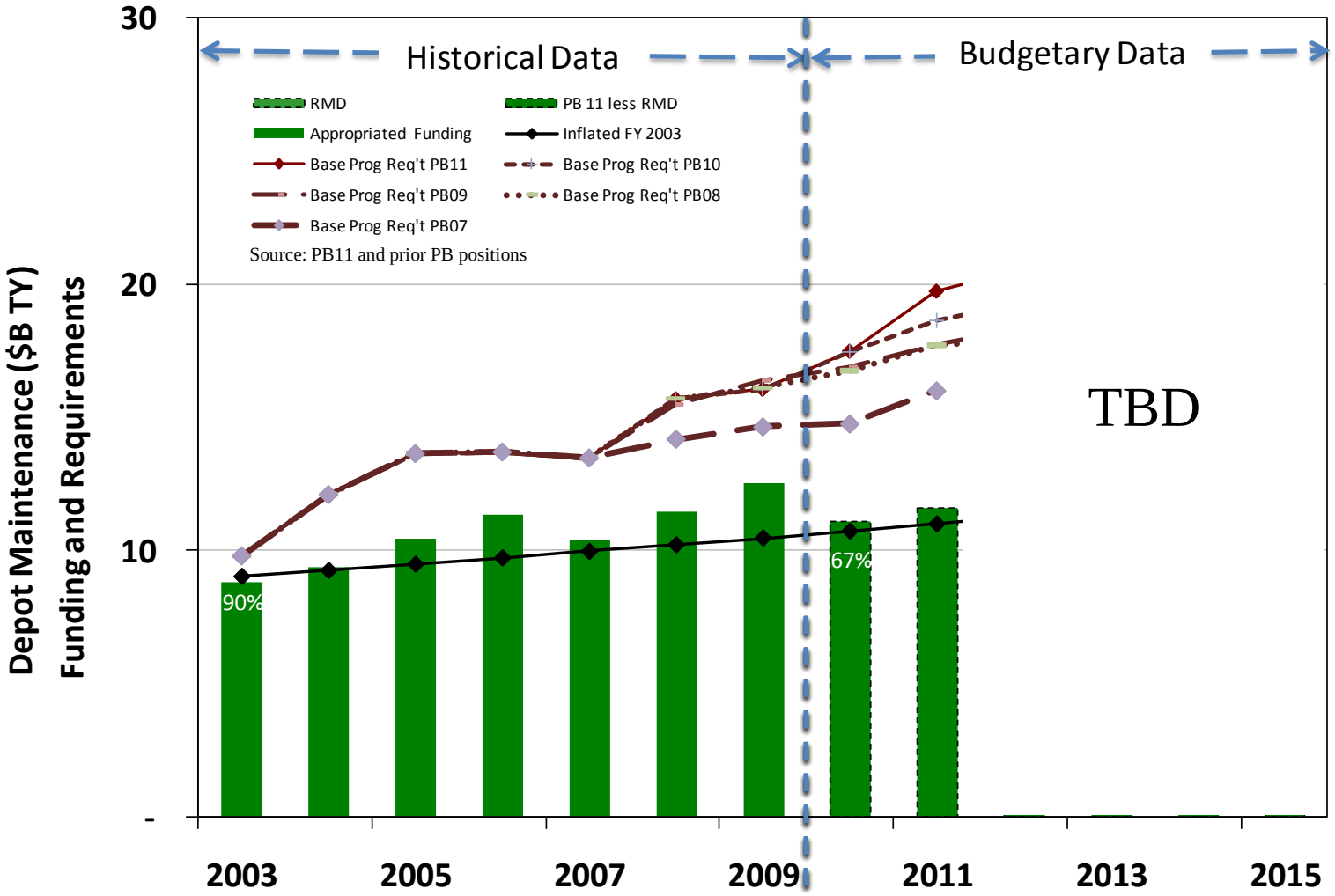
- Problem
  - Services must have appropriate level of funding support to effectively meet the warfighters' needs. Depots will benefit from a common method of reporting depot projected requirements to DoD.
  - DoD leadership lacks the ***clarity*** to quickly and effectively evaluate capability/risk regarding depot maintenance investment to effectively meet the warfighters' needs. This hinders programming decisions.
- Goal
  - Improve the ***clarity*** of the depot maintenance requirements projection to support the Planning Programming Budget Execution System (PPBES)

Strategy

- Leverage existing programming and budget process
- Allow Services to shape the measurement that relates depot maintenance to equipment readiness

