Analysis of Operations and Support Cost Trends
or
Why do Aging Aircraft Cost so Much

Briefing for Ageing Aircraft Forum
October 6-8, 2004

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NAVAIR Cost Department/Aging Aircraft IPT

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CONTENTS

- Issue of Aircraft Aging
- Flying Hour Program (FHP) Cost Increases
- AVDLR "Root Cause" Analysis
- New Item Impacts on AVDLR Cost
- Consumable Cost Increase Analysis
- Consumable Generational Cost Growth
- Conclusion and Observations

A/C Aging Across Almost 100 Years

Really Old Aircraft – but not Aging

Trajan Vuia Design – first full size monoplane

First Flight 1906

Common Materials and Parts

Aged Old Aircraft

A-4 Skyhawk

First Flight 1954

26+ Production Years with Many Variants

Last Year in Active Fleet 1993

Aging Middle Aged Aircraft

AV-8B Harrier

First Flight 1978

Avionics and Systems Upgrades

Currently in Active Fleet

Aging New Aircraft

F/A-18E/F

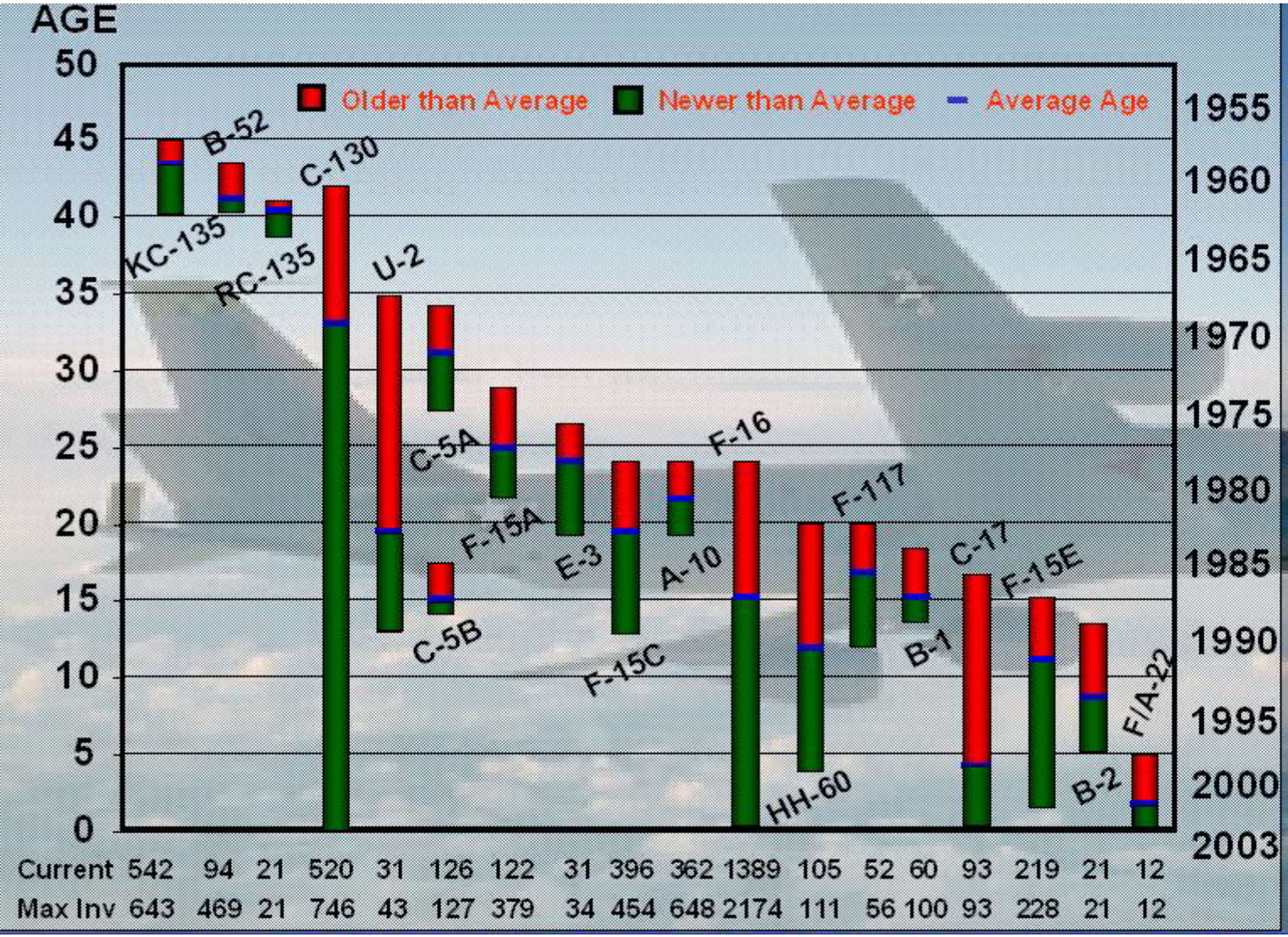
First Flight 1995

In Production with Road Map Systems Planned

Age of Operational AF Aircraft

Old to New—Current Fleet

Issue of Aircraft Aging



Sputnik '57

Laser Invented '60

Man on the Moon '69

Pocket Calculator '72

Home Computer '75

Compact Discs '81

Laptop Computer '86

Internet Browser '91

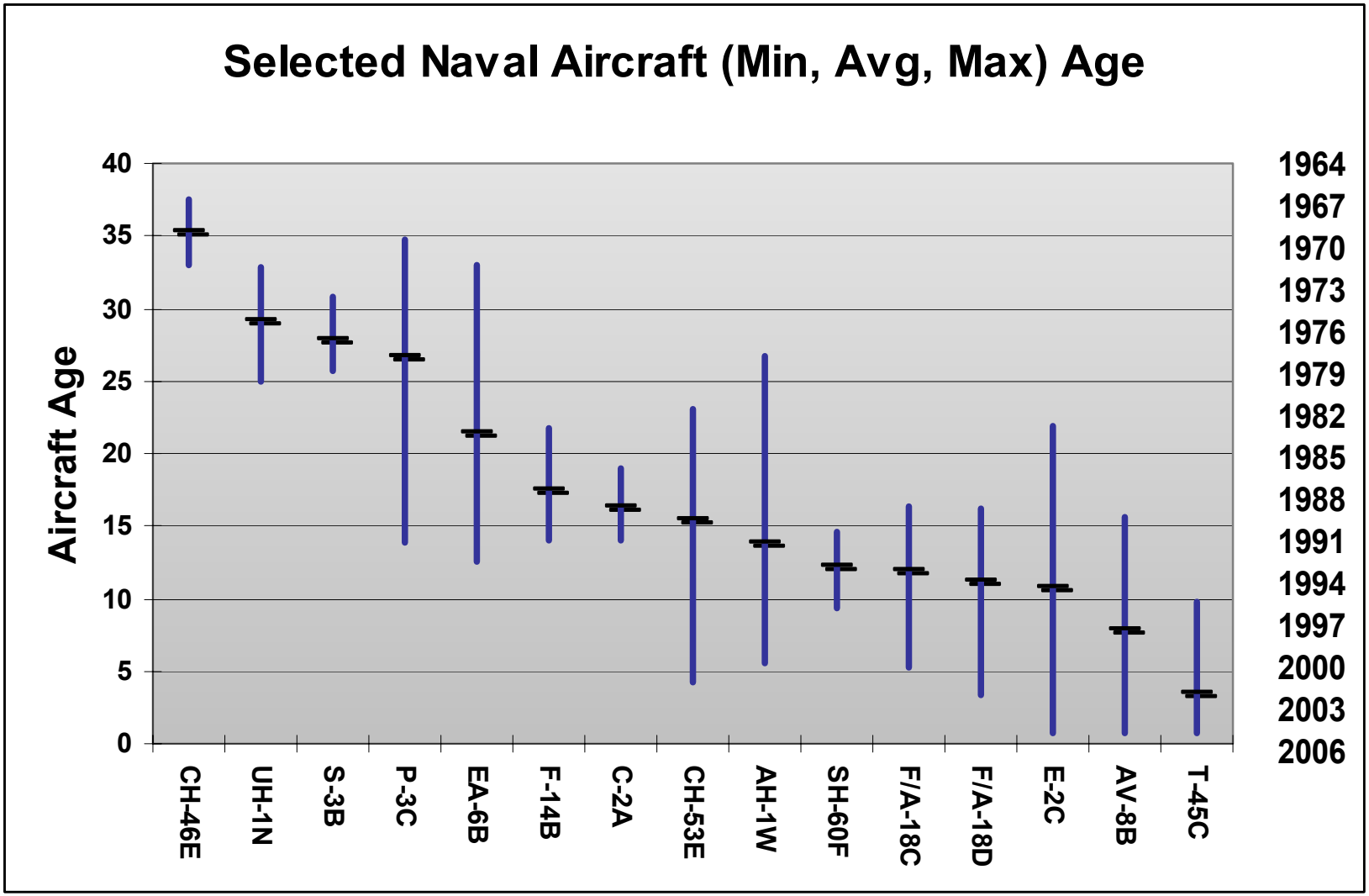
DVD Invented '95

Int'l Space Station'98

Max Inventory Since 1970

Age of Operational Naval Aircraft

Old to New—Current Fleet

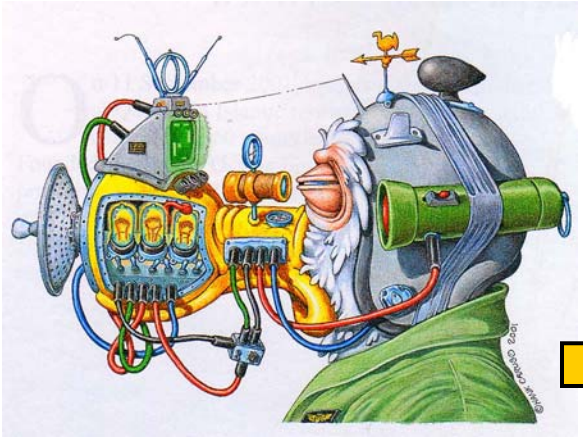


SELECTED AGE EFFECTS

DYNAMIC COMPONENT
WEAR OUT

OVERALL AGING INCLUDING
PROPULSION SYSTEMS

STRUCTURAL
DEGRADATION/CORROSION



OUTDATED ELECTRONICS

EXPIRING WIRING

Lust Aircraft Stages of Aging Dust

Phase 1 New Aircraft

Corrosion/inspection are minor issues
Limited depot work
Component AVDLR increases driven by increasing failures
Limited APN-5 funded mods
Manpower increases absorbed in overall manning structure

Phase 3 Late Mature Stage

Corrosion/inspection are major labor cost drivers
Periodic depot visits with increasingly severe emergent repairs
Increasing mods due to add'l reqmt's/svc life extension issues
Increasing number of hangar queens
Strong pressures on manning due to increased workload

AVDLR

Mods

SDLM

Corrosion/Inspection

Phase 2 Early Mature Stage

Corrosion/inspection increasing
Aircraft in full cycle -- periodic depot visits
Component AVDLR increases at higher level than Stage 1
Mods still small but increasing due to safety/requirements
Manpower implications still hidden within overall manning structure
Some aircraft becoming hangar queens due to recurring problems

Phase 4 Final Life Stage

Depots deal with major structural issues
Major SLAP/SLEP req'd to fly due to structural fatigue issues
Obsolescence becoming major cost driver -- Major mod costs
Problems fielding deployable units due to smaller population of available airframes and engines

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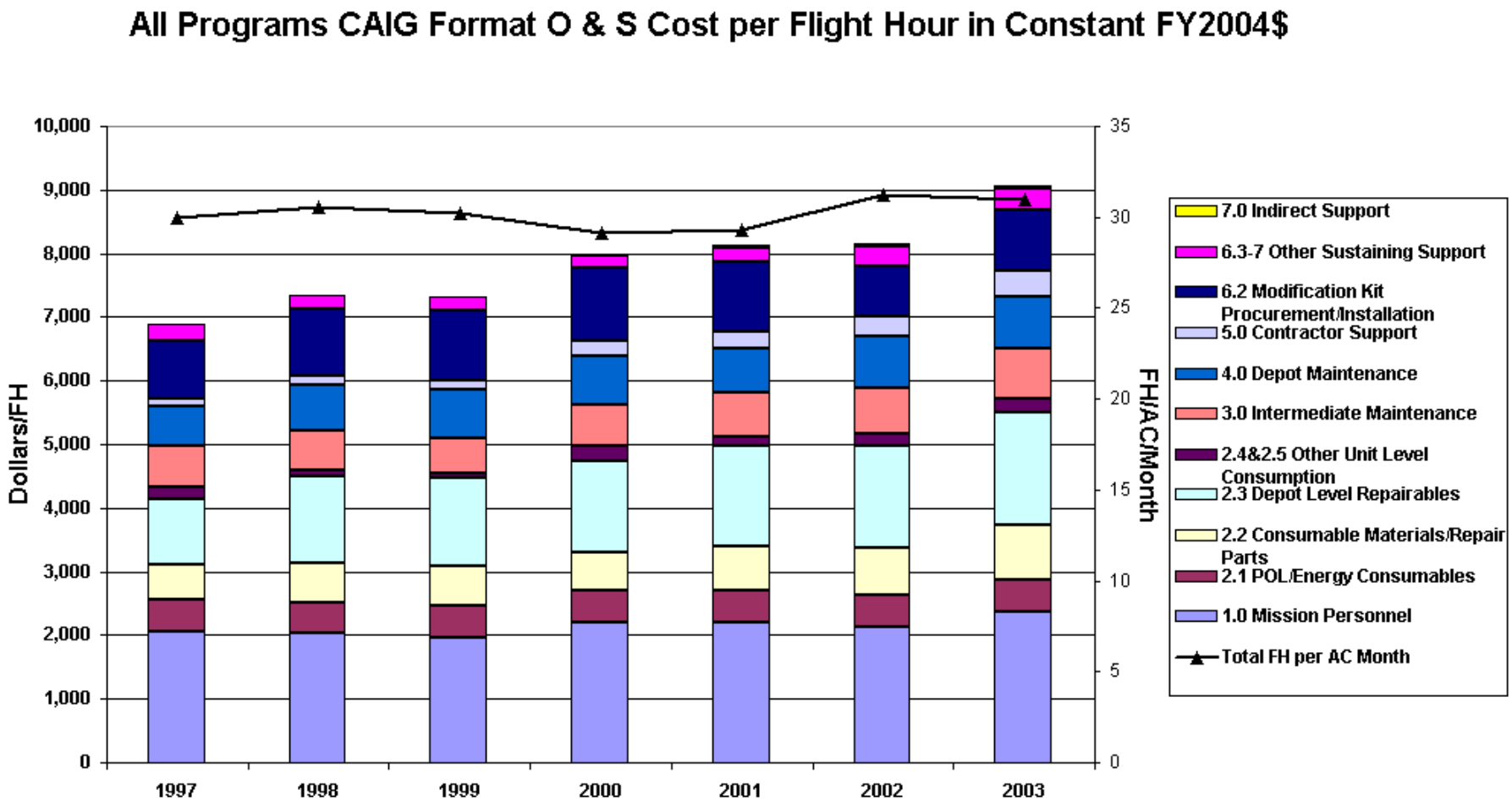
Significant Aging Issues

- Need for Increasing Mods to Meet Evolving Threat and Address Safety/RAM Issues
- Fatigue Life Restrictions
- Reduced Quantities of Aircraft – Attrition
- Inability to Meet Some Requirements
- Requirements for Additional Depot Rework
- Increased Burden on Fleet Personnel
- Impacts on Fleet Flying Hour Program

Items in Blue Show Greatest O&S Budget Impacts

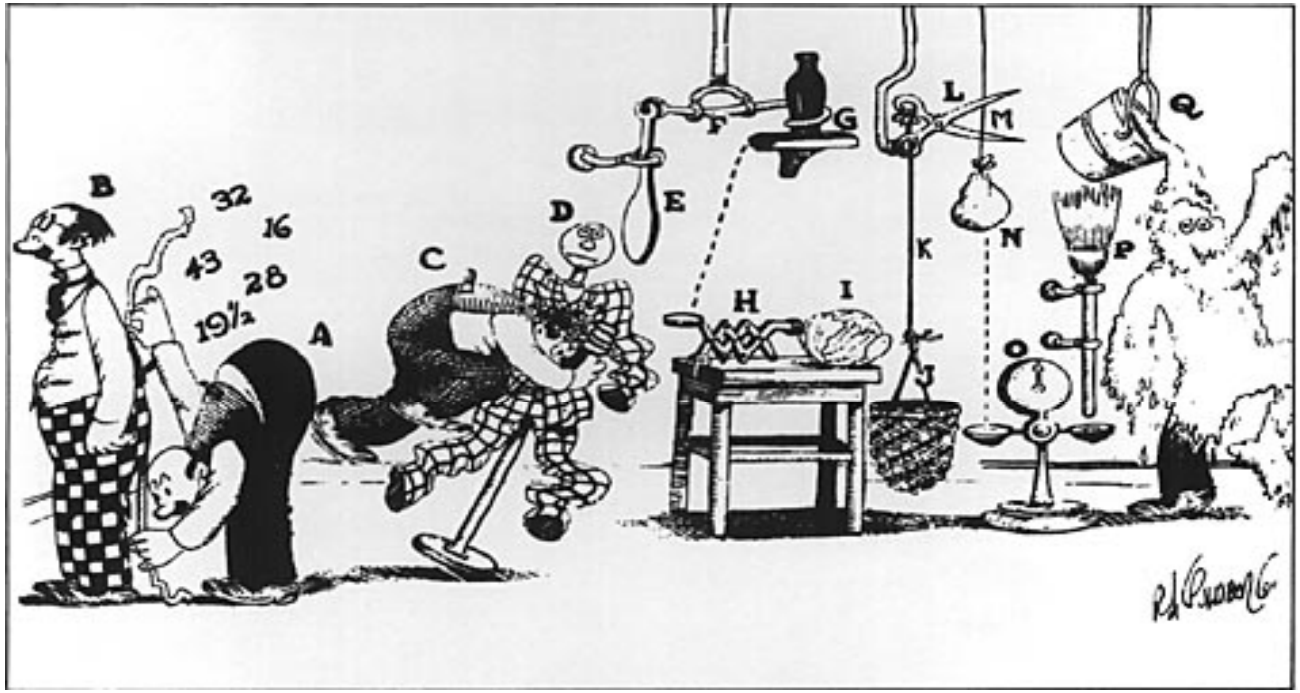
Naval Aviation O&S Costs



Data Retrieved 7 July 2004

Flying Hour Program AVDLR and Consumables Increasing 6-8% Per Year Including Contribution of Increased Documented CLS Costs

