

# ***Headquarters U.S. Air Force***

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*Integrity - Service - Excellence*



## **Air Force Aircraft Maintenance Metrics**

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# Overview

- **Why?**
- **Strategic Landscape**
  - AF Priorities
  - Today's Fiscal Environment
- **Maintenance Metrics Background**
- **Where we are**
- **Where we are going: Aircraft Availability**





# Performance Metrics for Maintenance—Why?

- Tenets of performance analysis
  - AF flies, fixes and launches weapons systems
  - Focus on these processes
  - Metrics and standards build clear expectations
  - Comparison is good



**The purpose of analysis is not analysis...the purpose of analysis is insight.**



# USAF Priorities



***Our priorities are clear:***

- Winning the Global War on Terrorism***
- Developing and caring for our Airmen***
- Modernizing and recapitalizing our aircraft and equipment***

***- 2006 Air Force Posture Statement***



***The U.S. Air Force must remain ready to Fly and Fight***





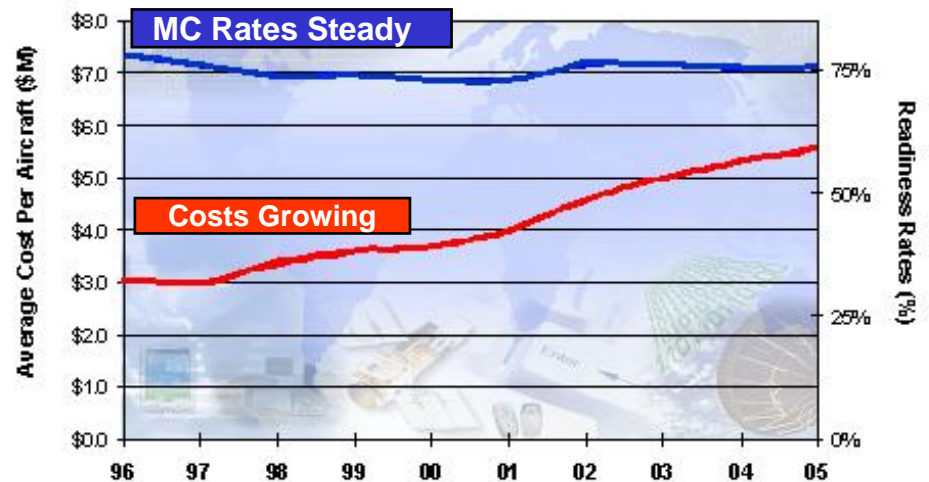
# Today's Fiscal Environment

**Cost to Operate  
the Fleet**

**Aging Aircraft  
Inventory**

**Fiscal  
Environment**

## Increasing Operating Costs



***Aircraft readiness rates steady, but costs to  
operate and maintain fleet over the last  
decade are up 87%***



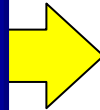
# Today's Fiscal Environment



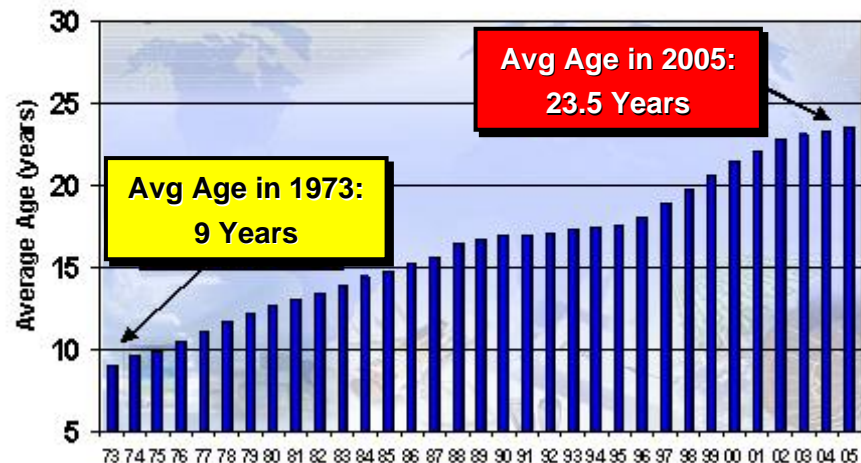
Cost to Operate  
the Fleet

Aging Aircraft  
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Environment