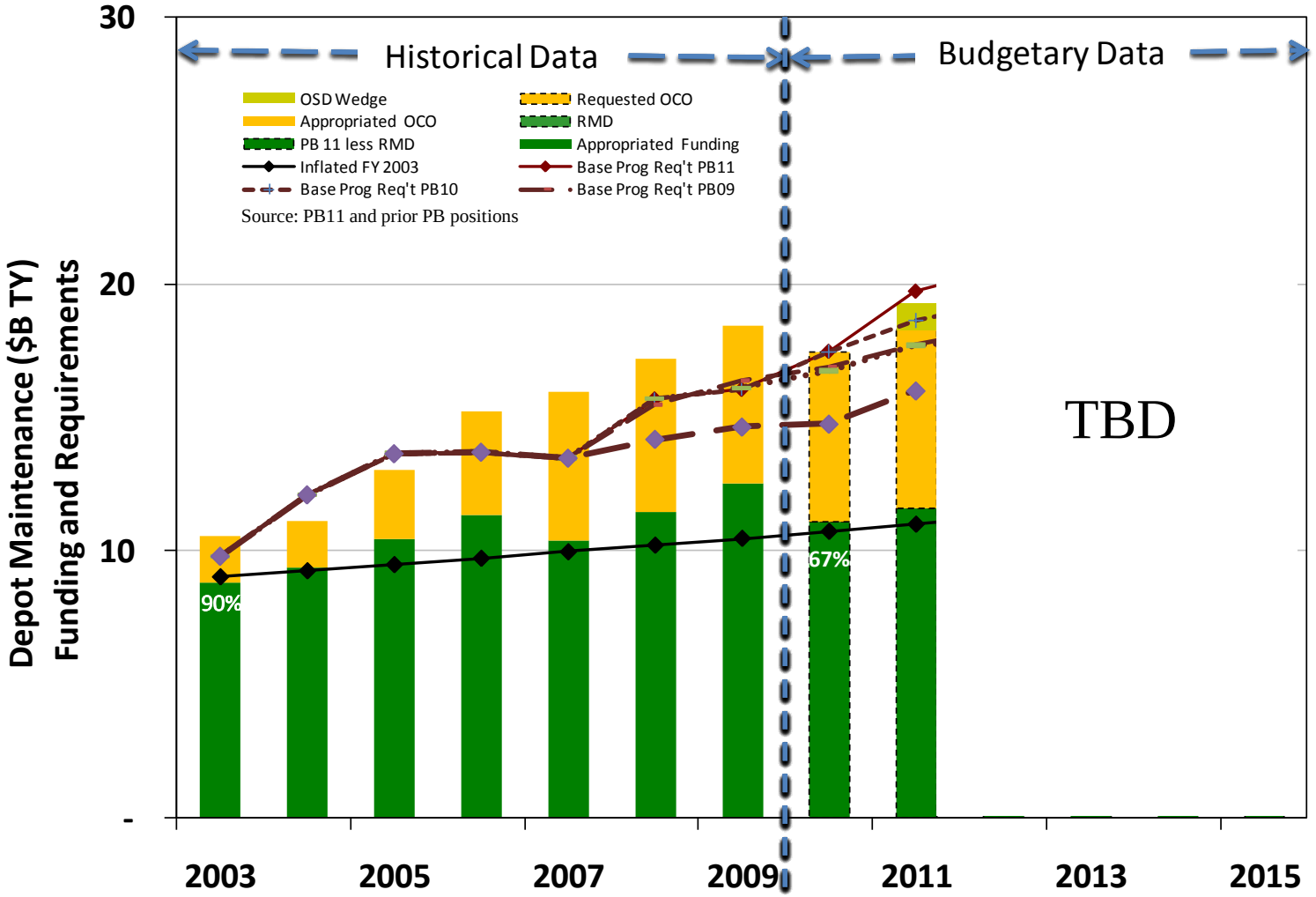
DOD Depot Maintenance Account

OSD



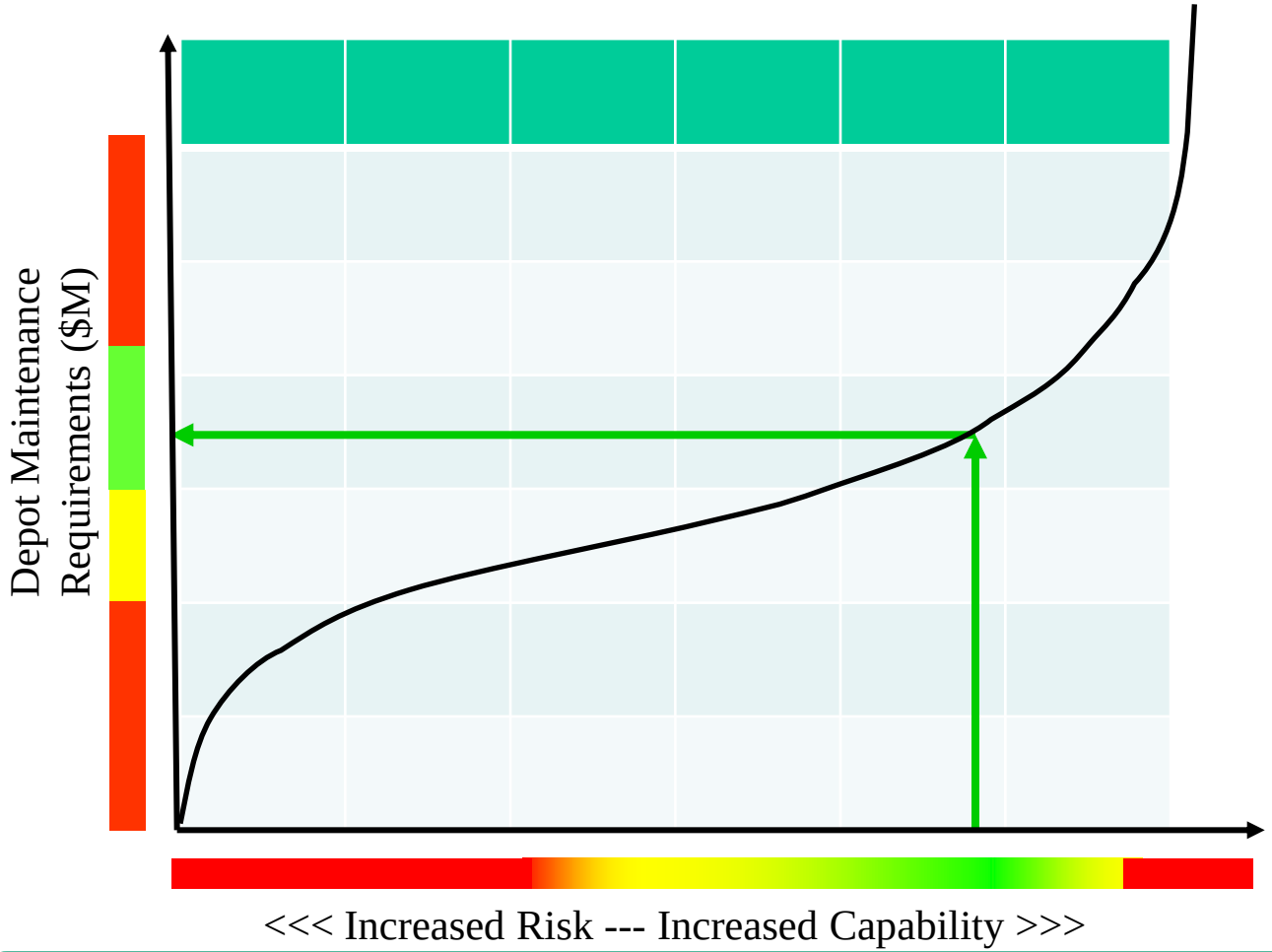
DOD Depot Maintenance Account

OSD



Must re-establish DMx base program.

Common Graphical Interface (*CGI*)



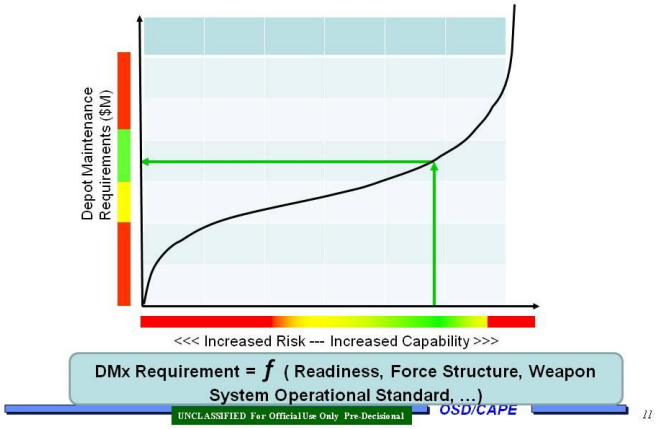
DMx Requirements = *f* (Readiness, Force Structure, Weapon System Operational Standard, …)

Collaborative Results of the Aircraft Study

OSD

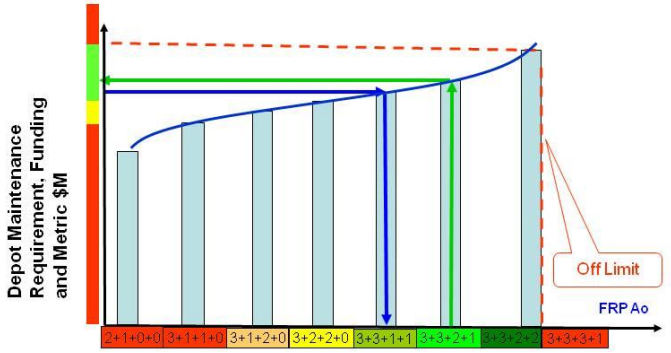
DRAFT

Common Graphical Interface (CGI)