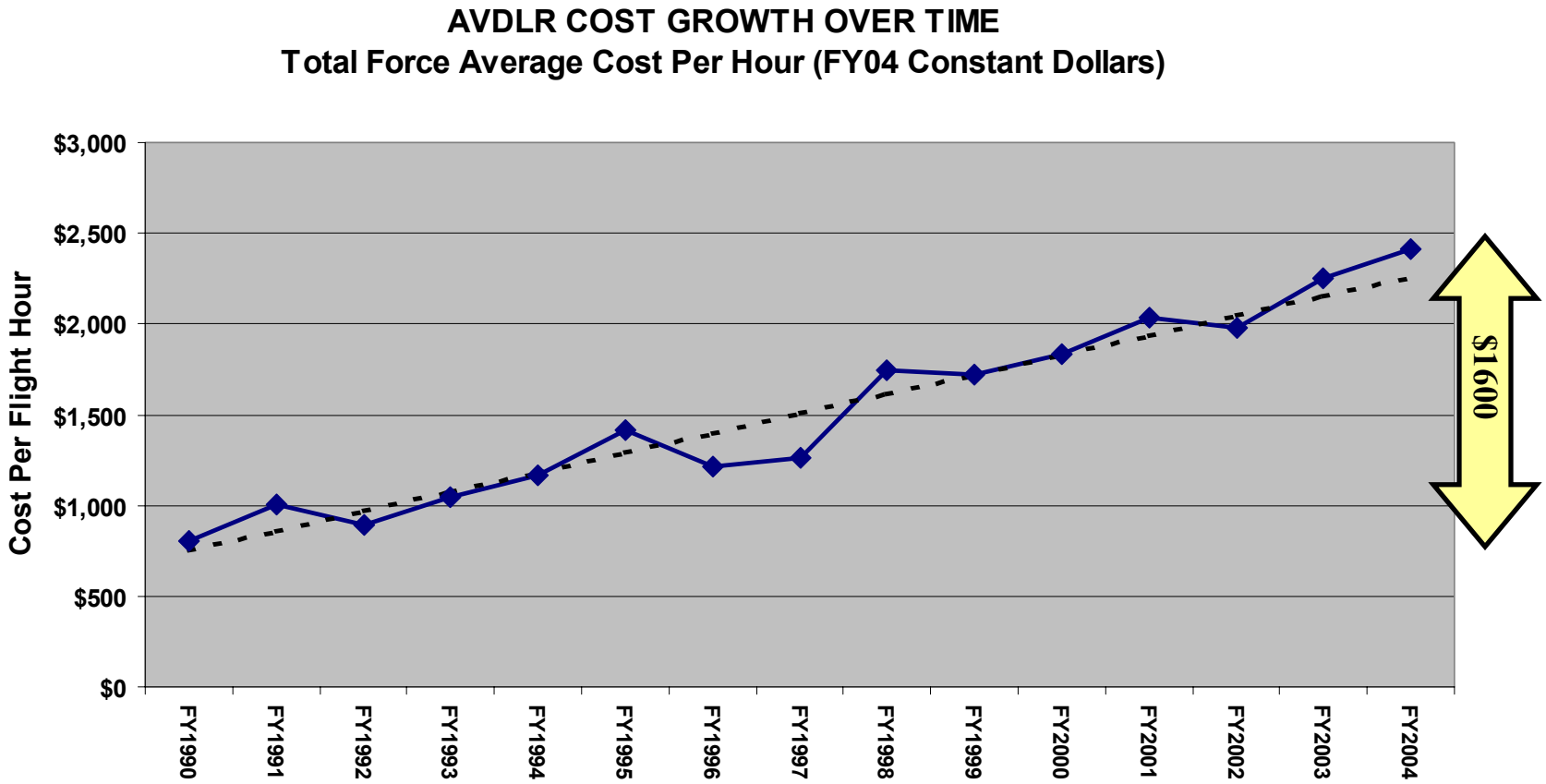
Age Linked to Cost



- Because Aircraft/Equipment Age and Cost of Operations are Trending in Same Directions It Easy to Speculate that This Represents Cause and Effect
- The Relationships are Actually More Complex Which Has Led to Much of the Debate on Aging Impacts
- Remainder of Briefing Examines Dynamics of Flying Hour Program Cost Growth and Identifies Significant Age and Non-Age Root Causes

Flying Hour Program AVDLR Cost Increase Big Picture

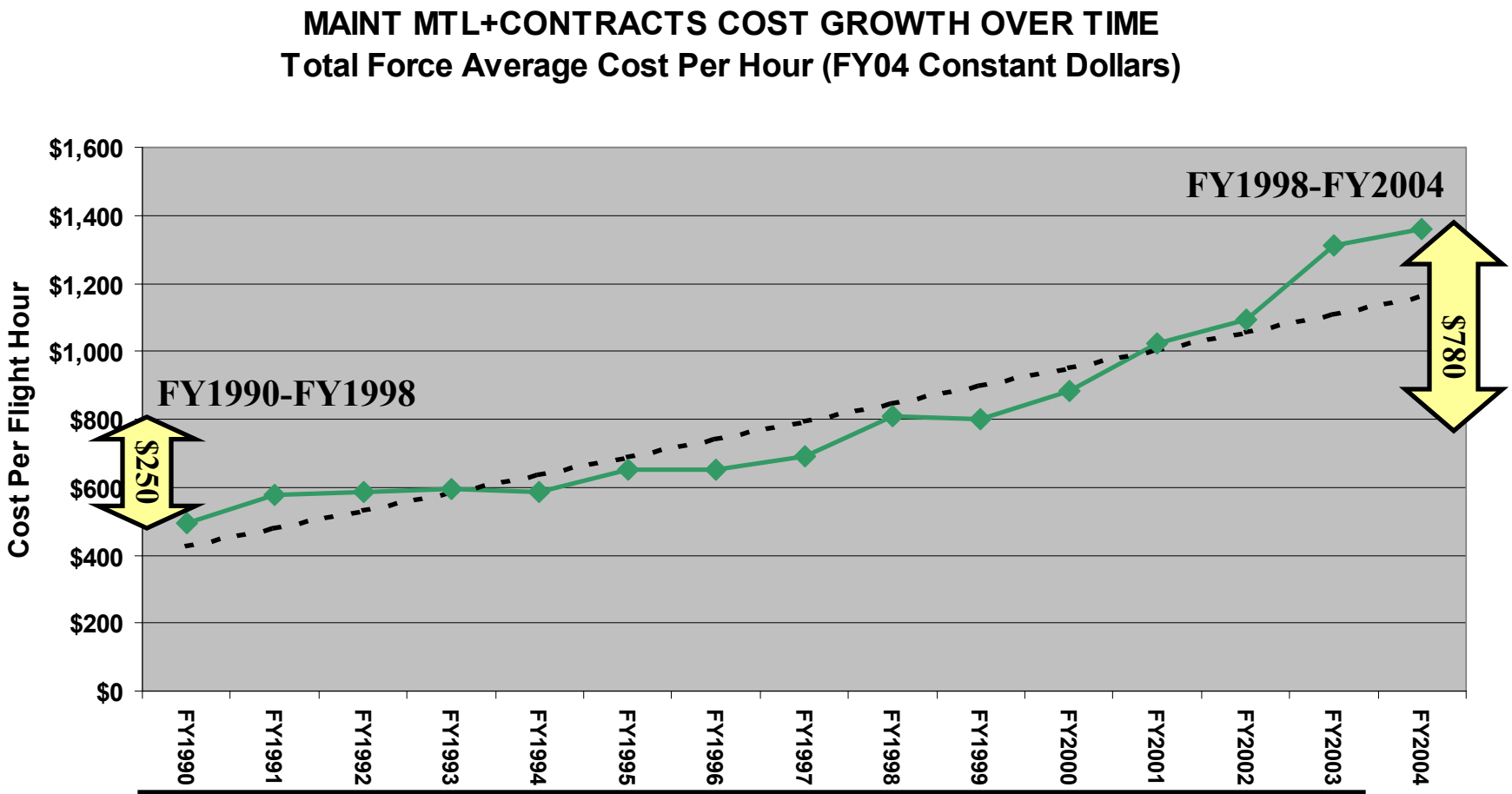
Flying Hour Program (FHP) Cost Increases



Average Annual Rate of Increase (FY90-FY2003) = $108
Pattern "Consistent from FY1990 thru FY2004
FY96 and FY97 Had "Low" Cost Recovery Rates

Flying Hour Program Material + Contracts Cost Increase Big Picture

Flying Hour Program (FHP) Cost Increases



Average Annual Rate of Increase(FY90-FY2003) = $52
Note Higher Increases FY1999 thru FY2004
Increase Approaching AVDLR Growth Rate

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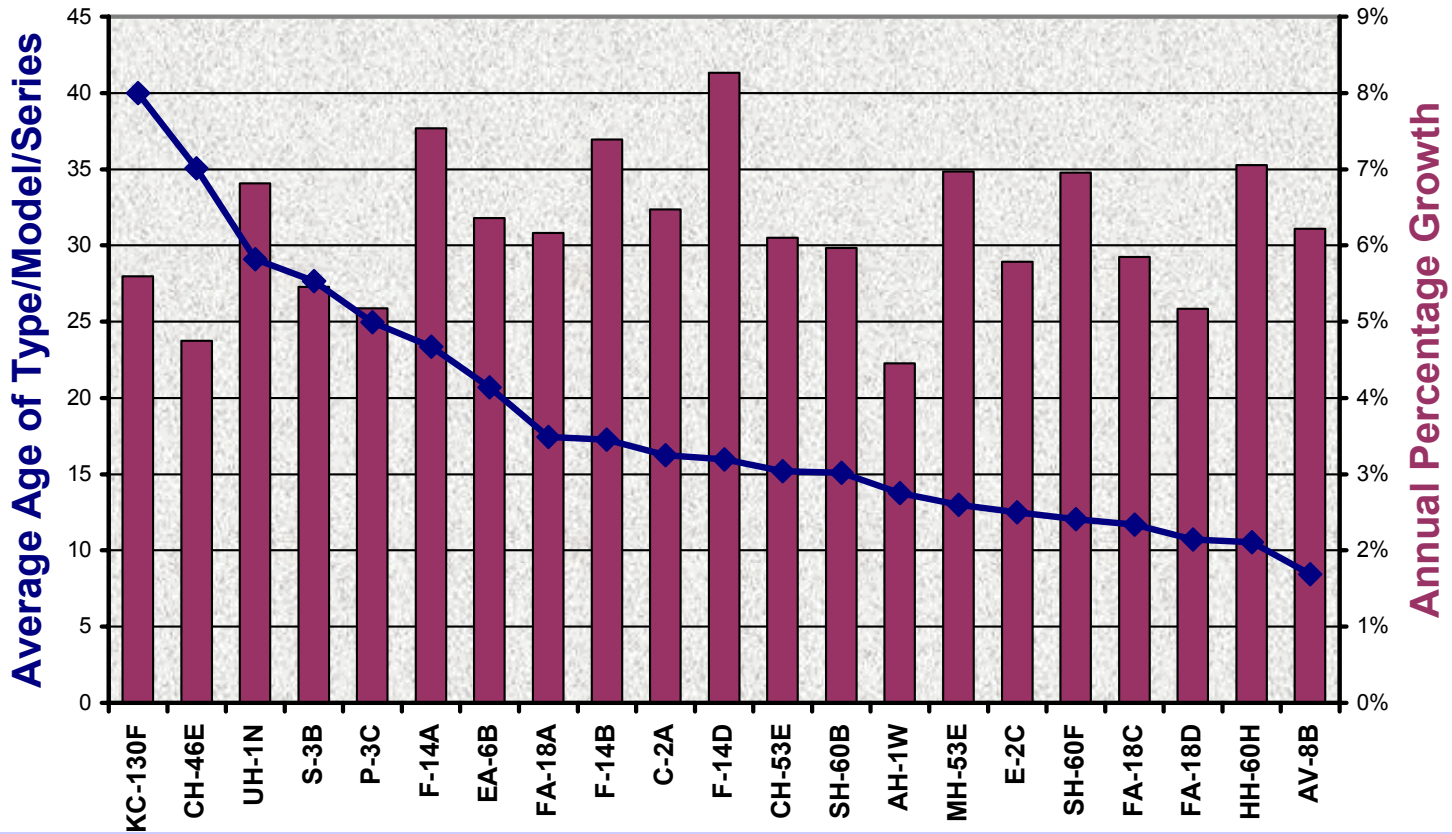
Age May Not the Only Reason for Flying Hour Program (FHP) Cost Increase

Flying Hour Program (FHP) Cost Increases

Average Age of T/M/S Fleet Compared to the Estimated Percentage Growth of AVDLR and AFM Per Year



Little Apparent Correlation with Average Age of Specific T/M/S and Percentage Increases Over Time (FY90-FY2002) From CAVTS Expenditure Data

Studies To Assess Root Causes for AVDLR Price Increases

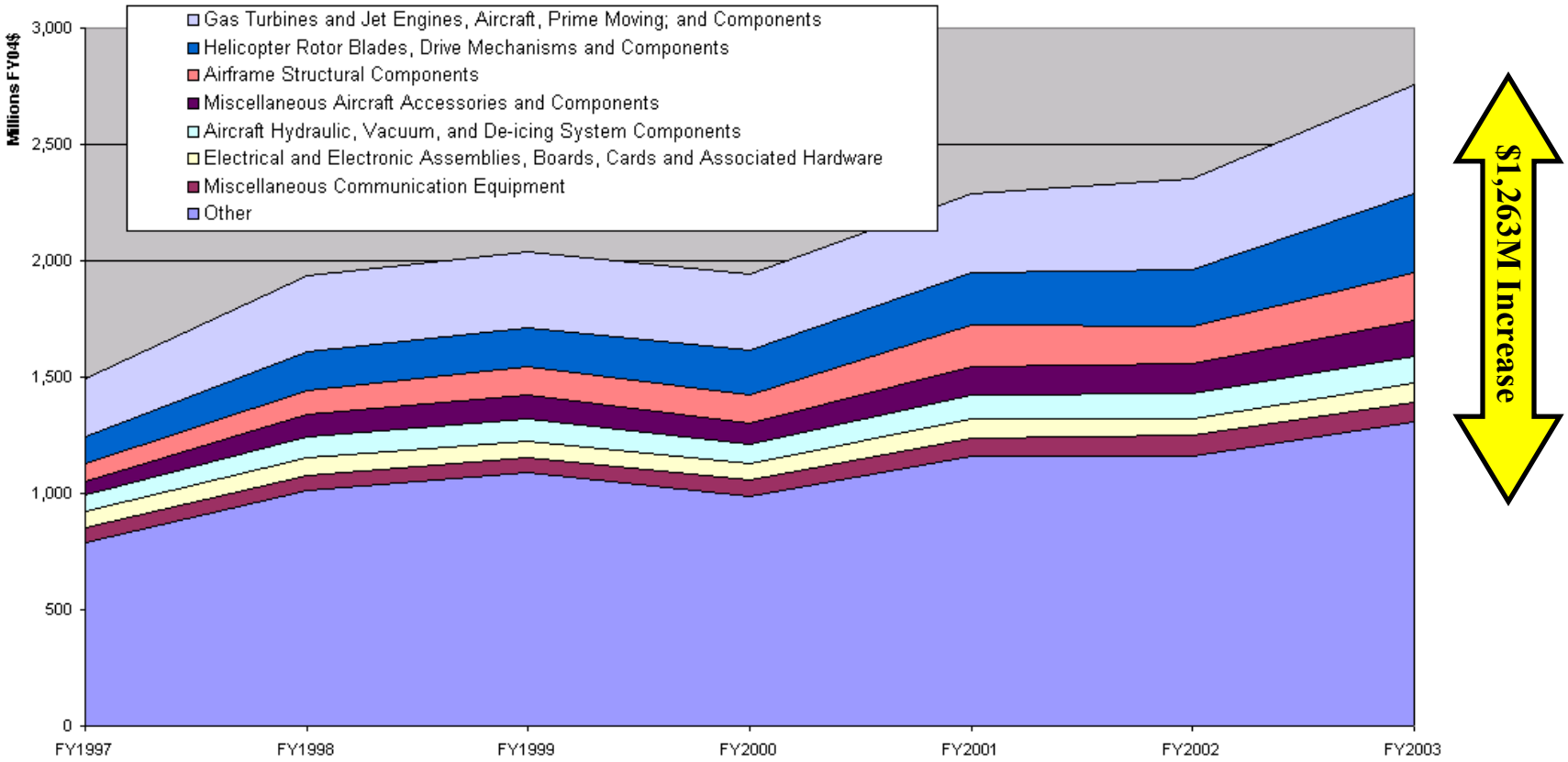
AVDLR "Root Cause" Analysis

- Initial Study on Top 25 Items for Selected Naval T/Ms and Engine TECs Completed Supporting FHP CEBs
- Study Expanded with Air Force Participation in FY2003 as Part of ALB Tasking to Assess Impacts of Aging Fleets on Budgets
- NAVAIR Received Demand and Price Data for AVDLRs from NAVICP for All Items for FY1997-FY2003
- Root Cause Analysis Results Have been Presented to Aviation Logistics Board and JACG
- Causal Factors Include Aging But Also Other Non-Age Related Factors
- NAVAIR Independently Examining Impact of New Items on Current and Future AVDLR costs