## Increasing Age of Aircraft



***Aging alone is not the issue – it is the decreasing military utility of some aircraft***



# Today's Fiscal Environment



Cost to Operate  
the Fleet

Aging Aircraft  
Inventory

Fiscal  
Environment

## Fiscal Realities



***Budget growth is slowing***



# Scope

## Total USAF Aircraft Inventory

|               |     |                      |      |                |     |               |     |
|---------------|-----|----------------------|------|----------------|-----|---------------|-----|
| <b>A/OA10</b> | 356 | <b>C-9</b>           | 3    | <b>MC-130</b>  | 62  | <b>T-51</b>   | 3   |
| <b>AC-130</b> | 23  | <b>CV-22</b>         | 4    | <b>MH-53</b>   | 31  | <b>T-6</b>    | 272 |
| <b>AT-38</b>  | 7   | <b>E-3</b>           | 32   | <b>MQ-1</b>    | 82  | <b>TC-130</b> | 1   |
| <b>B-1</b>    | 67  | <b>E-4</b>           | 4    | <b>MQ-9</b>    | 5   | <b>TC-135</b> | 3   |
| <b>B-2</b>    | 21  | <b>E-8</b>           | 17   | <b>NC-130</b>  | 1   | <b>TE-8</b>   | 1   |
| <b>B-52</b>   | 94  | <b>EC-130</b>        | 24   | <b>NC-135</b>  | 1   | <b>TG-10</b>  | 21  |
| <b>C-12</b>   | 28  | <b>F117</b>          | 52   | <b>NKC-135</b> | 2   | <b>TG-12</b>  | 1   |
| <b>C-130</b>  | 486 | <b>F-15A-D</b>       | 485  | <b>OC-135</b>  | 2   | <b>TG-14</b>  | 14  |
| <b>C-17</b>   | 157 | <b>F-15E</b>         | 223  | <b>RC-135</b>  | 22  | <b>TG-15</b>  | 5   |
| <b>C-20</b>   | 11  | <b>F-16A-D</b>       | 1317 | <b>RC-26</b>   | 11  | <b>TU-2</b>   | 5   |
| <b>C-21</b>   | 76  | <b>F-22</b>          | 73   | <b>RQ-4</b>    | 7   | <b>U-2</b>    | 29  |
| <b>C-32</b>   | 6   | <b>HC-130</b>        | 33   | <b>T-1</b>     | 179 | <b>UH-1</b>   | 92  |
| <b>C-37</b>   | 9   | <b>HH-60</b>         | 101  | <b>T-37</b>    | 204 | <b>UV-18</b>  | 3   |
| <b>C-38</b>   | 2   | <b>KC-10</b>         | 59   | <b>T-38</b>    | 495 | <b>VC-25</b>  | 2   |
| <b>C-40</b>   | 7   | <b>KC-135D/E/R/T</b> | 533  | <b>T-41</b>    | 4   | <b>WC-130</b> | 22  |
| <b>C-5</b>    | 108 | <b>LC-130</b>        | 10   | <b>T-43</b>    | 8   |               |     |

**Grand Total**

**6018**





# Performance Metrics Influence Behavior

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- Regular reviews of Weapon System performance indicators and standards should communicate leadership's priorities
  - Clear understanding of desired outcomes has a positive affect on personnel performance
- Analysis of performance provides leadership with a way to gauge fleet health and combat capability
- Aircraft performance metrics based primarily on data input into the maintenance and supply information systems
- Air Force develops and publishes metrics standards and goals