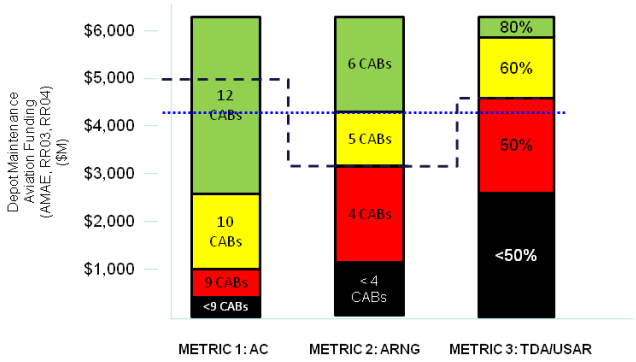
Navy AVN Depot Maintenance

Notional Data



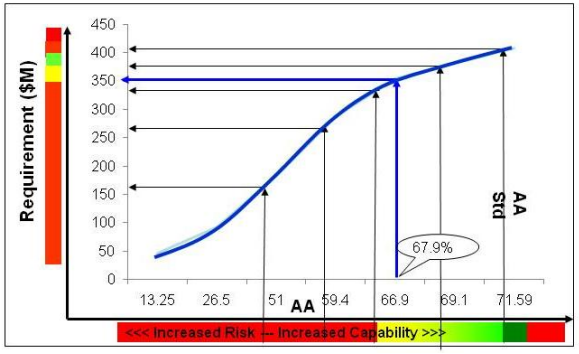
AVN Depot Maintenance – Impact on ARFORGEN Readiness

Notional Data



Capability Based Programming

Notional Data



Collaborative results from the CPI conference at WR-ALC in February 2009 and follow-on meetings

Aircraft Common Metrics

OSD

Capability Requirements <=> $$$

Common Graphical Interface (CGI)

Aircraft Availability (AA)	Mission Capability (MC)	Ready for Tasking (RFT)
USAF *AEF*	USA *CAB*	USN/USMC *CVW*

AA: Aircraft Availability
AEF: Air Expeditionary Force
GR: Global Reach; GP: Global Power
GV: Global Vigilance

MC: Mission Capability
CAB: Combat Aviation Brigade

RFT: Ready for Tasking
CVW: Carrier Air Wing

Services assess the health of individual weapon systems in that mission area against their respective operation standard, i.e. aircraft availability (AA), ready for tasking (RFT), or mission capability (MC).

FY 20XX Aviation DMx Portfolio

Notional Data

OSD

In Work

Reduced Req't Flying Hrs	Reduced Req't DMx/SE	3+3+2+2 $XXX M	PY Accu Deferred	CY Deferred	Reconstitution Cost	Reconstitution Time
(18,922) (1.1%)	($61M)	3+3+2+1 $XX1 M	160 AF 235 EN	57 AF 81 EN	$68M	X1 YR
(27,422) (1.6%)	($89M)	3+3+1+1 $XX2 M	160 AF 235 EN	82 AF 118 EN	$98M	X2 YR
(36,461) (1.7%)	($118M)	3+2+2+0 $XX3 M	160 AF 235 EN	107 AF 162 EN	$130M	X3 YR
(78,231) (4.5%)	($259M)	3+1+2+0 $XX4 M	160 AF 235 EN	230 AF 365 EN	$284M	X4 YR
(127,416) (7.4%)	($341M)	3+1+1+0 $XX5 M	160 AF 235 EN	287 AF 598 EN	$375M	X5 YR
(221,029) (12.9%)	($405M)	2+1+0+0 $XX6 M	160 AF 235 EN	314 AF 1050 EN	$445M	X6 YR

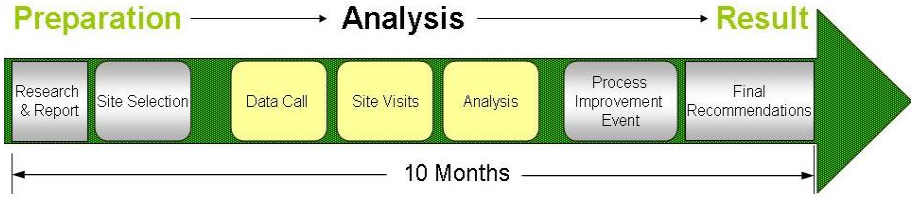
Legend:
AF: Airframe EN: Engines SE: Supporting Engineering #+#+#+# Fleet Readiness Plan

Data for illustration purposes, does not reflect actual values.

Depot Maintenance Requirement Studies

OSD

- Purpose: Provide decision makers with a tool that provides clarity to *quickly and effectively* evaluate capability/risk regarding depot maintenance investment.
- Prior Year Studies
  - Ground Combat Vehicles (2008) and Aircraft (2009)
  - Devised Common Graphic Interface (*CGI*)
  - Efficiency Improvement: Reduced 89% of cycle time (from 28 to 3 days)
  - Defined aircraft requirement metrics based on Services' force structure and weapon system operation standards



- Current Year and Future Studies
  - Software (2010), Ships (2011), Missiles, Ordnance and Munitions (2012), Electronics and Communications (2012-2013)
- Joint efforts
  - OSD(CAPE), OUSD (AT&L) / ASD(L&MR) / ADUSD(MPP), and OSD(C)

Definition of Software Depot Maintenance (SW DMx)

Working Progress

OSD

The USC 10,Section 2460 defines depot-level maintenance as:

"… regardless of the source of funds for the maintenance or repair or the location …*all aspects of software maintenance* classified by the Department of Defense as of July 1, 1995, as depot-level maintenance and repair…"

Activities of depot software maintenance following hardware initial operating capability (IOC) must be reported regardless of location or funding source with exception as listed in Title 10 USC, Section 2460, via the annual SNaP OP-30 programming and budgeting process. Depot-level software maintenance includes all activities to correct faults, improve performance, adapt the software to environmental changes or new requirements, or maintain operational capability:

(1) Changes made to operational software resident in military materiel (including weapon systems and their components and space control systems and their components) as well as the associated software technical data, ATE, including ITA and TPS, and laboratory support (simulation or stimulation software, data acquisition or reduction software); and

(2) Infrastructure maintenance which includes the purchasing of license agreements, maintaining standards for certification and accreditation (C&S) to operate safely, and information assurance vulnerability assessments (IAVAs), etc.

ISO/IEC 14764 and IEEE 14764-2006 defines the repair activities as follows:

- Fixes:
  - Corrective maintenance successfully repairs faults discovered in the software.
  - Preventive maintenance correct latent faults in the software.
- Upgrades:
  - Adaptive maintenance incorporates changes made necessary by modifications in the software or hardware (operational) environment of the program.
  - Perfective maintenance incorporates changes demanded by the users.