AVDLR Cost Growth

Based on NAVICP Price/Demand History –FY04$

AVDLR "Root Cause" Analysis



Breakout of Top AVDLR FSC Classifications for Total Demand in TY$
Total Cost Increased 92% in Period FY1997 though FY2003
Top 7 FSCs Accounted for 53% of Total AVDLR in FY2003
Rate of Growth Reasonably Consistent by FSC

Common Analysis Approach

Used in Joint Study with Air Force

AVDLR "Root Cause" Analysis

Study Process

Root Causes

Aging	Maint
Obs	Log
Parts	Design
Vender	Other

DLR Drivers

Top-25 DLR cost drivers by Weapon System

Assign root cause and allocation

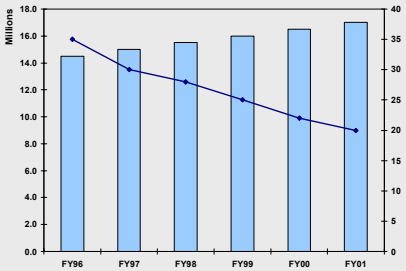
DLR Root Cause

Part	% Increase	Why
LRU-1	100%	Description of root cause for LRU-1
LRU-2	80%	Description of root cause for LRU-2
LRU-3	300%	Description of root cause for LRU-3
LRU-4	125%	Description of root cause for LRU-4

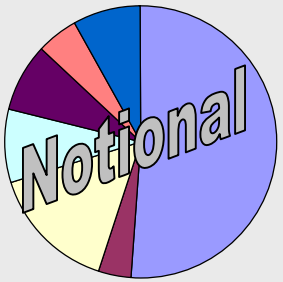
DLR Allocation

Component	Factor	Age	Obs	Vnd	Log	LEC	PM	PC	Other	Action
LRU-1	Vnd			1						
LRU-2	Age, Obs	05	05							
LRU-3	Maint, Pm						1			
LRU-4										
LRU-5										
LRU-6										
LRU-7										
LRU-8										
LRU-9										

Demand and Cost Trends



Root Cause Analysis



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ROOT CAUSE DEFINITIONS

DLR Analysis Approach

Consensus on Root Causes for DLR cost growth

1. **Aging System** (Physical aging of equipment)
   - Reaching life limits
   - Increased corrosion
   - Replacement factor for repair parts
   - "Beyond economic repair" items
2. **Obsolescence/Vendor Base/DMS** (Causes due to aging of component as type)
   - Reduced sources/competition
   - Rework vice replacement of items
   - Premium prices and Cannibalization
3. **New/Replacement parts** (Costs attributed to introduction of new parts)
   - Attrition changes with higher cost materials
4. **Vendor Base Changes** (costs associated with supplier change)
   - Changes in vendor sources
5. **Maintenance Plan Changes** (causes due to maintenance changes)
   - 3-level to 2-level maintenance
   - Discard vice repair
   - Increased depth of maintenance
   - Reduction in life limits/increased frequency
6. **Logistics Shortfalls** (costs due to lack of logistics plan)
   - Support equipment/test equipment
   - Repair parts
   - Manpower
   - Pub updates
7. **Design Influences** (costs due to design changes)
   - Capability growth
   - Design "mistakes"
   - Inherent design limitations on R&M
8. **Other** (not repair process related)

   Budgetary complications, usage issues, mission changes, threat changes, surcharges & taxes, data problems, etc.

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Component Classification

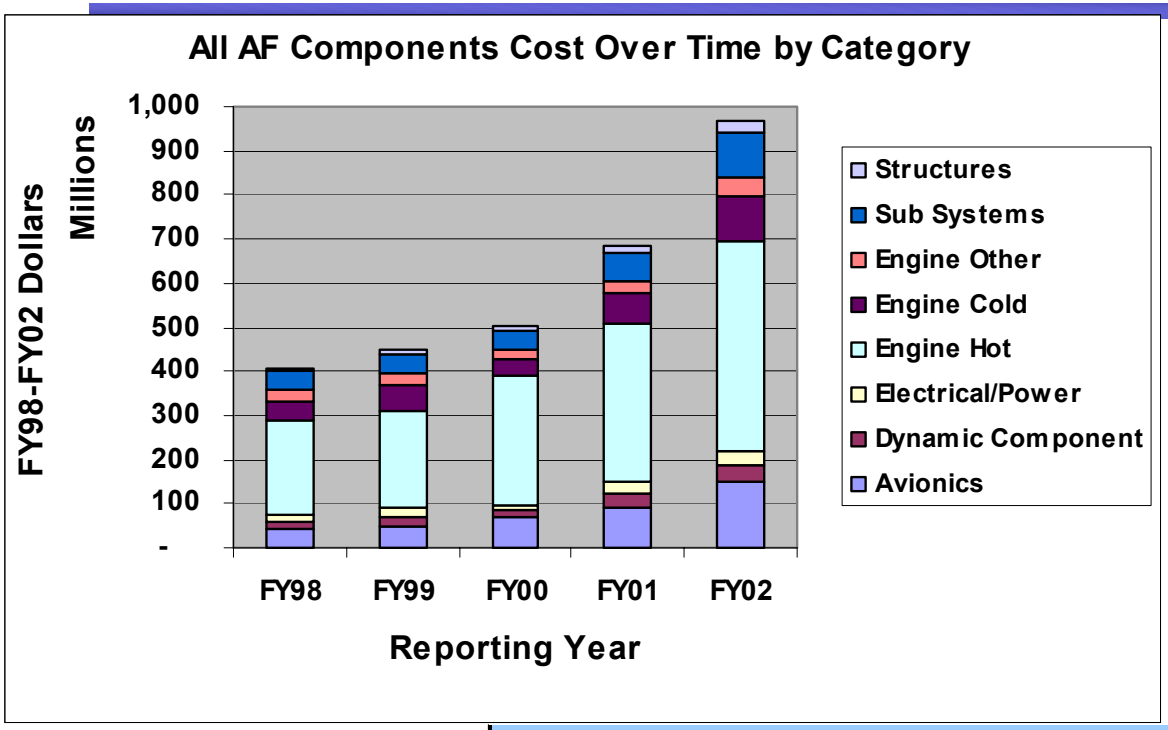
All Navy and Air Force Components Studied Categorized into Following Areas

Avionics	---->	Radars, Radios, etc
Dynamic Components	---->	Propellers, Gear Boxes, etc
Electrical/Power	---->	Generators, Starter Engines, etc
Structures	---->	Supports, Doors, Stabs, etc
Subsystems	---->	Landing Gear, Hydraulics, etc
Engine Hot Section	---->	Turbine Section
Engine Cold Section	---->	Compressor Section
Engine Other	---->	Other Engine Components

Air Force Trend Summary

131 Components Analyzed

Additional DLR Analysis

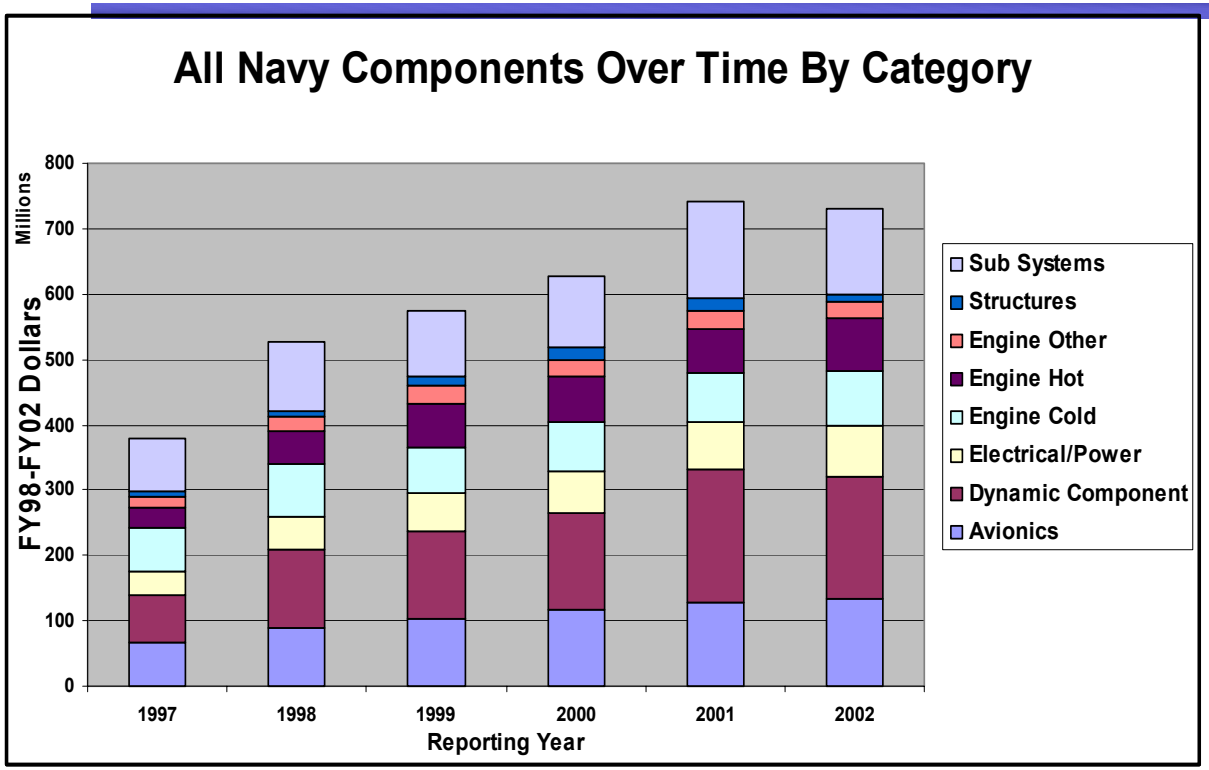


- Primary Area for Air Force Cost Growth is Engine Component Related
- No Helos or Prop Aircraft in AF DB Minimizes Dynamic Component Area
- Age, New Items and Maintenance Plan Changes All Have Significant AF Impacts
- Vendor Issues Do not Appear to be Significant Root Cause For AF

Root Cause Analysis	Age	Obs	Vndr	Dsgn	Log	New Item	Maint Plan
Avionics	20.5%	17.7%	5.1%	6.3%	7.5%	22.0%	20.9%
Dynamic Component	10.0%	38.0%	0.0%	14.0%	32.0%	0.0%	6.0%
Electrical/Power	0.0%	0.0%	0.0%	0.0%	10.8%	72.0%	17.2%
Engine Cold	32.2%	0.0%	0.0%	13.4%	3.4%	8.7%	42.3%
Engine Hot	48.9%	2.8%	0.0%	12.8%	0.3%	14.5%	20.6%
Engine Other	25.0%	0.0%	0.0%	27.5%	0.0%	47.5%	0.0%
Structures	66.2%	0.0%	0.0%	0.0%	22.1%	0.0%	11.8%
Sub Systems	26.5%	15.9%	5.9%	7.1%	14.7%	24.1%	5.9%

Navy Trend Summary
313 Components Analyzed

Additional DLR Analysis



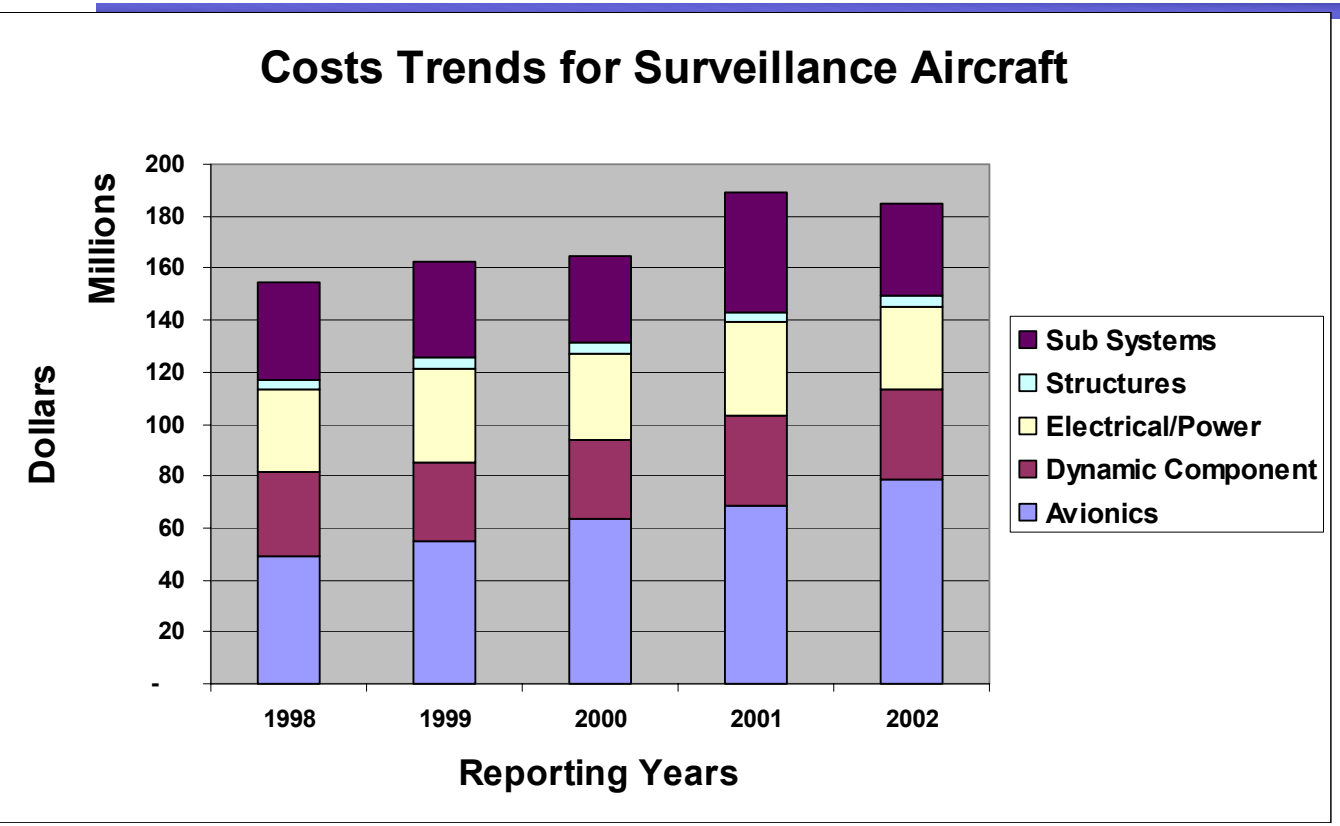
- Primary Area for Navy Cost Growth is Dynamic Component and Sub System
- Only Four Engines Studied Reduces Engine Impacts
- Age Appears As Primary Contributor to ALL DLR Categories
- Obsolescence a Key Factor for Avionics Cost Growth
- Maintenance Plan Changes and Vendor Not Primary Causes

Root Cause Analysis	Age	Obs	Vndr	Dsgn	Log	New Item	Maint Plan
Avionics	27.5%	45.0%	1.3%	8.1%	8.1%	9.4%	0.6%
Dynamic Component	61.0%	0.0%	7.3%	3.7%	11.0%	12.2%	4.9%
Electrical/Power	40.6%	4.7%	6.3%	37.5%	3.1%	3.1%	4.7%
Engine Cold	64.2%	0.0%	0.0%	0.0%	7.7%	28.2%	0.0%
Engine Hot	86.2%	0.0%	0.0%	0.0%	0.0%	10.3%	3.4%
Engine Other	46.7%	8.3%	0.0%	23.3%	20.0%	1.7%	0.0%
Structures	76.7%	3.3%	0.0%	13.3%	0.0%	3.3%	3.3%
Sub Systems	52.9%	5.9%	4.4%	10.3%	14.7%	10.3%	1.5%

Surveillance Aircraft

Navy P-3, E-2C/C2, S-3

Additional DLR Analysis



- Most Significant Area of Growth is in Avionics Associated with Mission Systems
- Despite Advanced Age of Navy Surveillance Aircraft DLR Cost Growth of Other Top Components Limited
- Structural DLR Components Insignificant
- Age, Obsolescence and Design Issues Are Primary Root Causes for Surveillance Aircraft