**Leaders need information, not just data**



# Maintenance Metrics – Standards Methodology

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- **Factors used for MC Rate Standard**
  - Validated operational requirements documents
  - Flying hour program (FHP)
  - PAA, UTE, Attrition rates, Spares, Turn Pattern, Fly Days
- **NMCM Rate Standard**
  - Calculated from “known” Sched Mx requirements based on FHP + historical unsched mx trend
  - A realistic approximation of what is required and attainable
- **NMCS Rate Standard**
  - Ties TNMCS standard to spares funding/requirements

**GOAL: Ops-based and Resource-driven**



# Maintenance Metrics— Levels of Analysis

- Conduct detailed analysis at different levels:
  - Unit Level—AMU/Flying Squadron Team
  - Base/Command Level—Compare like units
  - Enterprise Level—Lead MAJCOM/Program Manager Teams



*We need to give our maintainers a tool to achieve  
“Excellence In All They Do”*



# Key Maintenance Metrics at Unit Level

- **Mission Capable (MC) Rate**
  - Includes FMC and PMC hours
- **Total Not Mission Capable Supply / Maint (TNMCS / M)**
- **Abort Rate (Ground/Air)**
- **Break/Fix Rate**
- **Repeat/Recur Rate**
- **Cannot Duplicate Discrepancy Rate**
- **Deferred Discrepancy Rate**
- **Cannibalization Rate**
- **Maintenance Scheduling Effectiveness**
- **Flying Scheduling Effectiveness**
- **Flow Days**
  - Phase/Isochronal Inspection
  - PDM/Modification







# Key Maintenance Metrics at Unit Level (cont.)

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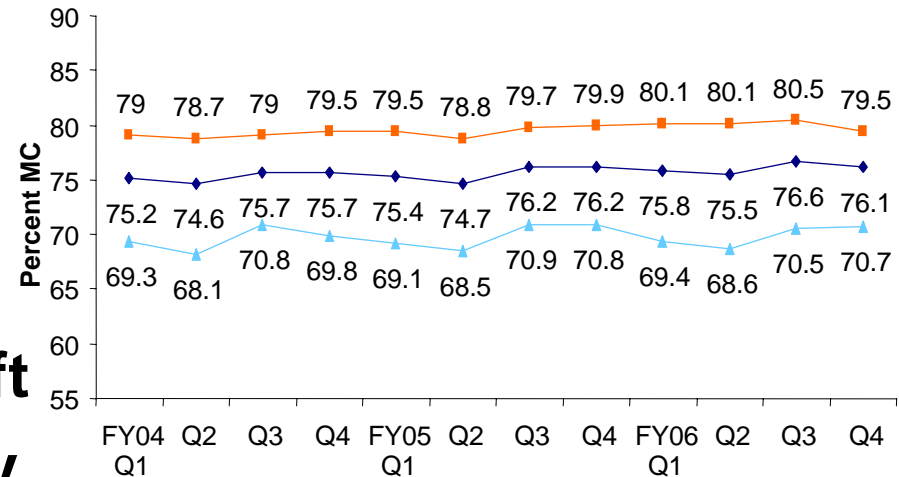
- **Utilization Rate—Combat Air Forces**
  - Number of sorties per month
  - Provides maintainer feedback on maintenance contribution to ops/mx team
- **Departure Reliability—Airlift**
  - Did the mission get off on time?
  - Provides maintainer feedback on maintenance contribution to ops/mx team