Software Study Schedule

	Comp Date
▪ Apply study methodology to Services' software assets	Dec 2009
– Understand Services' requirements generation process	
– Receive sample requirements data and metrics	
– Add sample data to the OSD Data Warehouse Test Bed	
▪ Visit Services' depots	Feb 2010
– TBD	
▪ Hold Process improvement event if needed	Fall 2010
▪ Expanding and improving requirement metrics	Fall 2010
▪ Complete study for POM 2013	Mar 2011

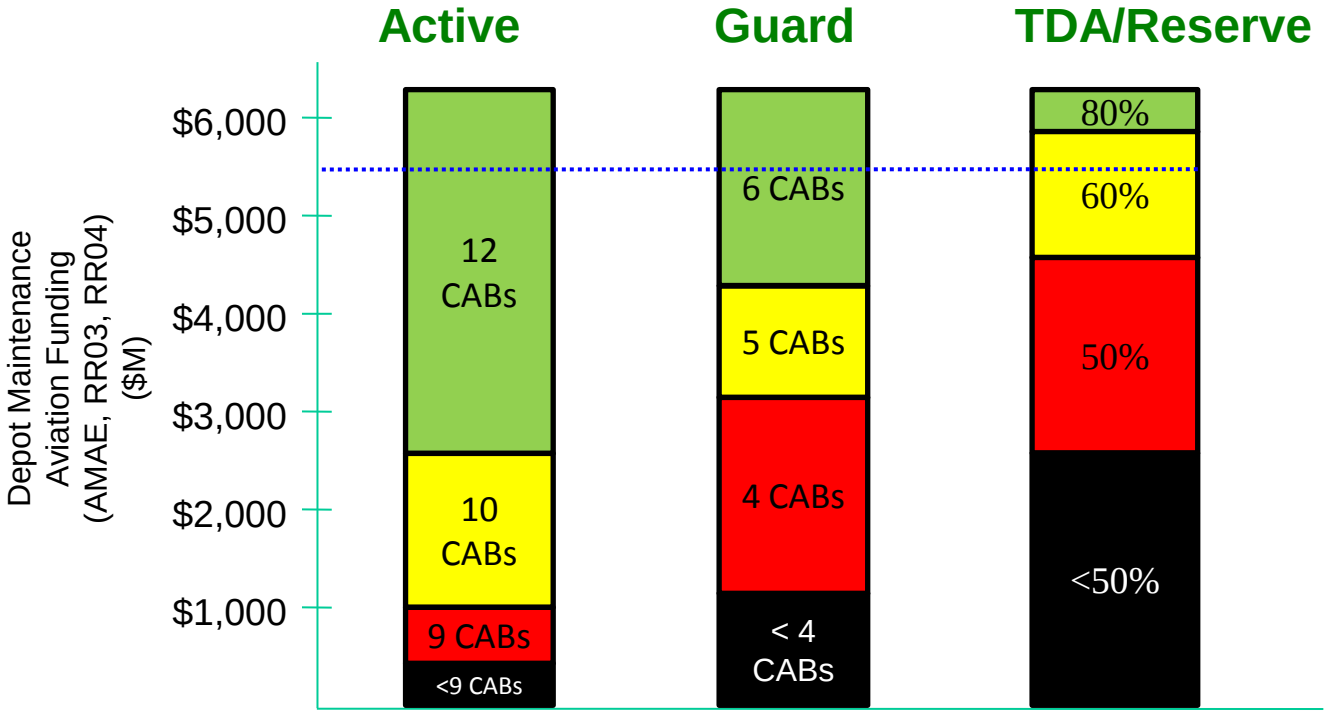
Summary

- Depot maintenance base program must be re-established.
- Front-end studies on maintenance requirements
  - Devised Common Graphic Interface (*CGI*)
  - Defined metrics of aircraft DMx requirements based on Services' force structure and weapon system operational standards
  - Applying the CGI methodology to Ground Vehicles and software
- Scheduled Impact on program/budget Process - SNaP OP-30
  - *POM 2011* Added *depot* level data
  - *POM 2012* Will begin to include *aircraft* requirement metrics.
  - *POM 2013* Will begin to include requirement metrics for ground vehicles & software maintenance.

Tab A. Aircraft Study

AVN Depot Maintenance – Impact on ARFORGEN Readiness – FY 2010-15

Notional Data



METRIC 1:
# of AC CAB(H), CAB(M) Fully Ready EOH and MC Meeting ARFORGEN Requirements

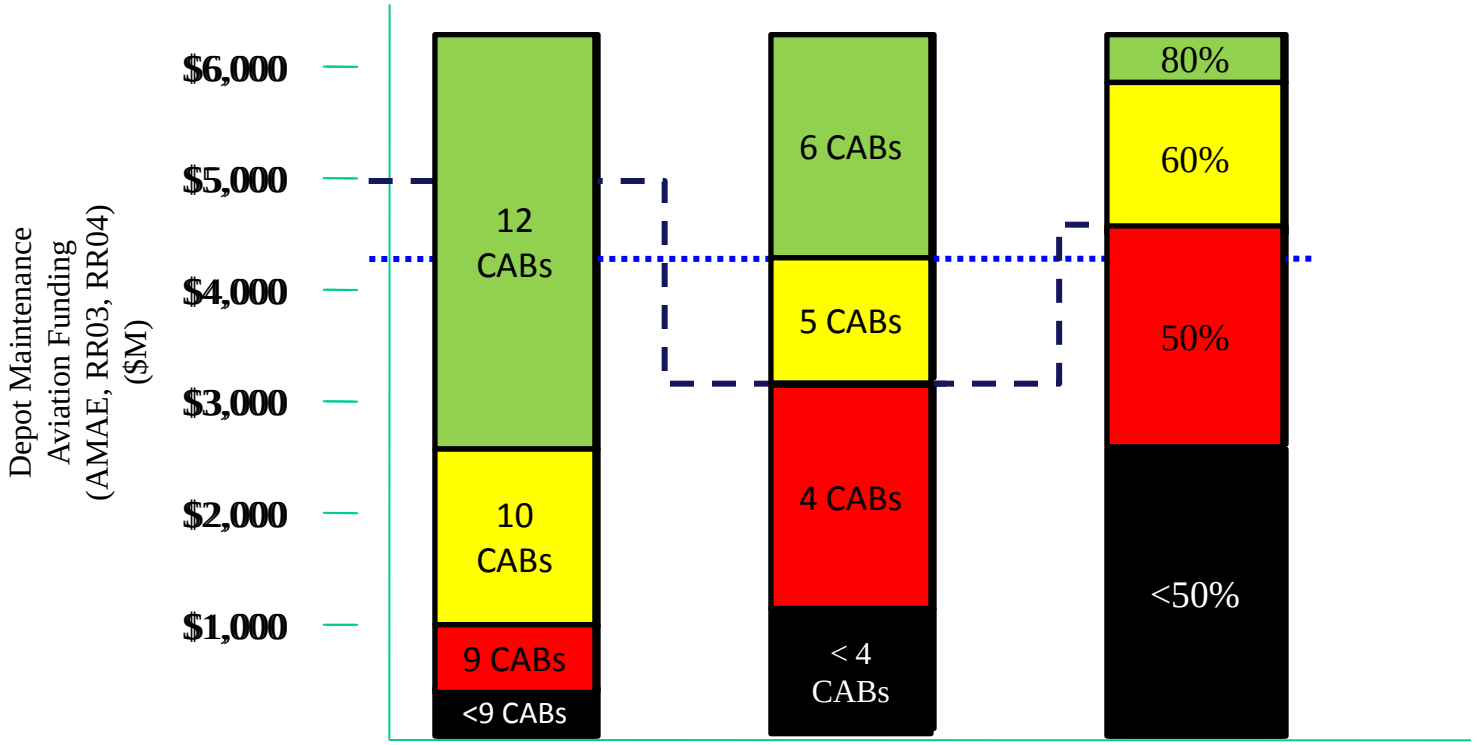
METRIC 2:
# of NG CAB(E) Fully Ready EOH and MC Requirement: 6

METRIC 3:
% of TDA/USAR Aircraft Fully Ready EOH and MC Requirement: 80%

Data for illustration purposes, does not reflect actual values.