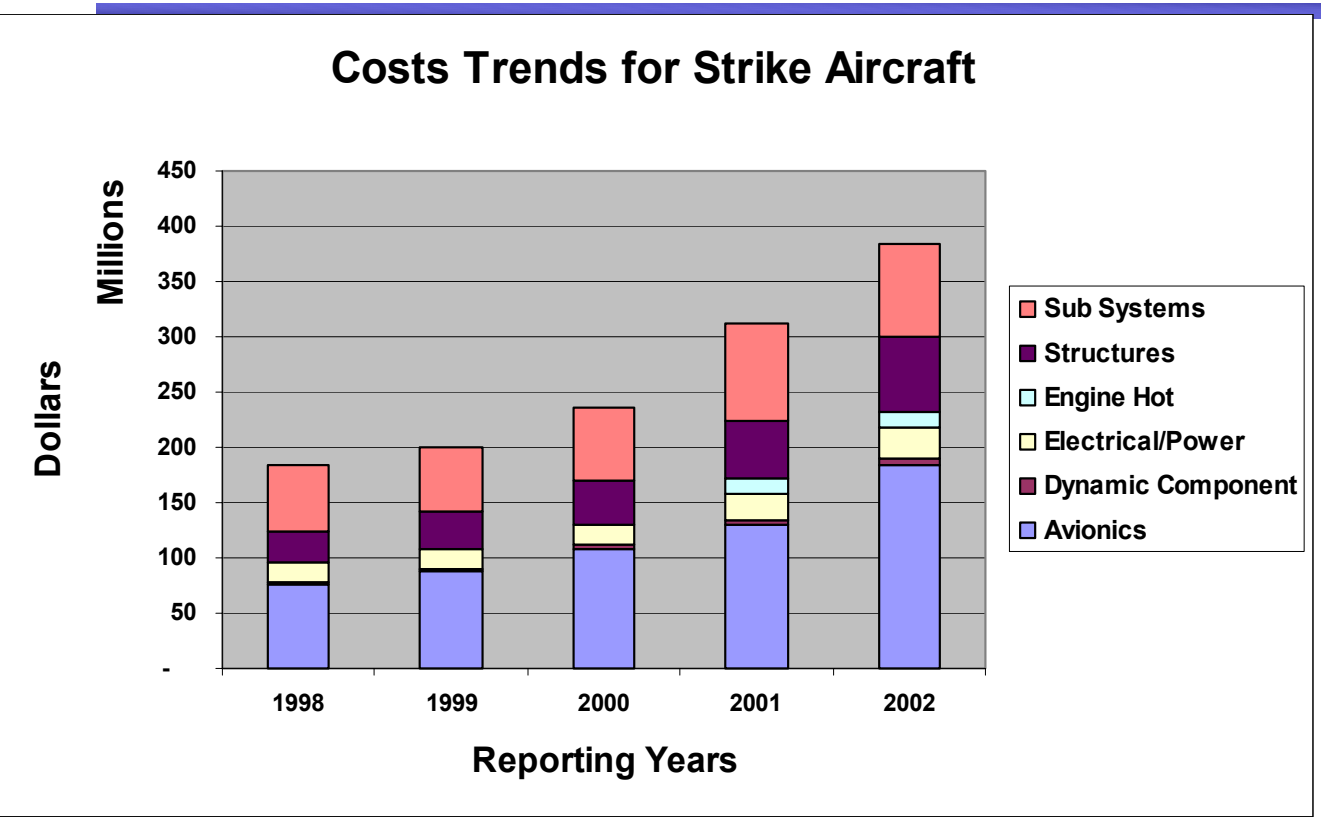
Root Cause Analysis:

	Age	Obs	Vendor	Design	Logistics	New Item	Maint Plan
Navy Only	32.2%	23.0%	1.1%	23.6%	9.8%	8.6%	1.7%

Strike Aircraft

Navy F/A-18, F-14, EA-6B, AV-8, Air Force F-15, F-16, B-52

Additional DLR Analysis



- Strike Aircraft Exhibit Significant DLR Increases in All Major Component Areas – One of Two Types With Significant Structural DLRs
- Air Force Has Significant Number of New Items -- Reflect Ongoing Modernization
- One Engine Component in F-15 Data Data Responsible for Identified Hot Section
- Navy Age and Obsolescence Root Causes Dominate Strike Community

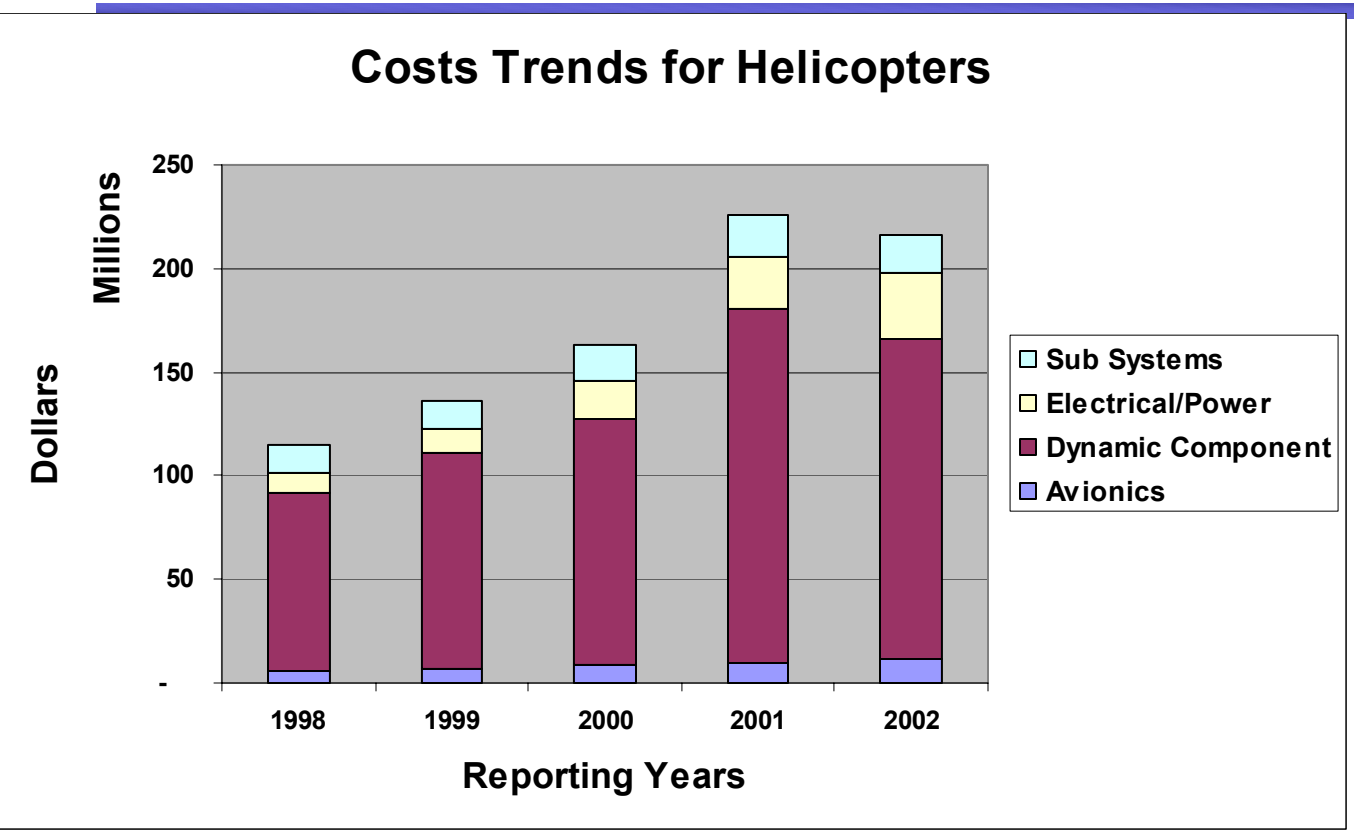
Root Cause Analysis:

	Age	Obs	Vendor	Design	Logistics	New Item	Maint Plan
Air Force	22.0%	9.9%	2.2%	4.8%	17.4%	30.2%	13.4%
Navy	53.9%	21.4%	3.9%	5.2%	10.4%	4.5%	0.6%

Helicopters

Navy H-1, H-46, H-53

Additional DLR Analysis



- Dynamic Component Area Is THE Cost Driver for Navy Helicopter DLR Cost Growth
- Age is Primary Root Cause for Dynamic Component (and Helo) Cost Growth
- Electrical/Power Subsystems also Exhibit Significant Rates of Increase
- Navy Helicopters Studied Have Relatively Limited Avionics Which Is Reflected in Repair Cost Data

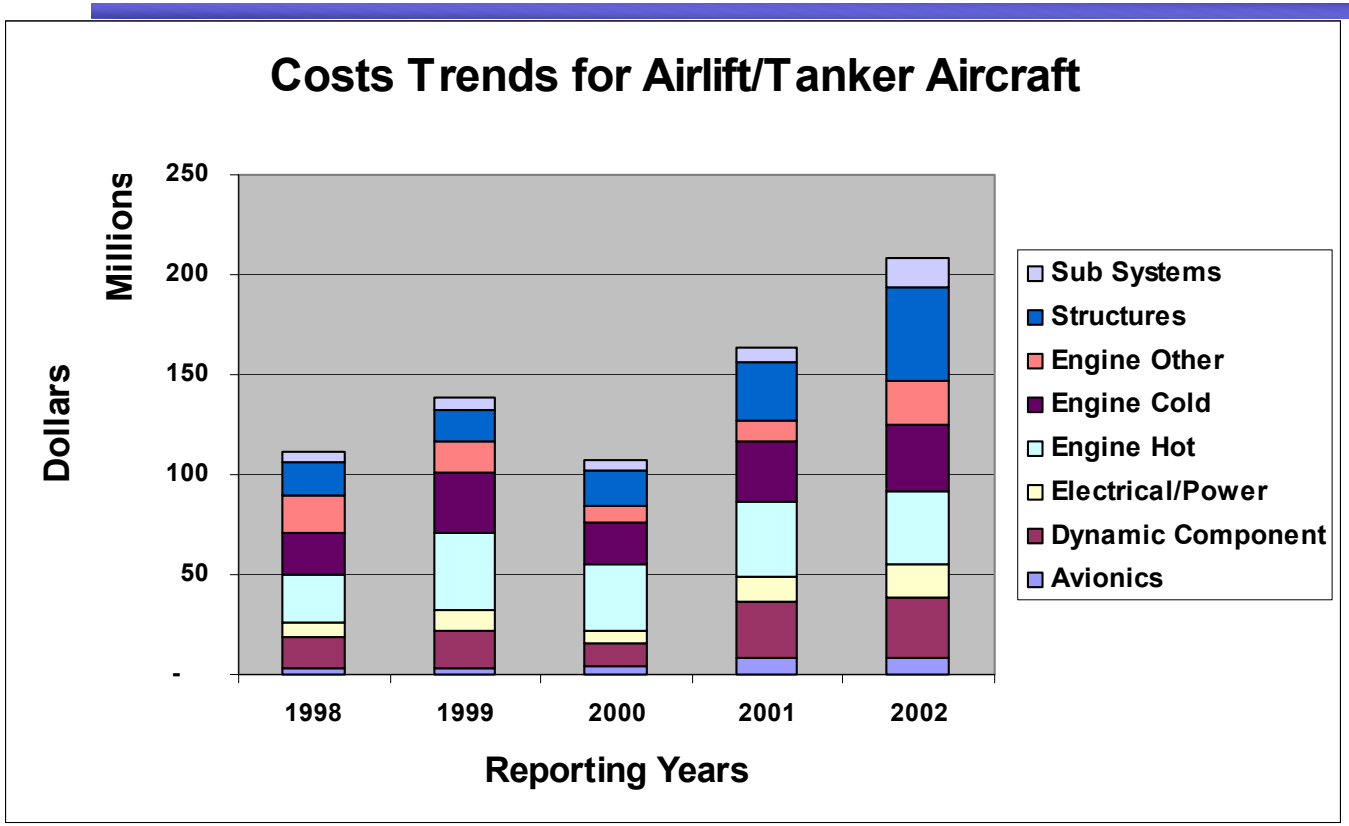
Root Cause Analysis:

	Age	Obs	Vendor	Design	Logistics	New Item	Maint Plan
Navy Only	52.1%	7.7%	7.0%	6.3%	7.7%	14.1%	4.9%

Airlift/Tanker Aircraft

Air Force C-5, C-130

Additional DLR Analysis



- Root Causes for Cost Increases Closely Grouped Between Design, Age, Obsolescence and Changed Maintenance Plan Issues
- Air Force Data Had Significant Number of Engine Components in Top 25 DLRs for C-5 and C-130
- Structure, Dynamic and Engine Components Responsible for Most of Airlift/Tanker Cost Changes

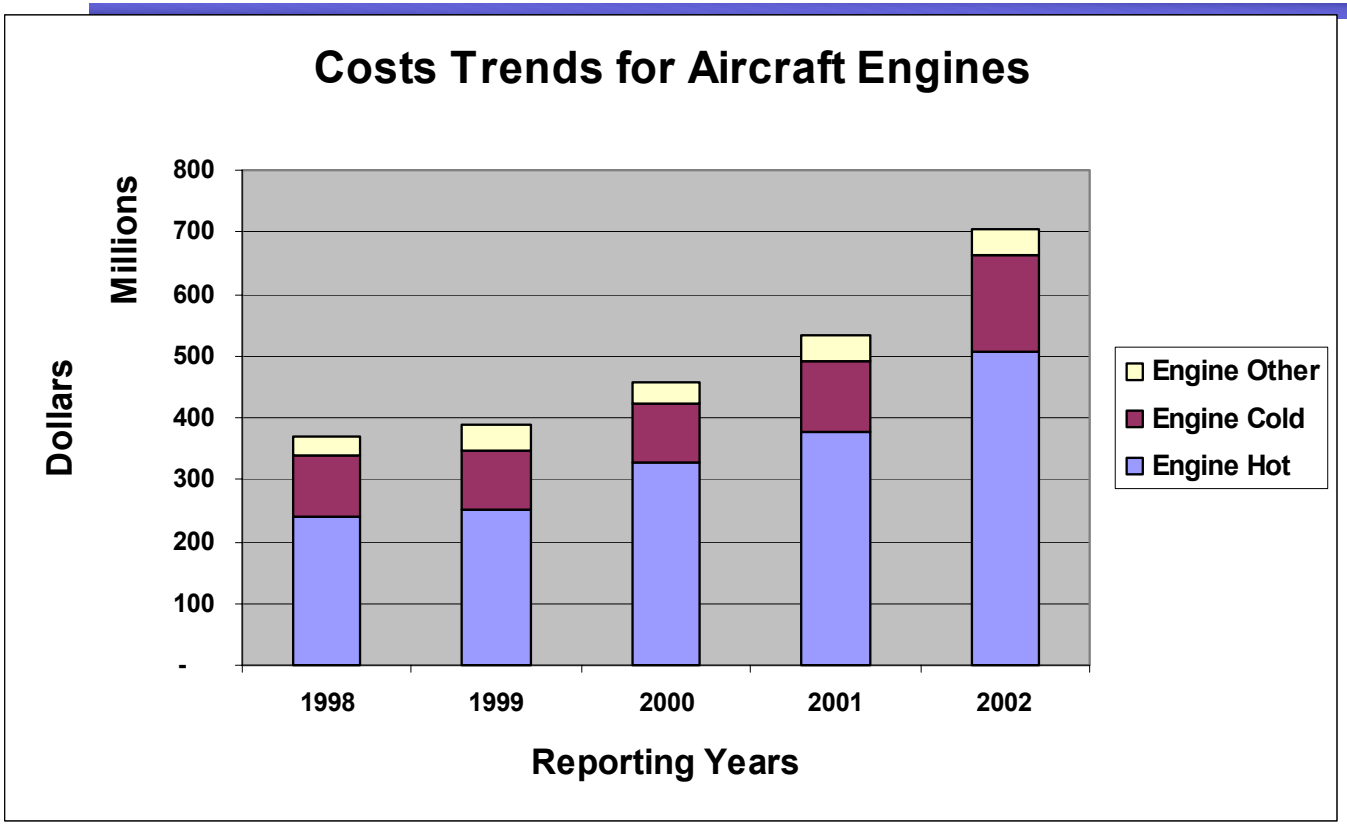
Root Cause Analysis:

	Age	Obs	Vendor	Design	Logistics	New Item	Maint Plan
Air Force Only	21.6%	17.6%	4.3%	25.2%	4.0%	11.0%	16.3%

Aircraft Engines

Navy T700,T56, F402, F404 Air Force F100, F110

Additional DLR Analysis



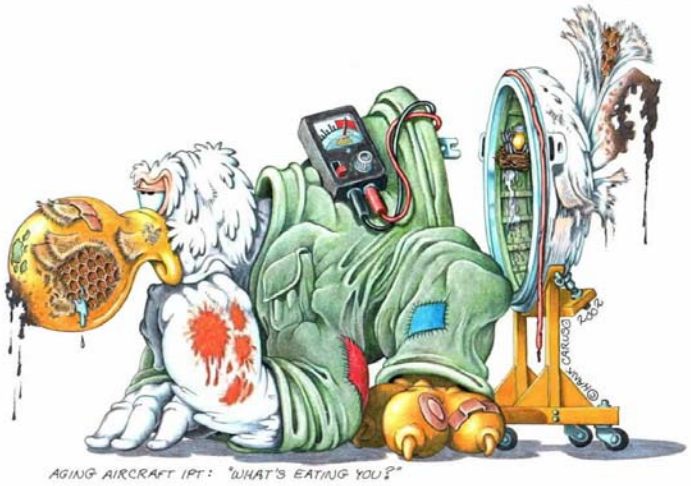
- Age is Primary Cost Growth Driver for Both Air Force and Navy Engines
- Engine Hot Section Components Contribute Most of Total Cost
- Difference in Maintenance Practices and More Recent Investments Lead to Increased Significance for New Items and Maintenance Plan Changes for Air Force
- Given Stability of Engine Firms Vendor Issues Minimal

Root Cause Analysis:

	Age	Obs	Vendor	Design	Logistics	New Item	Maint Plan
Air Force	50.5%	0.5%	0.0%	2.5%	0.0%	18.6%	27.9%
Navy	66.2%	3.4%	0.0%	9.6%	9.6%	9.8%	1.4%