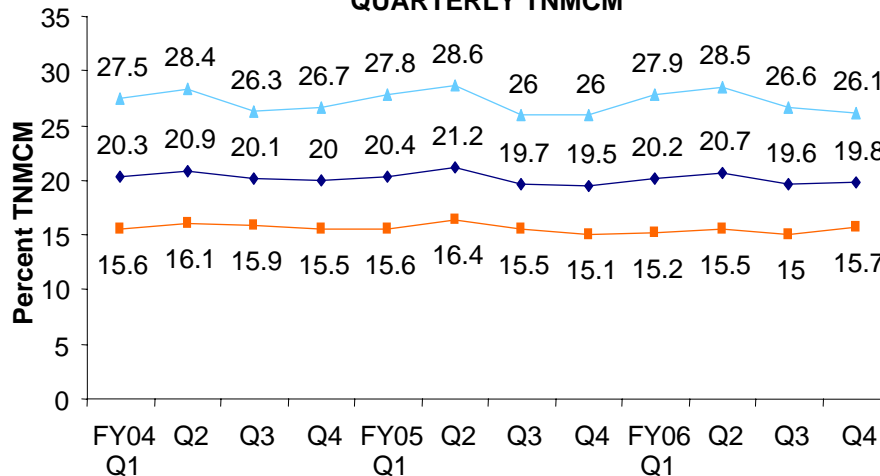
# Key Maintenance Metrics for Fleet Management

- Focus on Trends
  - MC/NMCM/NMCS
  - Manhours / flying hour
  - Cost / flying hour
  - Depot Possessed Aircraft
  - UTE/Departure Reliability