AVN Depot Maintenance – Impact on ARFORGEN Readiness

Notional Data



METRIC 1: AC
# of AC CAB(H), CAB(M)
Fully Ready
EOH and MC

Meeting ARFORGEN Requirements

METRIC 2: ARNG
# of NG CAB(E)
Fully Ready
EOH and MC

Requirement: 6 CABs

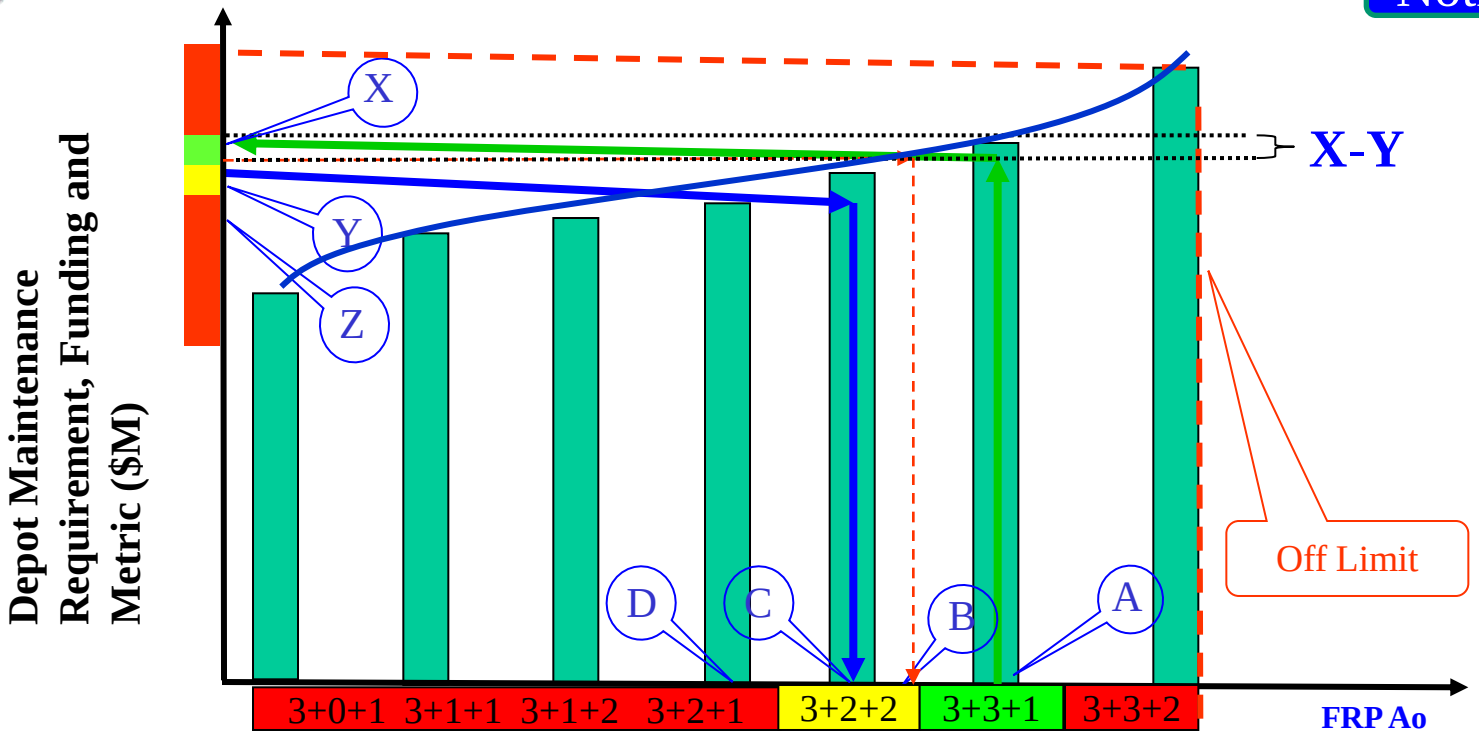
METRIC 3: TDA/USAR
% of TDA/USAR Aircraft
Fully Ready
EOH and MC

Requirement: 80%

Data for illustration purposes, does not reflect actual values.

Navy AVN Depot Maintenance

Notional Data



- Fleet Response Plan optimum Availability (FRP Ao) level defines the Naval mission. Navy identifies (**A:** 3+3+1) => **(X:** $1,440M**)**

- If requirement is funded at a lower level ($1,400M), the risk associated with achieving 3+3+1 increases until the point B where the minimum amount of hardware isn't available and we move to point C. **(X-Y) ($90M),** is the trade space where risk replaces dollars or vice versa**.**
- C is FRP Ao 3+2+2 => (Y: $1,350M)
- D is FRP Ao 3+2+1 => (Z: $1,295M)