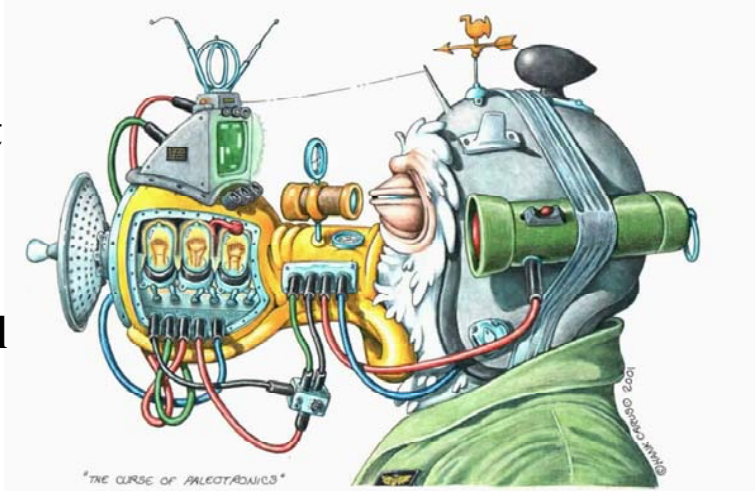
Observations From AVDLR Data Analysis

AVDLR "Root Cause" Analysis



- Simplistic Explanations that Aging Drives Flying Hour Program DLR Cost Increases Ignore Very Real Differences between Services and Types of Aircraft
- Success Oriented Approaches to Reduce Cost MUST Consider Both Types of Components and Root Causes by Platform Type
- Both Air Force and Navy Datasets Identify Engine Components as the Area Most Directly Tied to Age

- Given Ongoing Modifications to Meet Threats for "Combat" Aircraft New Items Will Be A Major Cost Increase Area Regardless of Airframe Age
- Although Not Noted in Presented Data Top 25 Components Represent a Significant Portion of Total DLR Costs for Studied Platforms
- ALB Data Analysis Set Provides Many Additional Insights that Briefing Format Precludes Addressing



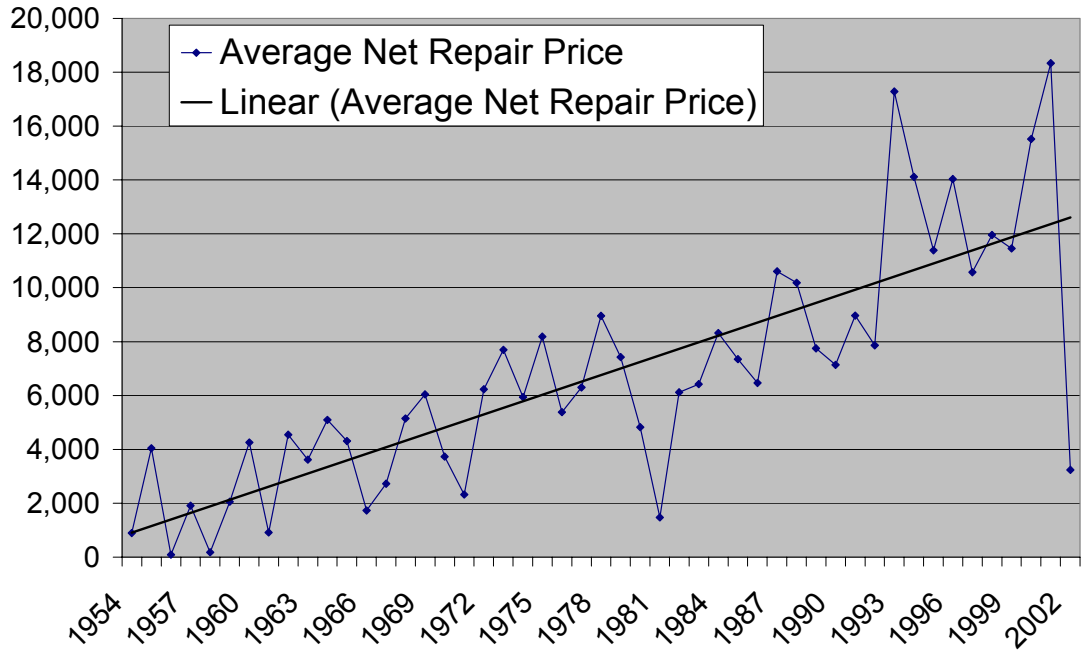
Study To Assess Impact Of New AVDLR Items Entering the Inventory

- NAVSUP Provided Databases With Demand, Price, and Date of Entry Into Supply System for About 25,000 Different DLR Items
- Data Extracted and Analyzed by Date of Entry to Observe Trends Based on Both Demand (Function of Reliability and Usage) and Unit Repair Price (Function of Complexity, Vendors, Obsolescence)
- Result Charts Represent Summary of Much More Detailed Analysis

Average Net Repair Cost by NIIN Entry Year

This is a Weighted Average Using FY2002 Net Repair Cost and Demand

New Item Impacts on AVLDR Cost



NIIN Entry Year

Black Line Represents the Linear Regression Estimation of the Observed Data

More Recent NIINs Cost More to Repair

Data Represents Demands from FY2002, So There Is No Effect Related to Inflation

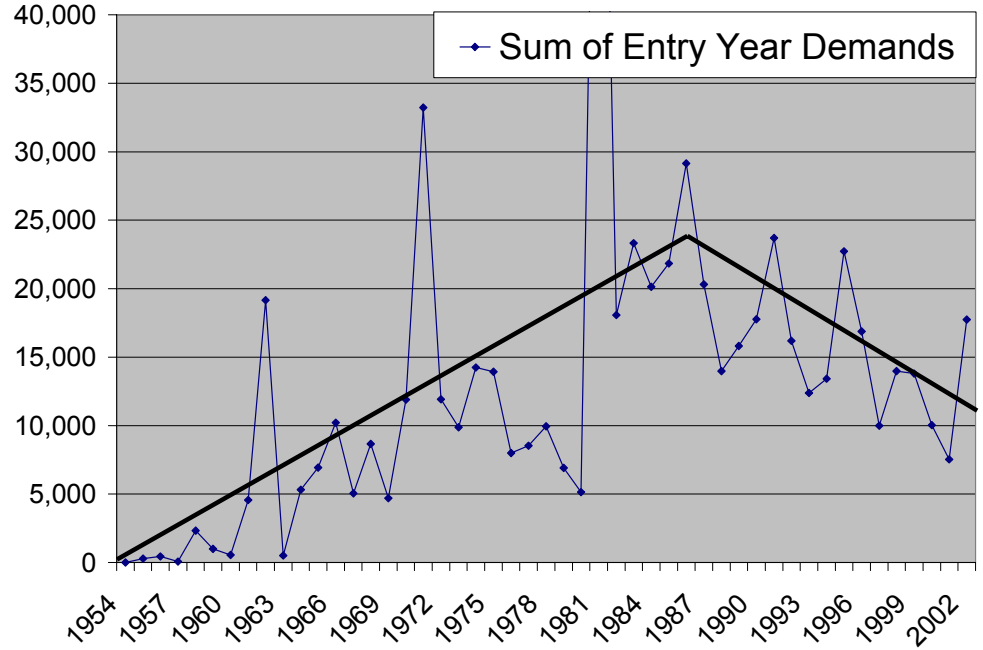
Individual Net Repair Costs Range from $100 to Over $500,000 Per Repair

Includes Over 12,000 Different NIINs with Demand in FY2002

FY2002 Data

NAVICP Demand Data

Sum of Repairable Demands for NIINs with Specific Entry Years: Over 300,000 Demands from Over 12,000 NIINs



NIIN Entry Year

Black Line Is Only a Visual Trace of the Approximate Trend

Data Spike Off the Scale Is for Turbine Rotor Blades

Demands for Repairable NIINs Are Driven by both Failure Rate and Quantity of Systems in Operation

New NIINs Required Several Years to Be Fully Deployed

Some Peaks and Valleys Are Related to Major Weapons System Acquisitions

Single Year Analyses Tend to Have Spikes in Demand from Year to Year

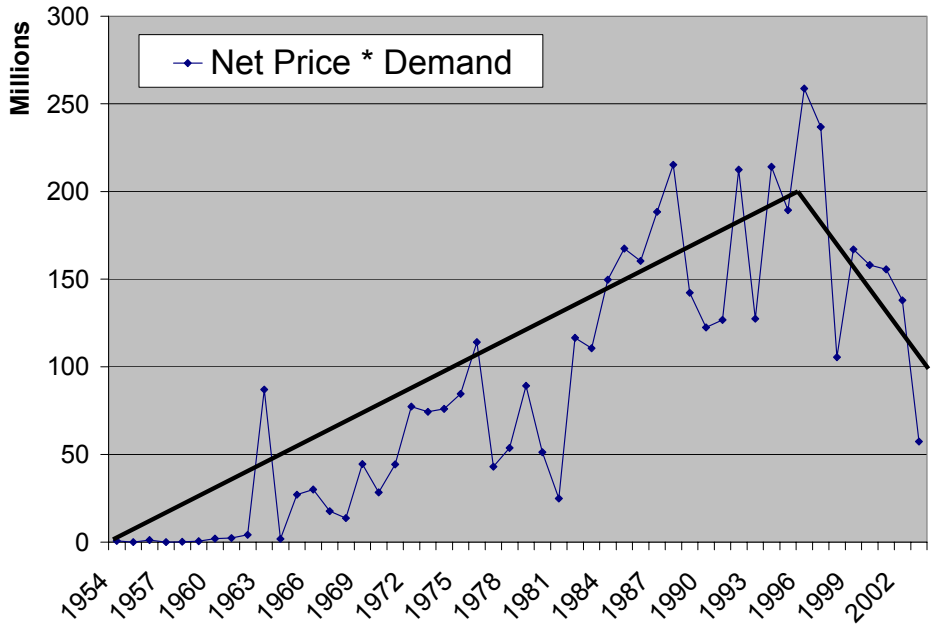
FY2002 Data

NAVICP Demand Data

FY2002 Cost of DLRs by Entry Year

Total Demand: $2.2Billion

New Item Impacts on AVLDR Cost



NIIN Entry Year

Newer NIINs Represent the Largest Portion of the Cost of Repairables

Even the Newest NIINs Impact the Overall Cost of Depot Level Repair

Demand and Cost Trail-Off As Systems Retire

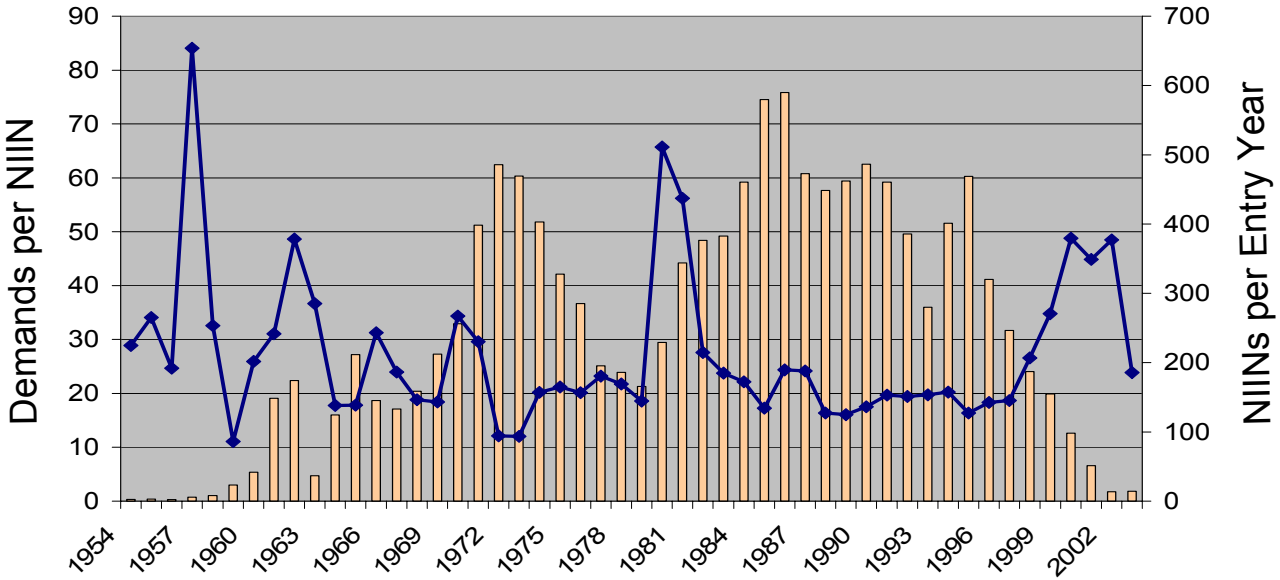
It Is Likely Some New NIINs Will Not Have Any Demand for the Initial Years of Deployment.

Black Line Is Only a Visual Trace of the Approximate Trend

FY2002 Data

NAVICP Demand Data

Number of Failures per NIIN Does Not Appear to Change Significantly Between New and Old NIINs



This Chart Uses Five Years of Data to Reduce Some of the Individual Year Spikes

NIIN Entry Year

The Blue Line Shows the Average Number of Demands per NIIN by Entry Year. It Tends to Be Around 25 Demands per NIIN

The Yellow Bars Show the Number of NIINs from Each Entry Year

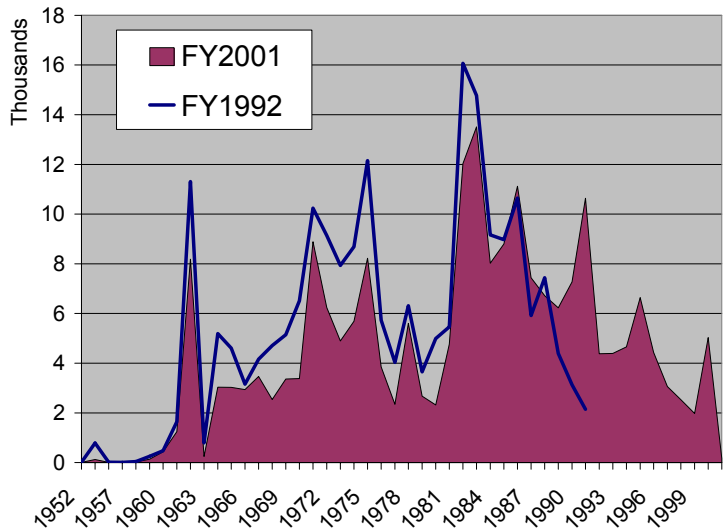
FY1997-2001 Data

NAVICP Demand Data

1992 Compared to 2001Using Center for Naval Analysis Aging Aircraft Study Data

New Item Impacts on AVLDR Cost

Demand



NIIN Entry Year

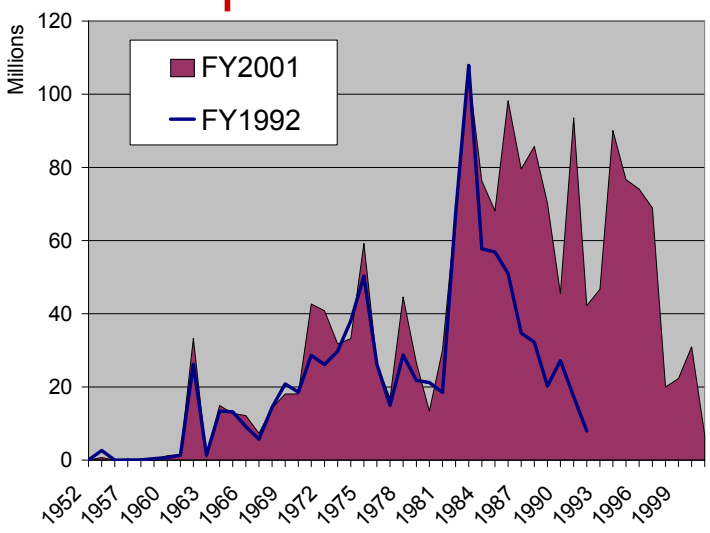
1992 - 209,000 Demands

2001 - 216,000 Demands

Approximately Equal Demand

Does Not Include All TMS

Net Repair Price * Demand



NIIN Entry Year

1992 - $916 Million

2001 - $1,772 Million

Cost of Repair Is Almost Doubled

No New Aircraft Types Have Significantly Influenced the Total Inventory "CNA" Data

New Repairable NIINs Have a Quantifiable Impact on Depot Level Repair (DLR) Cost Growth

- Data Indicate "Generational Growth" or New NIINs Entering the Inventory May Account for as Much as Half of the Annual Depot Level Repair Cost Growth Not Included in Normal Inflation Indices
- Repair Cost for New NIINs Entering the Inventory Has Shown a Continuous Increase Compared to Legacy NIINs in Inventory
- New NIINs Enter the Inventory for Many Reasons:
  - Replace Obsolete NIINs
  - Technology Growth
  - New Mission Requirement
- New Items Entering the Inventory Today Will Have Their Most Significant Impact on Fleet Operations Cost in 8-12 Years