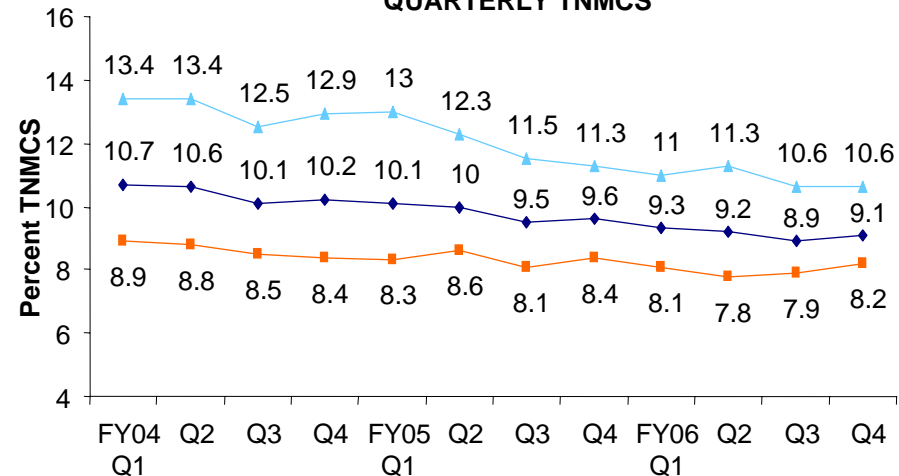
QUARTERLY MC RATES



QUARTERLY TNMCM



QUARTERLY TNMCS

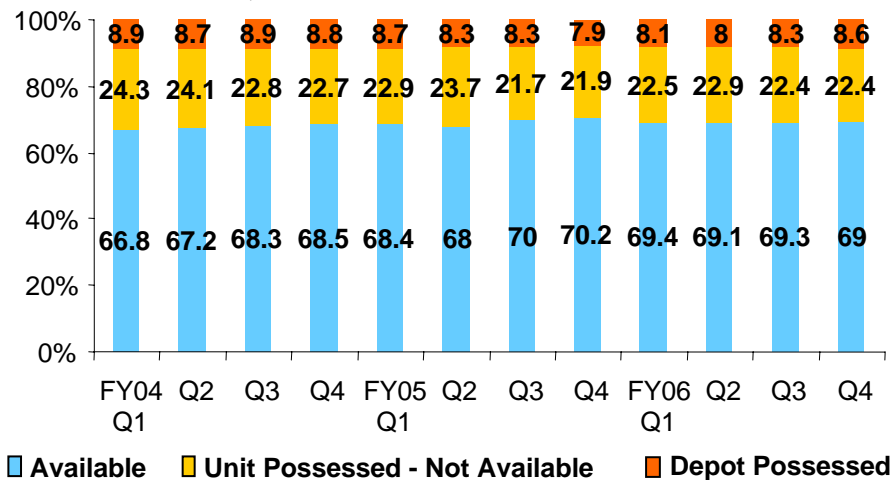




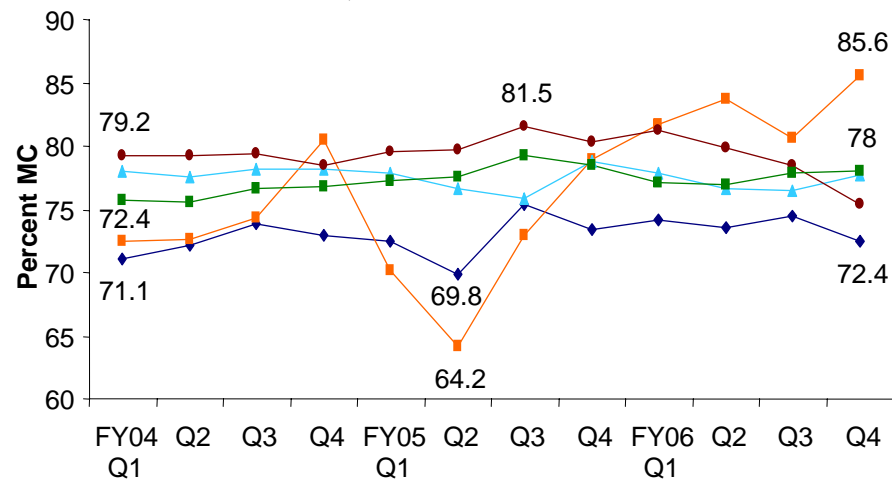
# Fighters

- A-10
- F-15E
- F-117
- F-16
- F-15

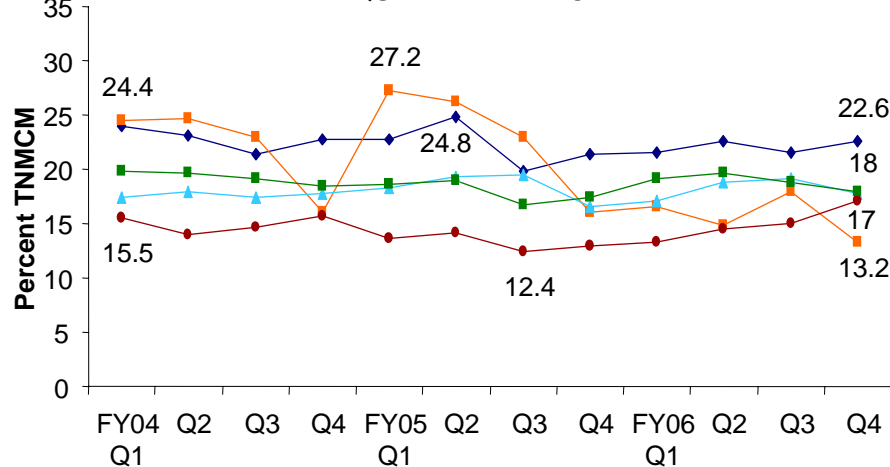
### QUARTERLY AVAILABILITY RATES



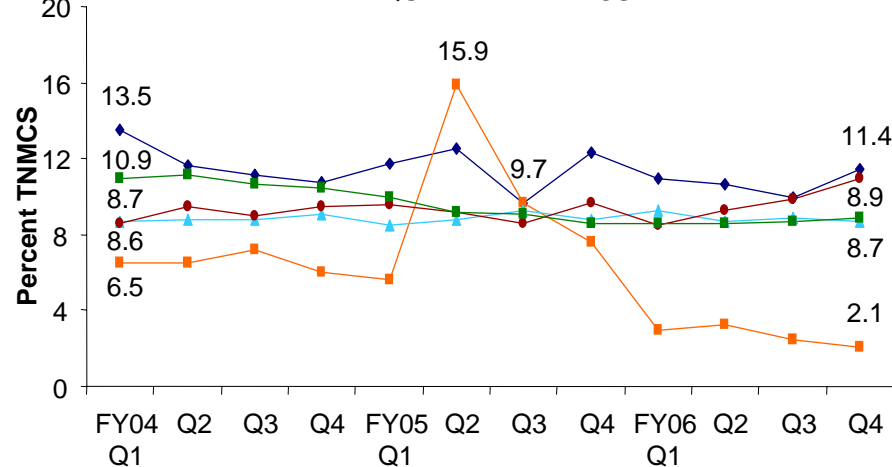
### QUARTERLY MC RATES



### QUARTERLY NMCM



### QUARTERLY NMCS





# Fighter Mission Capable Rates

## 4<sup>th</sup> Quarter '06

| MD<br>Active/ARC       | Active       |              |              | AFRC/NGB     |              |              | Availability<br>FY06 Target/AAIP Goal |
|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------------------------------|
|                        | MC           | TNMCM        | TNMCS        | MC           | TNMCM        | TNMCS        |                                       |
| A-10<br>203/153 Std    | 75.0<br>↓ 81 | 19.3<br>↑ 17 | 10.7<br>↑ 8  | 69.1<br>↑ 71 | 26.8<br>↓ 29 | 12.2<br>↑ 8  | 60.9<br>↓                             |