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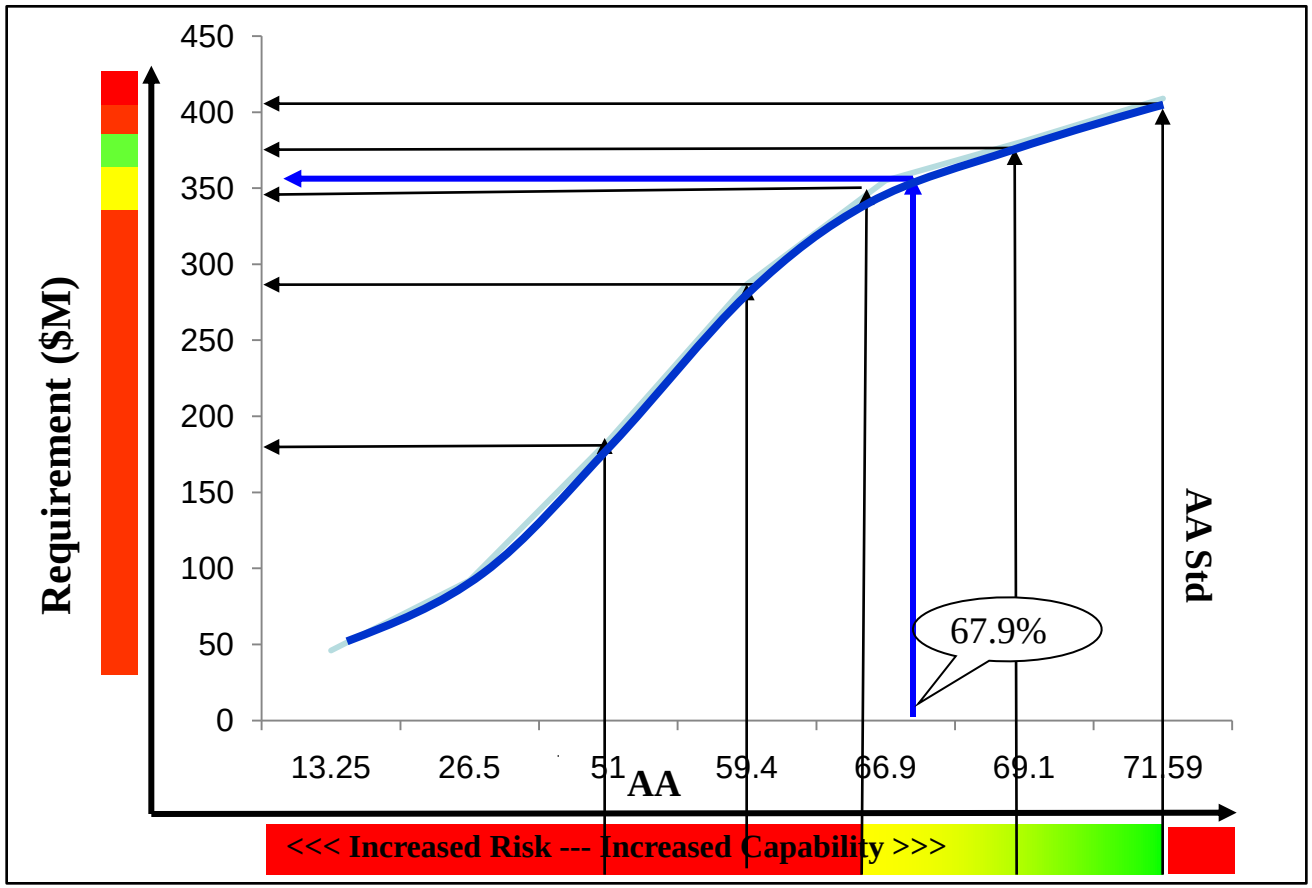
Capability Based Programming

Notional Data



Funding includes: depot maintenance, tech data, & sustaining eng

Note: any funding that pushes capability more than 2.5% above the AA std is in excess (red)

Data for illustration purposes, does not reflect actual values.

Stakeholders

OSD

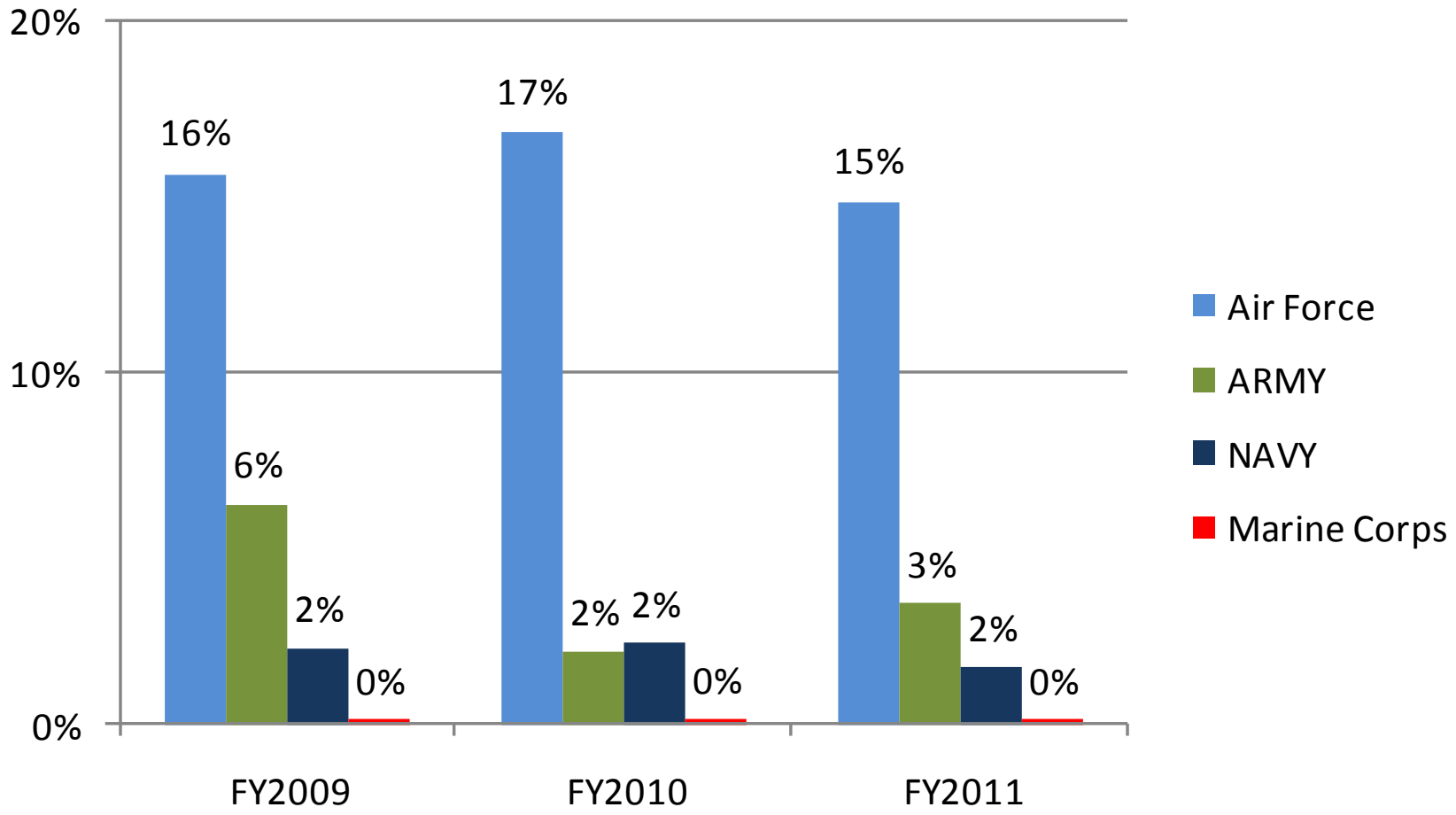
Army	Navy / Marine Corps	Air Force	OSD
HQDA/G-8/PAED G-44 & G-48	OPNAV N43, N80, N82 HQMC P&R & I&L	HAF/A47PY & A4LM	CAPE/FICAD
AMC	NAVAIR MCLC	AFMC	OUSD(AT&L)/ ASD(L&MR) ADUSD(MPP)
AMCOM, TACOM, CECOM	COMFRCs	ALCs	OUSD (C)/ Mil Operations
Army Depots	FRCs and MC Depots	Maint Wings	JS/J-4/Maint Div

Legend:

L&MR: Logistics & Material Readiness
AMC: Army Material Command
CECOM: Comm. and Electronics Command
AFMC: Air Force Material Command
FRCs: Fleet Readiness Centers
MC: Maintenance Center
MPP: Maintenance Policy & Programs
AMCOM: Aviation & Missile Command
TACOM LCMC: Tank Automotive Command
ALCs: Air Logistic Centers
MCLC: Marine Corps Logistic Command

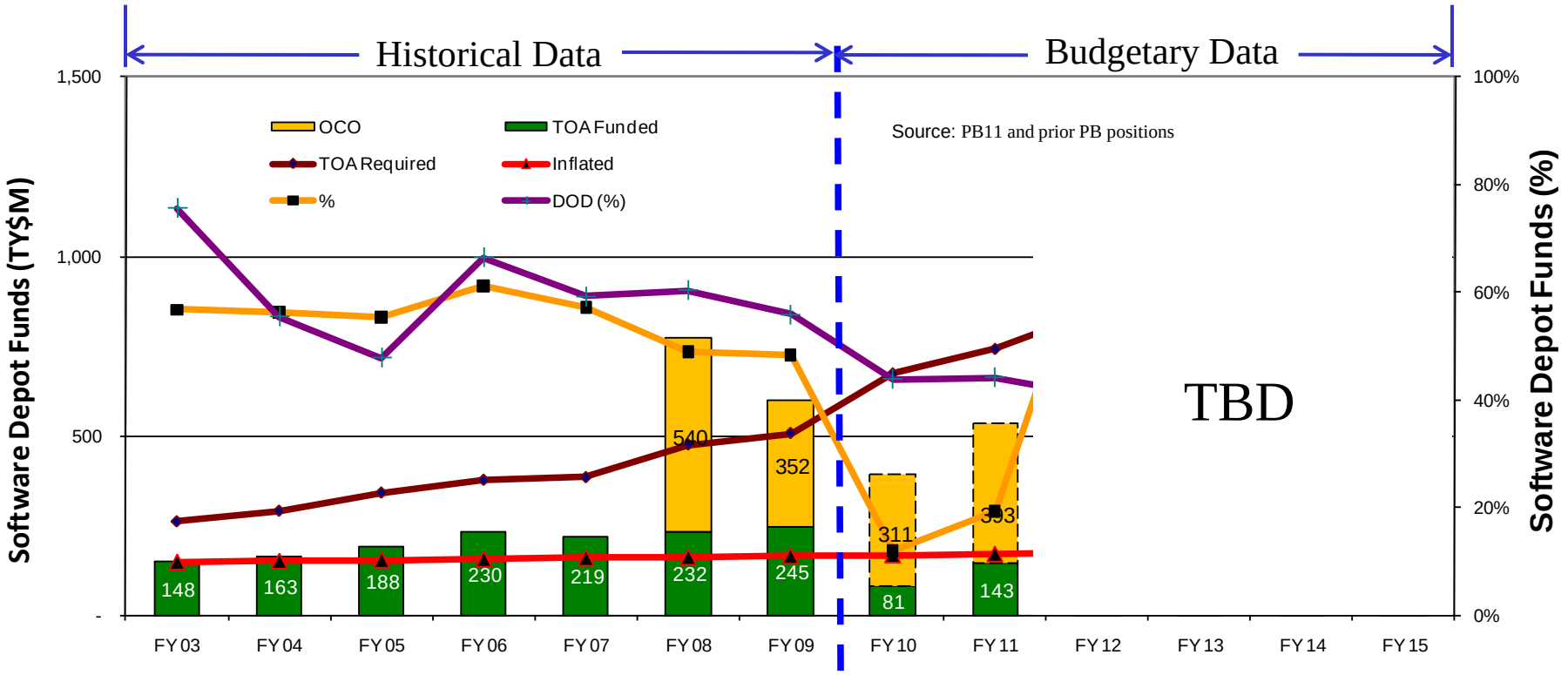
Tab B. Software Study

FY2011 Services' Allocated Software DMx



Source: PB 2011 SNaP OP-30

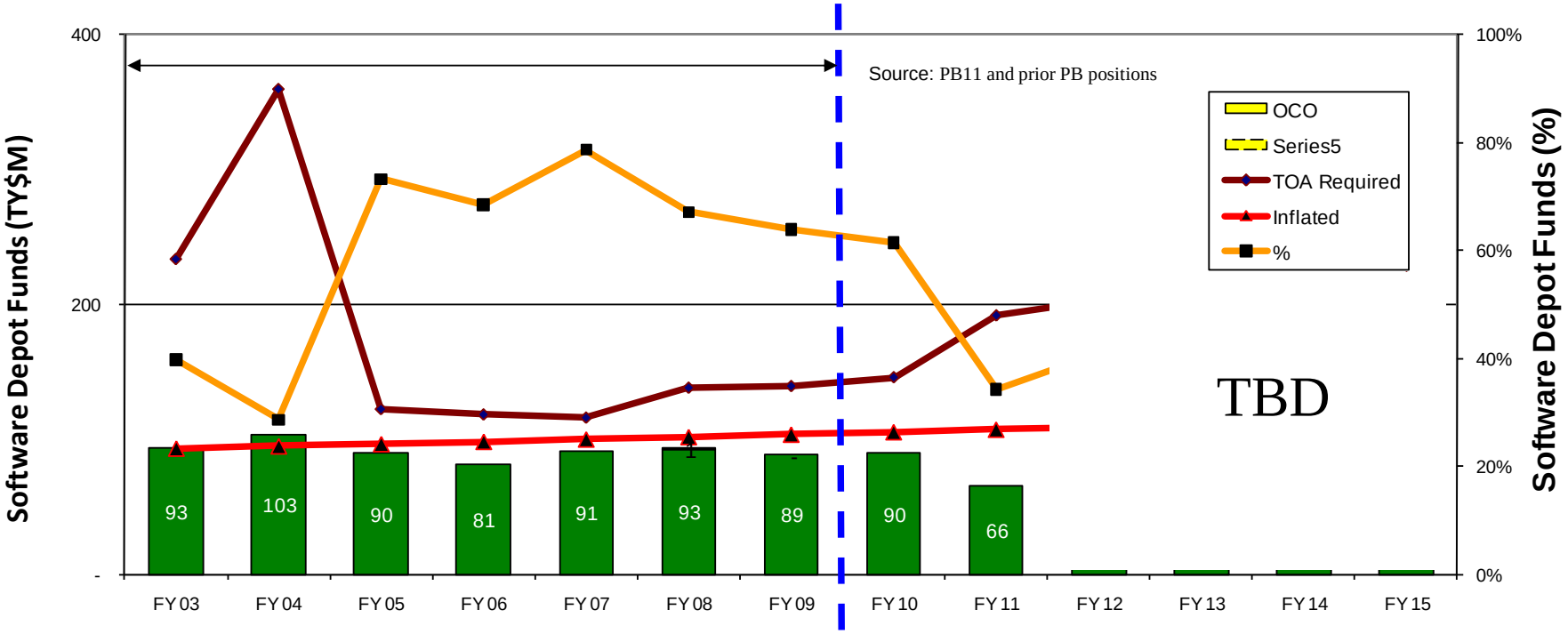
USA DMx – PPSS PB 2011



- Post Deployment Software Support (PDSS) data were *not* reported in SNaP OP-30 programming and budgetary data submission.