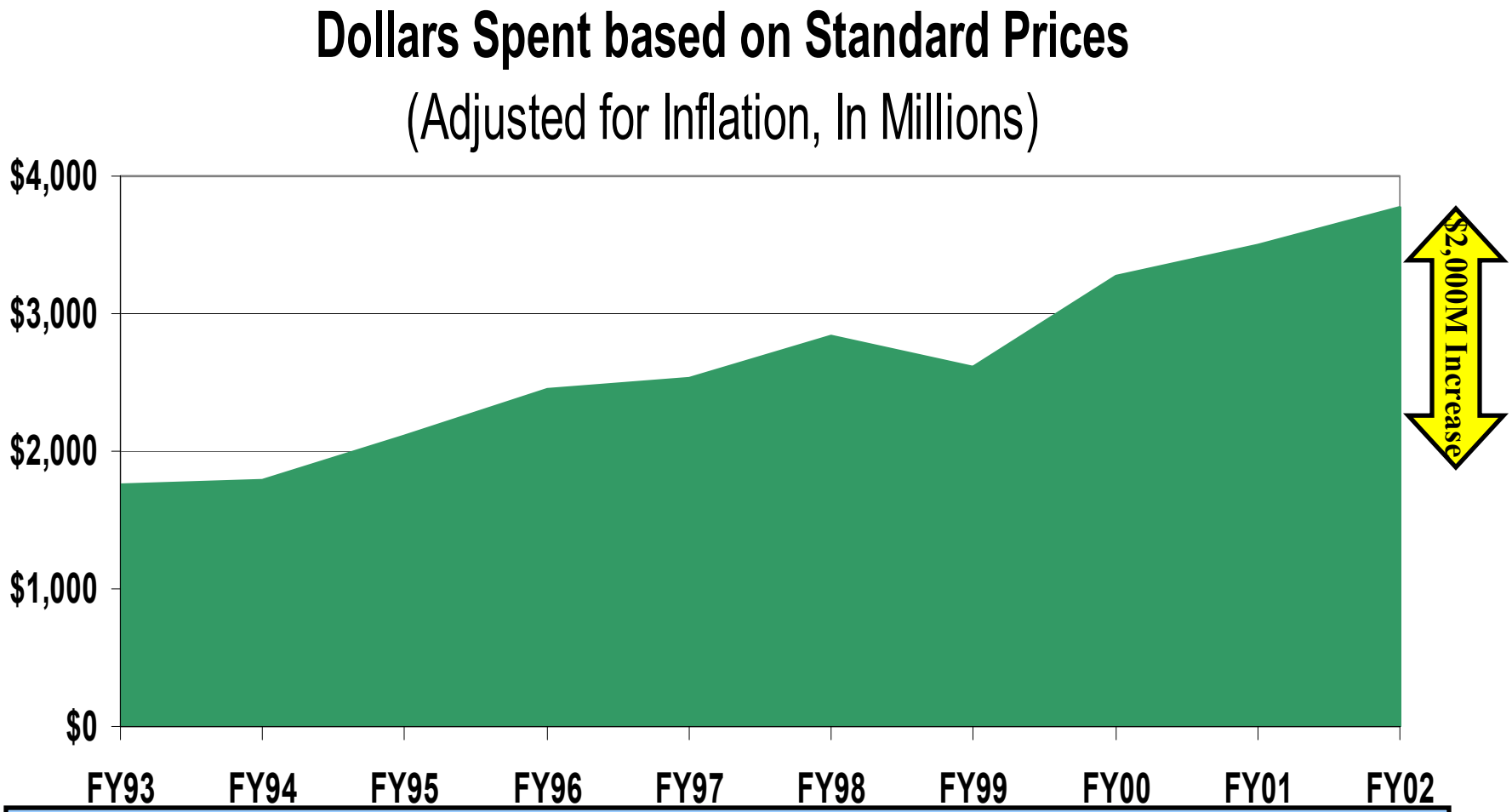
Study To Assess Impact of Changes on DLA Managed Consumable Items

Consumable Cost Increase Analysis

- DLA Funding and NAVAIR Aging Aircraft IPT Directing a Study on Consumable Cost Changes
- Considered as Companion to AVDLR Study
- DLA Database Provided Covering Over 1 million aviation consumables for FY1994 thru FY2003
- Detailed Analysis Conducted Linked to Weapon Systems and Federal Supply Classifications to Identify Focus Areas
- Ongoing Analysis to Investigate Root Causes for Selected NSNs
- NAVAIR Independently Examining Impact of New Items

All Aviation Consumable Items Dollar Demand Chart

Consumable Cost Increase Analysis



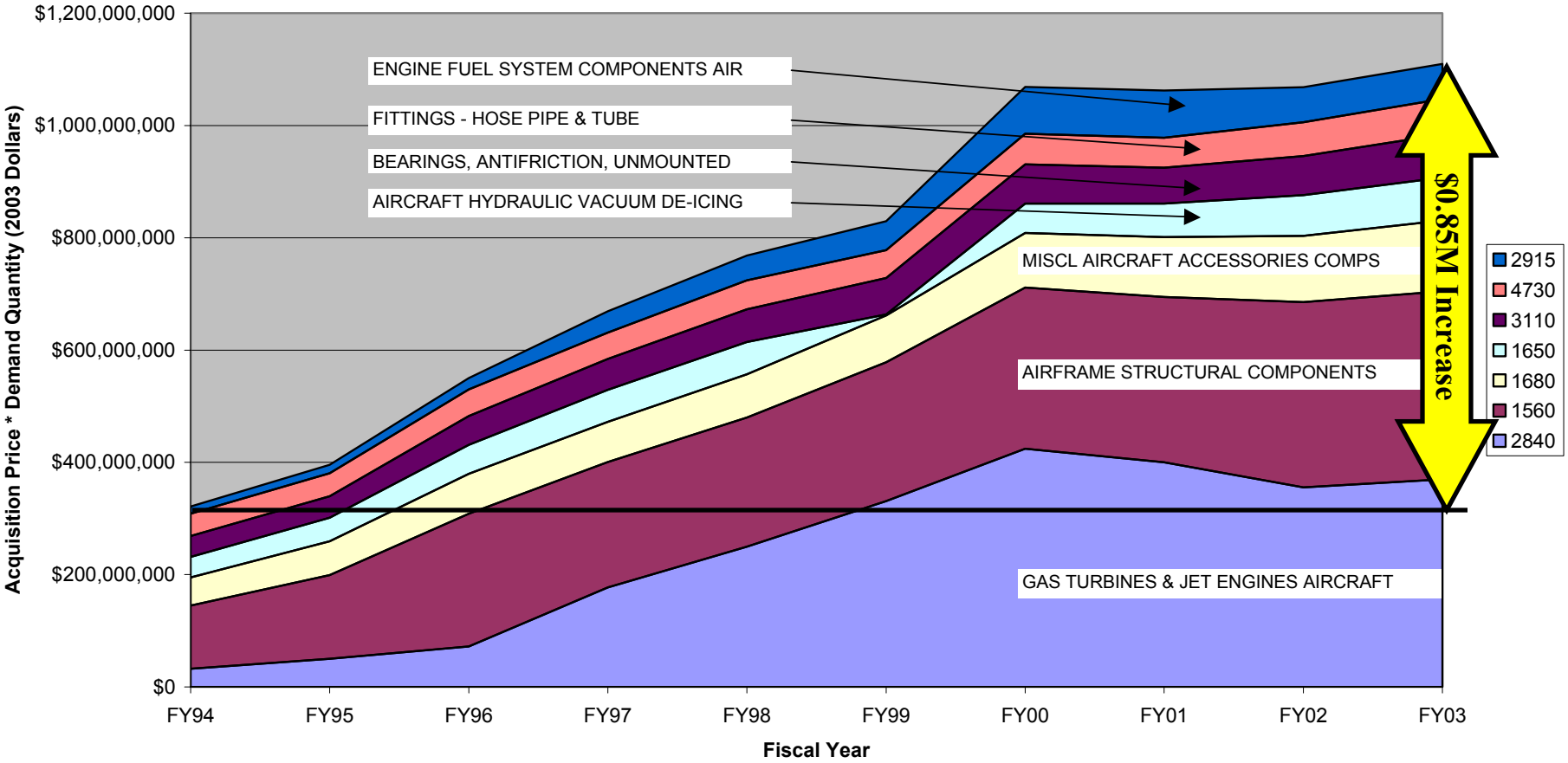
DLA Managed Consumable Items Have Experienced Significant Increases in Acquisition Costs Over Ten Year Period

Demands by Most Significant FSCs

Represent Demand Quantity Times Prices

Consumable Cost Increase Analysis

Seven Federal Supply Classes Account for 1/3 of FY03 DLA Aviation-Item Dollar Demand ($1.1B out of $3.3B)

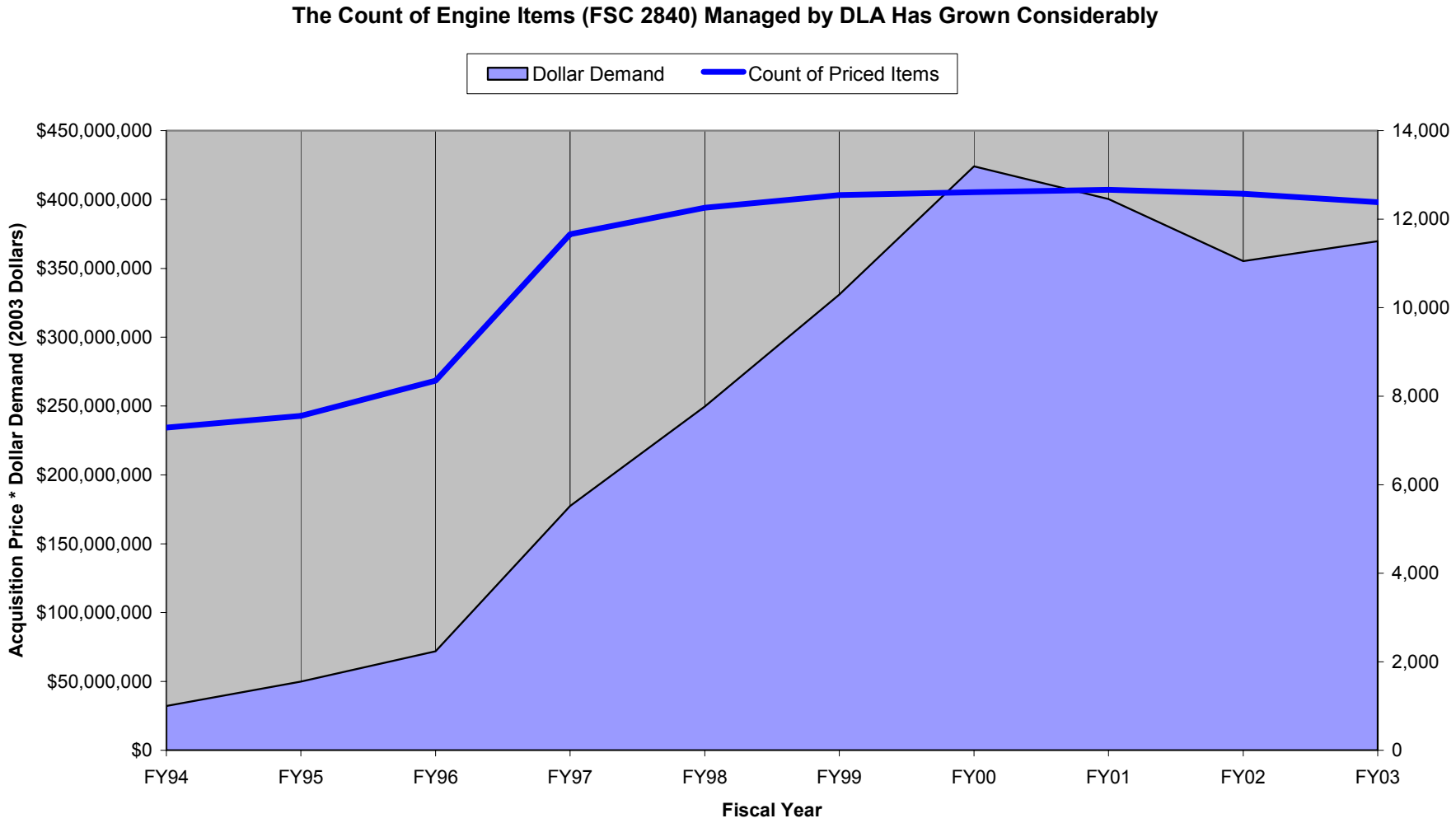


Consumable High Cost Categories Consistent with AVDLR Findings

Gas Turbine and Jet Engines Aircraft Changes

FSC 2840 Demands and NSN Count

Consumable Cost Increase Analysis



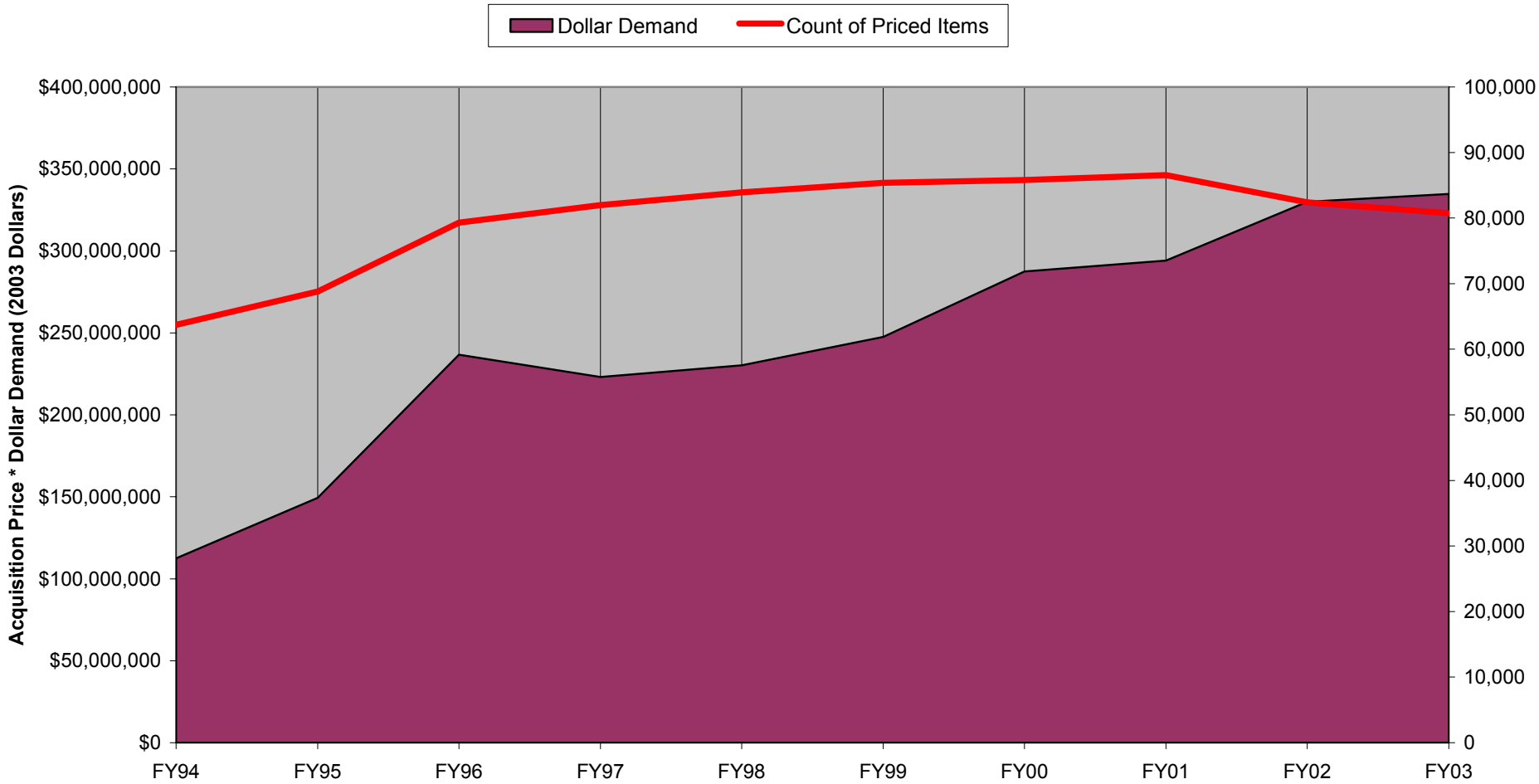
Significant Increase in FSC2840 Demand Culminating in FY1997

Airframe Structural Components Changes

FSC 1560 Demands and NSN Count

Consumable Cost Increase Analysis

The Count of Airframe Structural Items (FSC 1560) Managed by DLA Has Grown Slightly

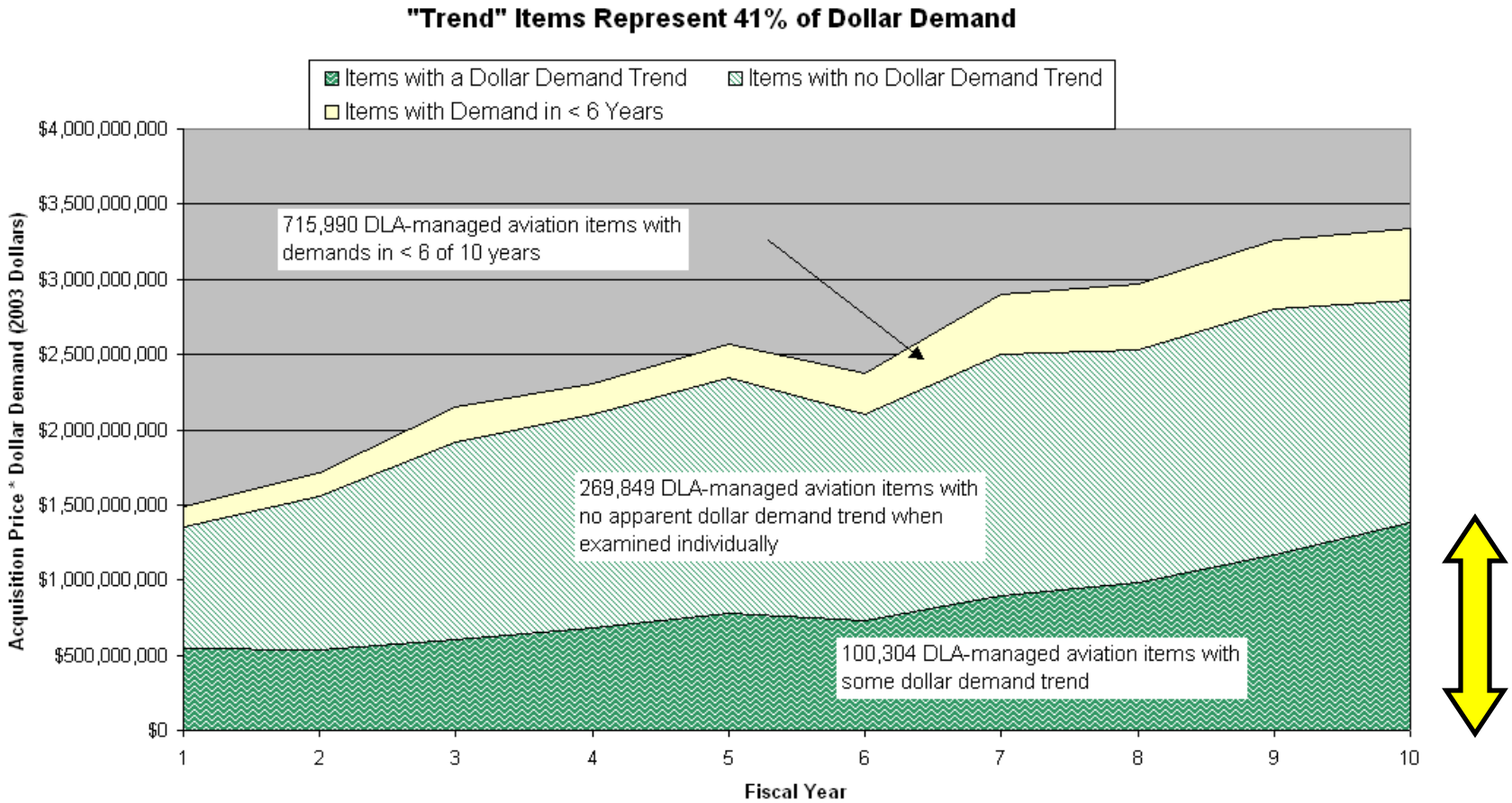


FSC 1560 Demand Mostly Steady with Dramatic Increase in Cost

Cost and/or Demand Observed Growth

Further Investigation Ongoing on Items From "Growth" Group

Consumable Cost Increase Analysis



Regression Analysis Trending Applied to DLA Managed Items
Approximately 100,000 Items Have Clear Demand and/or Cost Trends