| F-15A/B<br>94 Std      | N/A          | N/A          | N/A          | 72.6<br>↑ 73 | 24.7<br>↓ 27 | 9.8<br>↑ 8   | N/A                                   |
| F-15C/D<br>344/47 Std  | 80.3<br>↑ 81 | 14.5<br>↓ 14 | 8.0<br>↓ 8   | 70.4<br>↓ 75 | 24.8<br>↑ 25 | 11.2<br>↑ 8  | 69.0<br>↑ 69.8 76.4                   |
| F-15E<br>223 Std       | 75.4<br>↓ 80 | 17.0<br>↑ 14 | 10.9<br>↑ 10 | N/A          | N/A          | N/A          | 66.3<br>↓ 72.2 79.5                   |
| F-16A/B<br>49 Std      | N/A          | N/A          | N/A          | 81.0<br>↑ 71 | 16.3<br>↓ 26 | 5.1<br>↓ 10  | 71.2                                  |
| F-16C/D<br>713/542 Std | 82.6<br>↓ 82 | 12.6<br>↔ 11 | 7.6<br>↑ 10  | 71.8<br>↔ 73 | 24.9<br>↓ 27 | 10.9<br>↑ 10 | 70.7 82.1<br>↔                        |
| F-22<br>73 ACC Goal    | 59.4<br>↓ 74 | 26.8<br>↑ 19 | 21.1<br>↑ 16 | N/A          | N/A          | N/A          | N/A                                   |
| F-117<br>52 Std        | 85.6<br>↑ 76 | 13.2<br>↓ 22 | 2.1<br>↓ 5   | N/A          | N/A          | N/A          | N/A                                   |