USN Aircraft Software DMx

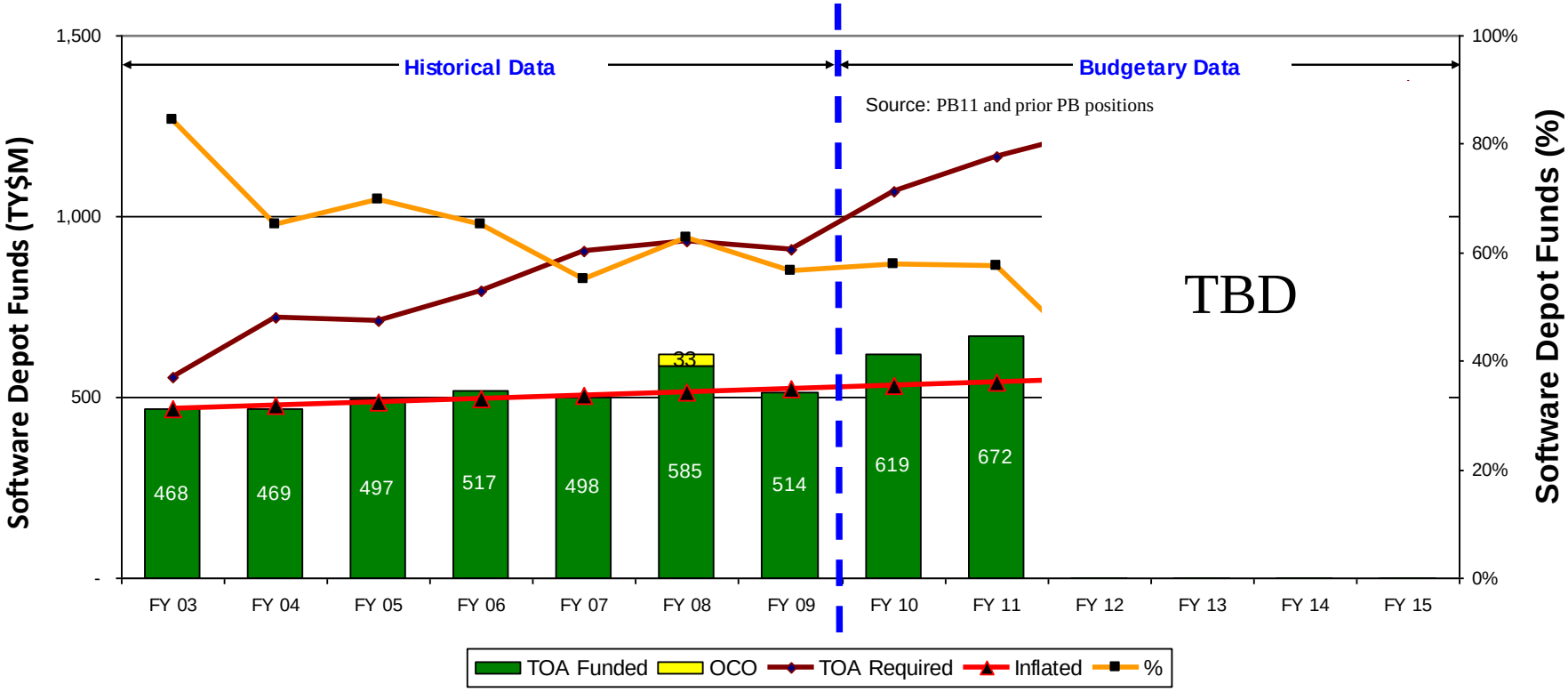
OSD



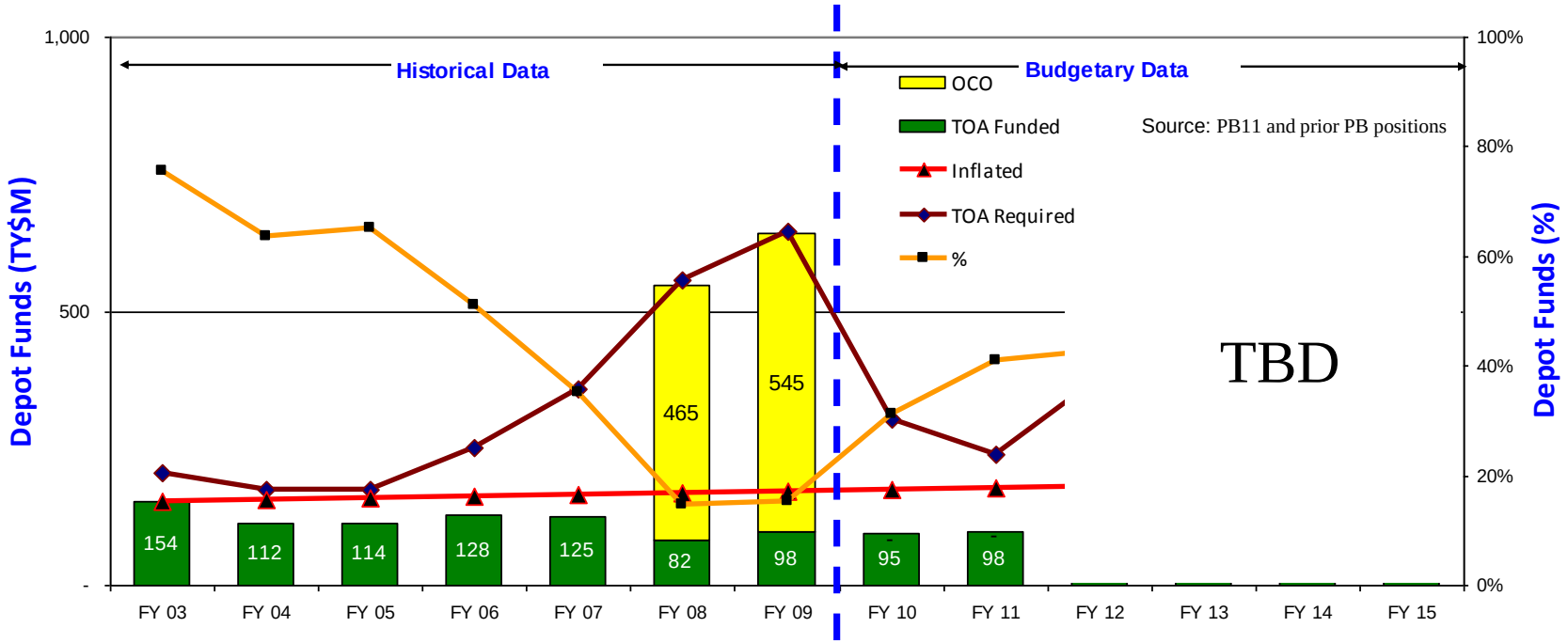
- Software data for surface and subsurface platforms were *not* reported in SNaP OP-30 programming and budgetary data submission.

USAF DPEM - Software

OSD



USMC DMx PB 2011



- Software data were *not* reported in SNaP OP-30 programming and budgetary data submission.