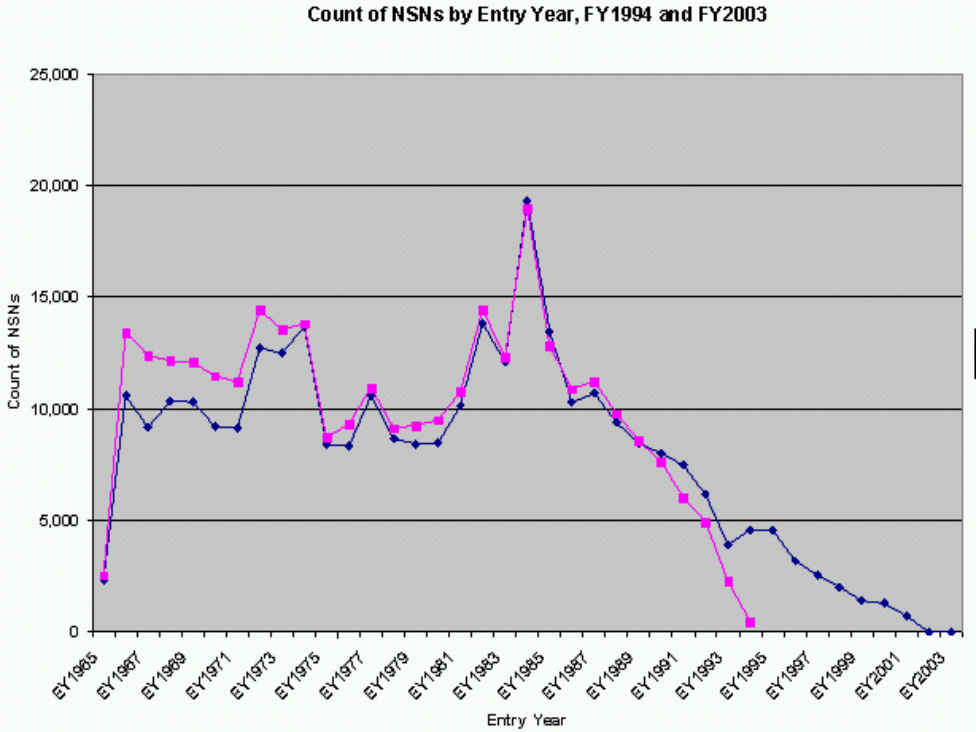
Applying DLR Generational Growth Study Approach to Investigate DLA Consumable Data

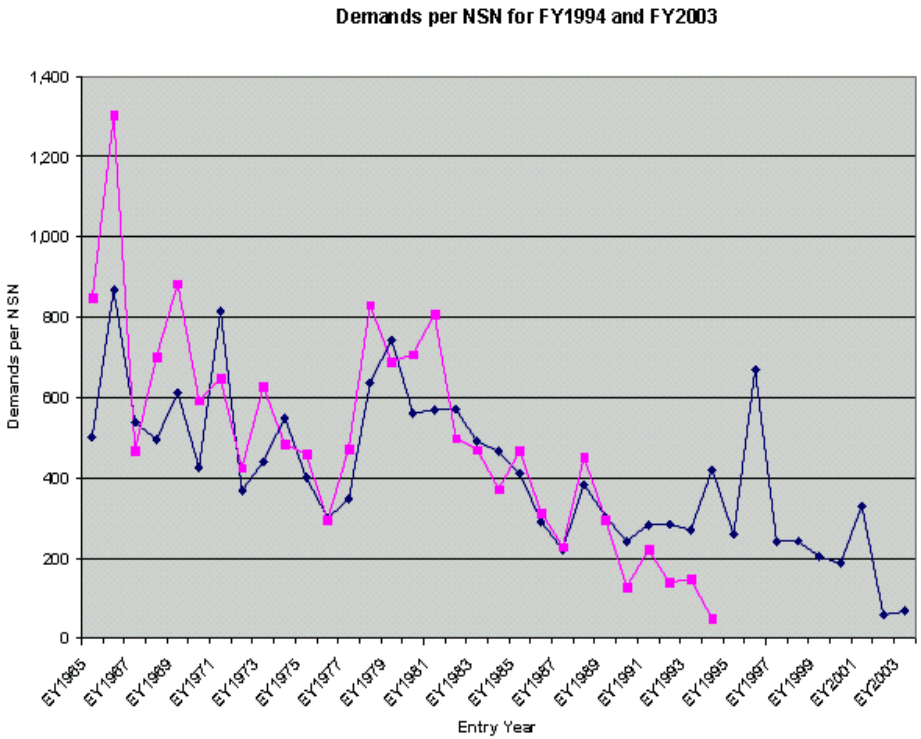
Consumable Generational Cost Growth

- Entry Year Analyses of NIIN Distribution, Demand, Average Acquisition Price and Total Dollar Demand for Consumables Are Similar to Results from the DLR Study
- Data Indicate Consumables Have Considerable Uniform Cost Growth Over Time for All Entry Years Greater than Inflation
- General Observations:
  - DLA consumable acquisition costs are growing at 8-10% per year
  - Normal inflation can account for about 1.3% of the growth
  - New items entering each year can account for perhaps 1%
  - New items in general cost more than older items in the inventory and new items have a ramp up in demand over the first 10-15 years of service. This cost and demand growth result in 3-4% growth annually even with constant overall demand.
  - There is a general trend across all consumables to increase in acquisition cost 3% per year above inflation.

Distribution of NSN Demands Based on Entry Year Into System

Consumable Cost Increase Analysis



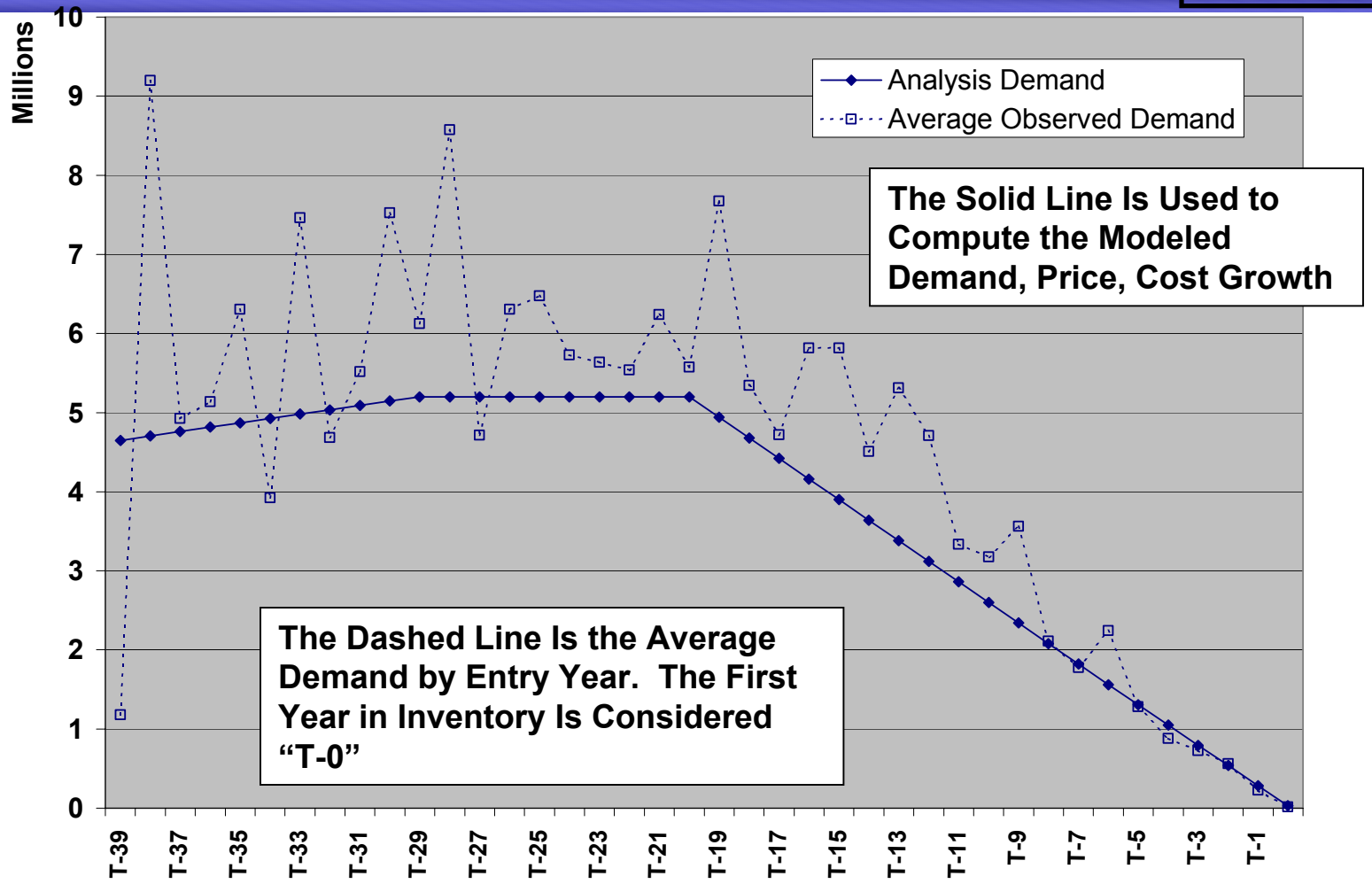


Both NSN Count by Entry Year and Total Demands by Year Comparable between *FY1994* and *FY2003*

Demand Changes ARE NOT Primary Cost Driver

Average Demand by Entry Year Using FY1994, FY1997, FY2000 and FY2003 Data

Consumable Cost Increase Analysis

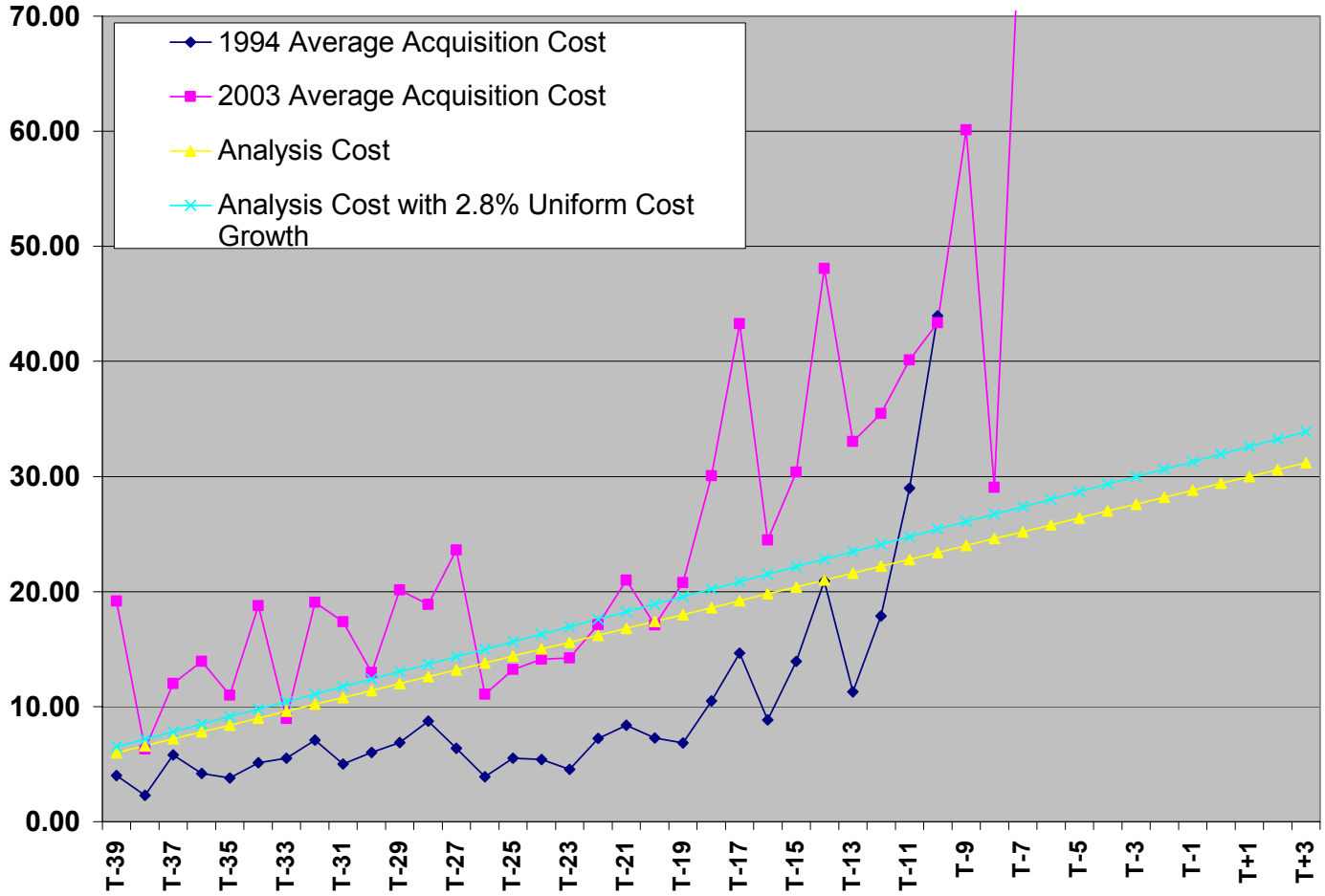


Trend Over Time Related to Date of Entry into Inventory Exhibits Consistent Pattern With New Items Demand Building Over Time

Weighted Average Acquisition Cost by Entry Year

The 1994 and 2003 Acquisition Costs Are Observed
The Analysis Cost Lines Are Used for Modeling Cost Growth

Consumable Cost Increase Analysis



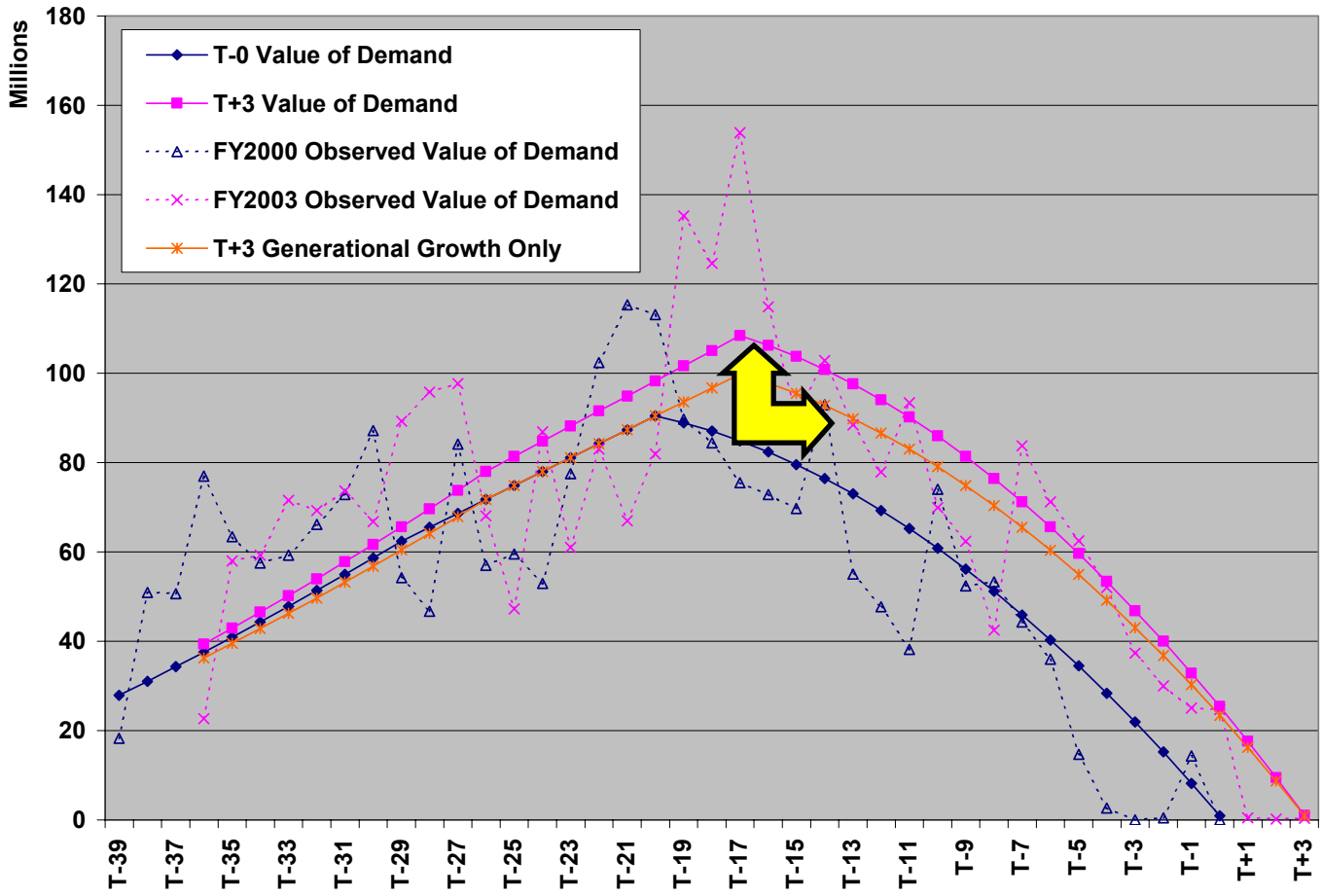
Consumable Items Show Consistent Pattern of Cost Growth Regardless of Entry Age Into the System but New Items Cost More