# Future Focus—Aircraft Availability

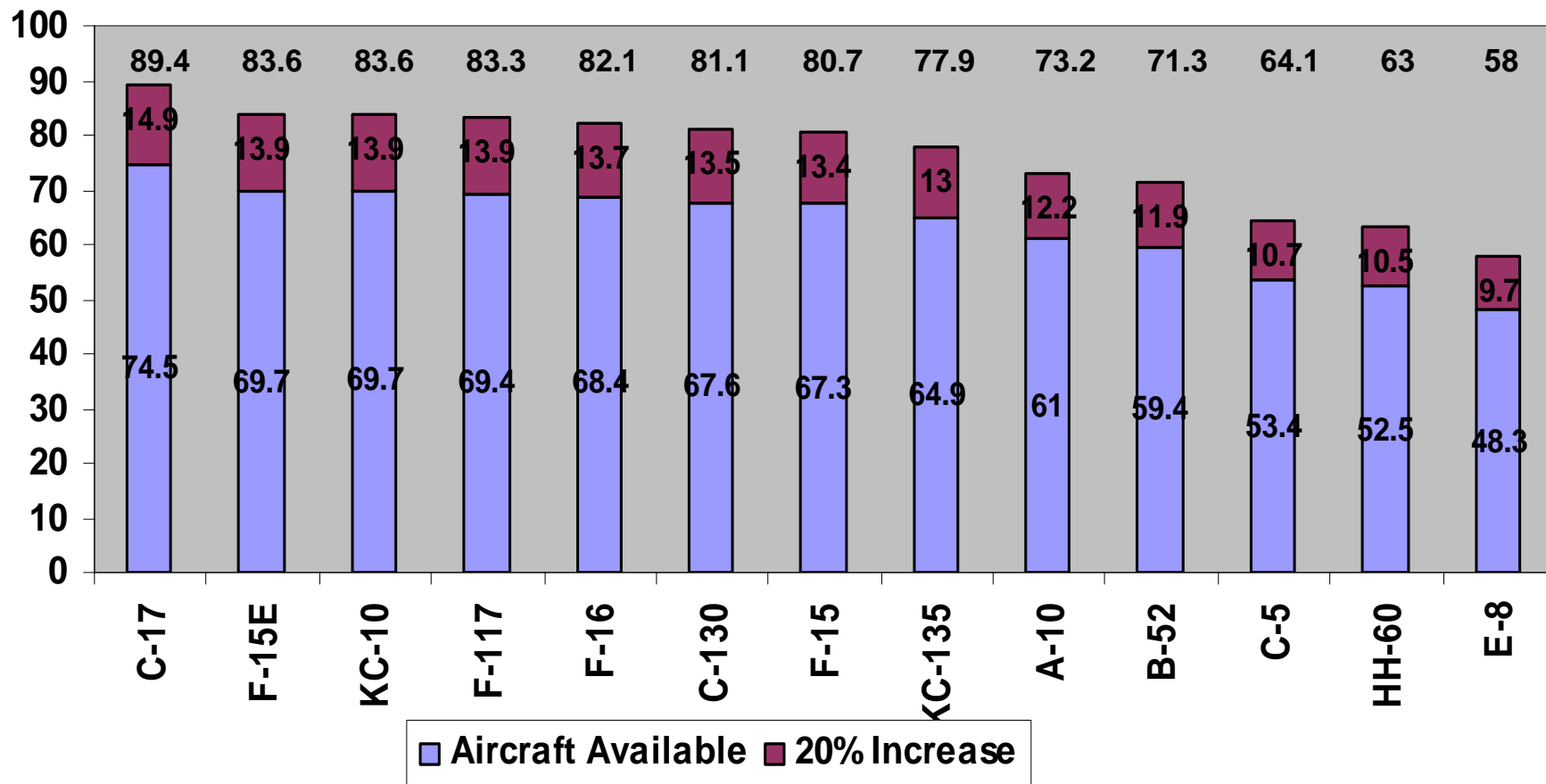
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- **Enterprise Approach-- forward looking**
  - Teaming lead commands with program managers
  - Maximize resource allocation
- **Address combat capability “how many aircraft ready?”**
  - Drivers are MC, NMCM, and NMCS rates
  - Includes Depot, Mod, TCTO, and other fleet management factors
  - No standards – MDS/fleet AA rate improvement goals
- **Aircraft Availability Improvement Plans (AAIP)**
  - Aim is to meet eLog21 Goals
  - Increase Equipment Availability by 20%
  - Decrease O&S Cost by 10%