Cost Growth T-0 to T+3, Assuming Constant Demand

New Items Drive Leading Edge Growth

Uniform Cost Growth Drives Up the Entire Curve

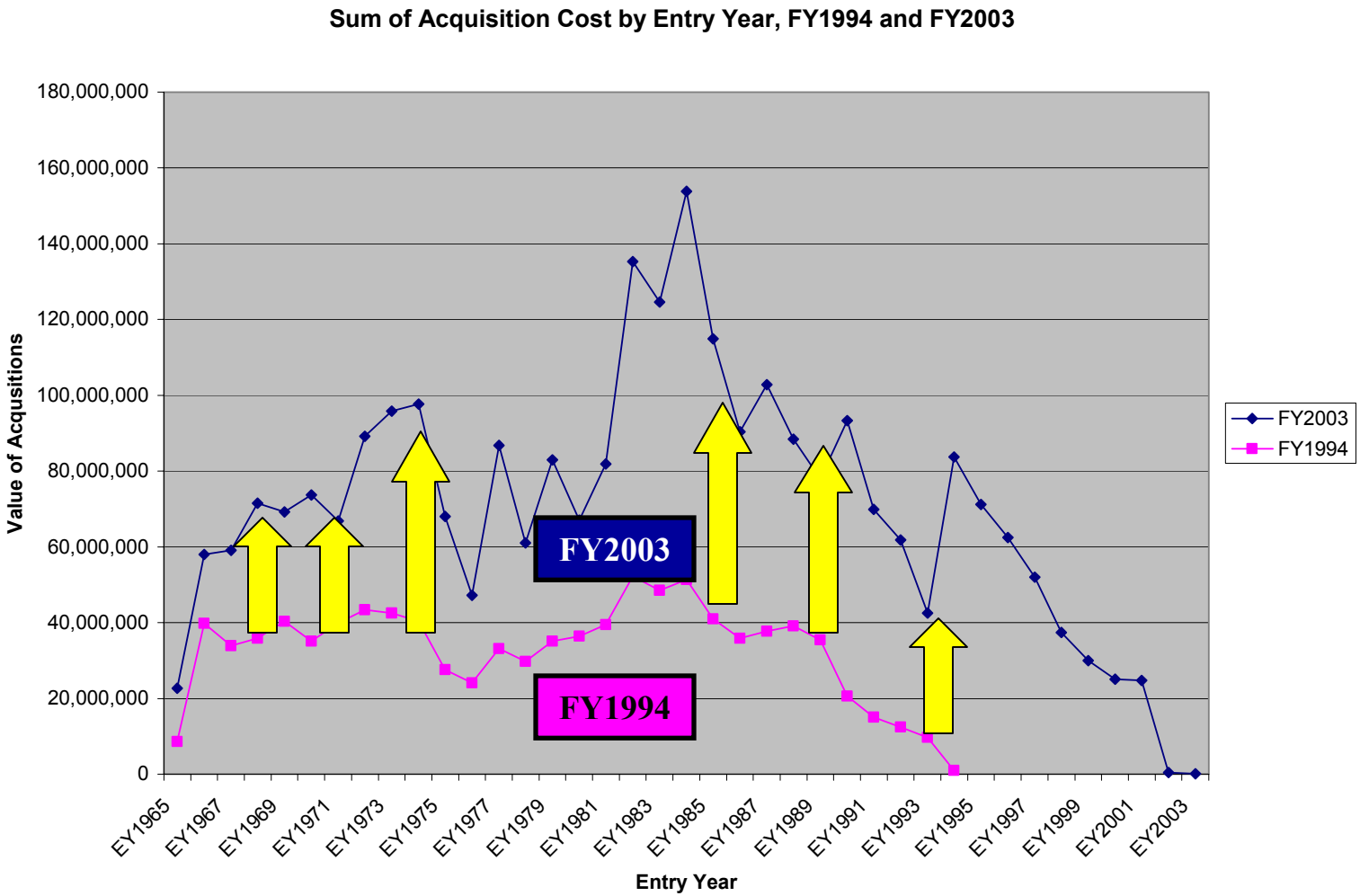
Consumable Cost Increase Analysis



Generational Cost Growth Shifts Value of Demand Curve Higher with Both Demand and Higher Cost as Contributing Factors

Both Old and New Consumable Items Experiencing Significant Cost Increase from FY1994 to FY2003

Consumable Cost Increase Analysis

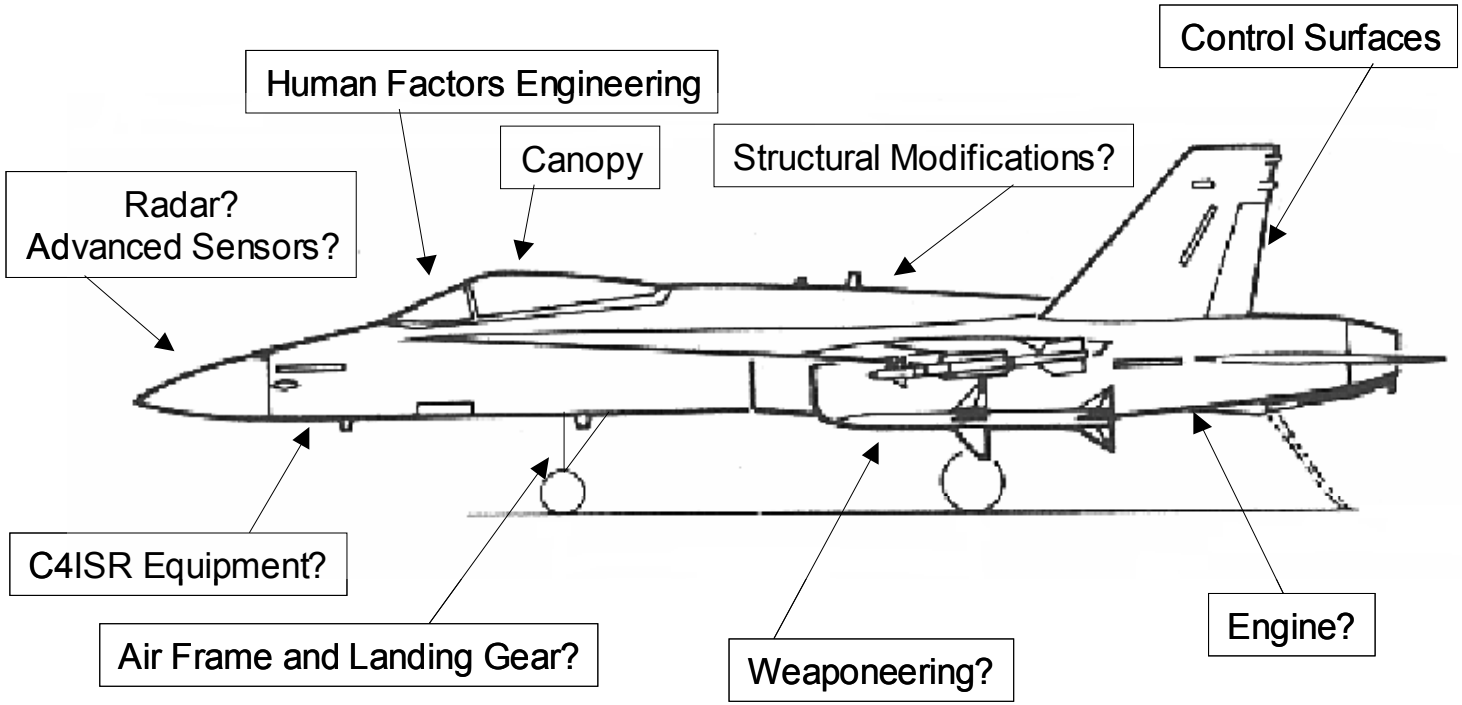


Cost Increases Occurring Across Full Spectrum of Entry Ages

Consumable Conclusions

- **Types of Consumable Material Will Have Unique Cost Growth Curves**
  - **Fasteners Doubled Over the Past Ten Years**
  - **Gas Turbine Engine Parts Increase by Order of Magnitude**
  - **Although Total Demand for Circuit Boards Declined the Acquisition Cost Resulted in an Overall Increase in Total Value of Demand**
- **Consumable Material Makes Up a Significant % of the Cost of Depot Level Repair and May be a Significant Factor in DLR Cost Growth**

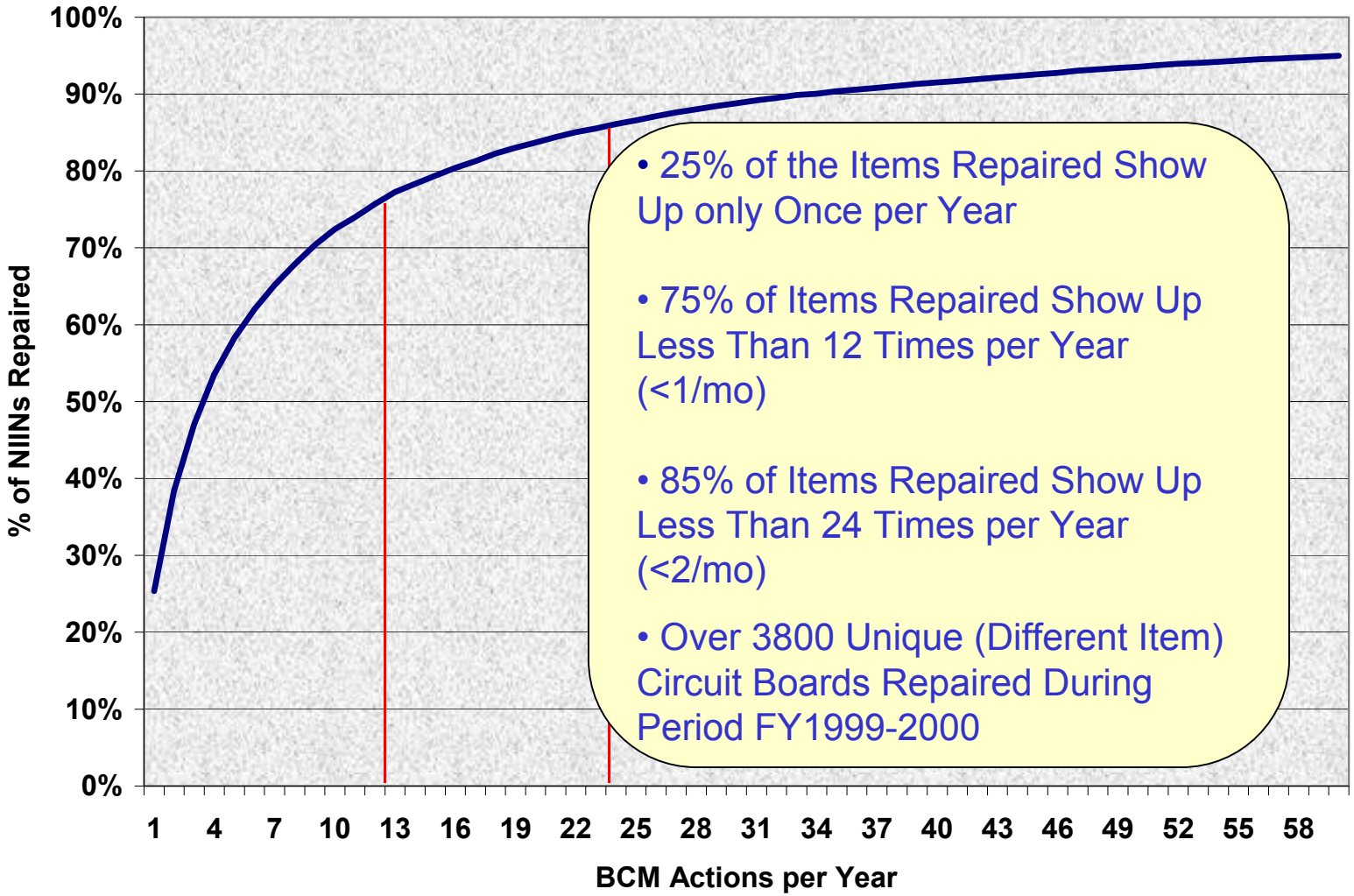
New Parts on Aging Aircraft Significantly Impact Future Costs of Operation



Flying Hour Program Supports Complex Assemblages of Repairable and Consumable Parts Flying in Close Formation Changing Composition of Those Parts Directly Correlates to Changing/Increasing Costs for AVDLR and AFM Accounts

Low Volume Repairs Tied to Lack of Configuration Commonality Drive Costs

Conclusion and Observations



- 25% of the Items Repaired Show Up only Once per Year
- 75% of Items Repaired Show Up Less Than 12 Times per Year (<1/mo)
- 85% of Items Repaired Show Up Less Than 24 Times per Year (<2/mo)
- Over 3800 Unique (Different Item) Circuit Boards Repaired During Period FY1999-2000

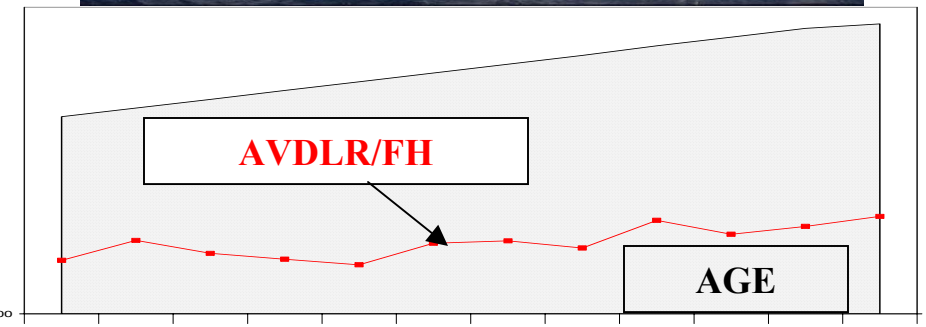
Low Volume Repairs Given 4000+ A/C US Naval Aviation Force

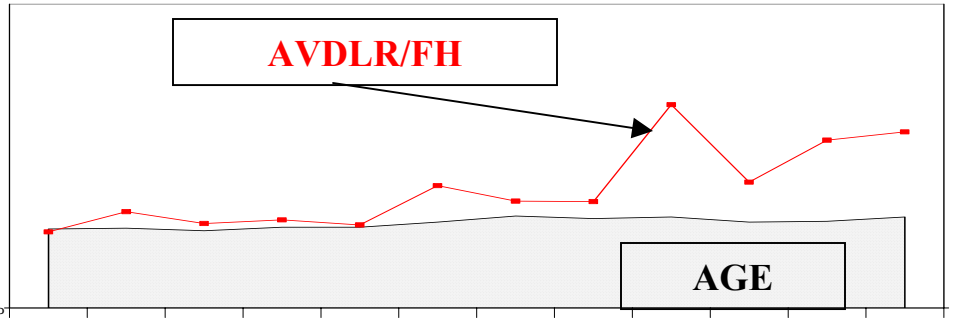
Other Contributing Factors For "Aging Aircraft O&S Cost Growth"

- ✓ Benign Neglect of Key Logistics and Depot Requirements
- ✓ Changes Impacting Supplier Base
- ✓ Inventory Management Policies Including Uneconomic Order Quantities
- ✓ Changing Usage Requirements
- ✓ Budgetary Processes
- ✓ Inadequate/Misunderstood Maintenance Data
- ✓ Lack of Focused Approach to Address Controllable "Age" Factors

Age Analysis Conclusion: O&S Cost Changes Over Time

There is A Complex Calculus Associated with the Issue of Age and Operations and Support Cost Growth within US Naval Forces. Although Age is a very Significant Contributor Other Factors Identified In this Briefing Must Also be Addressed in a Comprehensive Strategy to Mitigate Operations and Support and FHP Cost Growth





Public Affairs Office Clearance

Analysis of Operations and Support Cost Trends
or
Why do Aging Aircraft Cost so Much

Briefing for Ageing Aircraft Forum
October 6-8, 2004

Dr. Laurence W. Stoll
NAVAIR Cost Department/Aging Aircraft IPT

NAVAIR

Ageing Aircraft Forum Attendees

As a member of the NAVAIR cost department I have been involved in the cost analysis of aging issues over a significant portion of my career. My area of emphasis has been in the cost analysis and estimating associated with providing sustaining operations and maintenance for both new and legacy aviation systems. I will be sharing with you some of our more recent research findings and suggest a number of potential areas of emphasis for future investigation.

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9 Sep 04
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NAVAL AIR SYSTEMS COMMAND
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