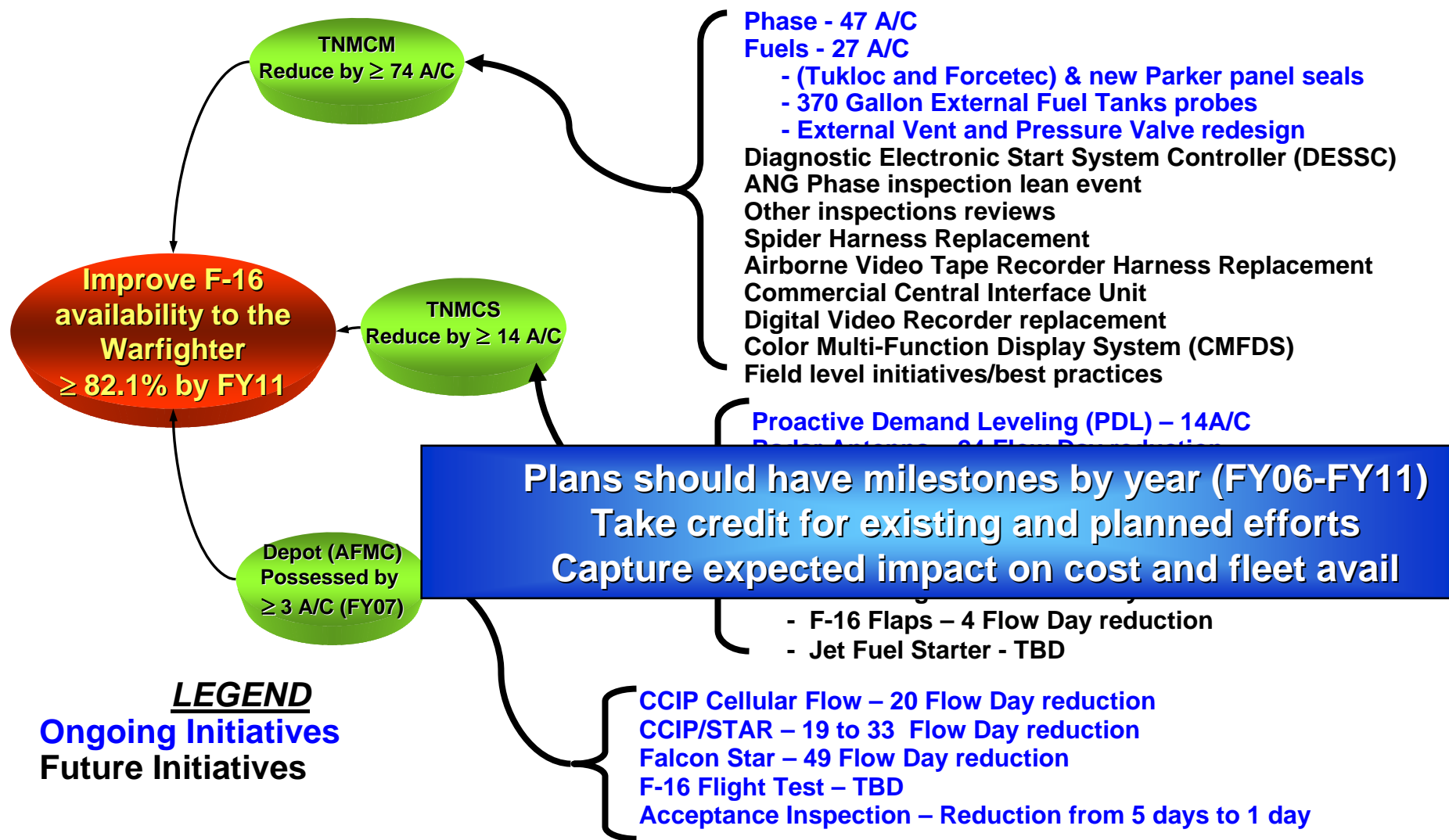
# eLog21 Goals – Aircraft Availability



**20% Increase**



# Example: F-16 Availability Improvement Initiatives





# Maintenance Metrics— “The Key”

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- Documentation and data integrity are only as good as you make them
- Performance Indicators, standards, and analysis are tools used to understand processes
- You have to apply the analysis of the data effectively
- What is watched improves
- What is watched and compared improves more
- What is compared and rewarded improves dramatically







# Questions?

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**U.S. AIR FORCE**