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# AERIAL REFUELING DSB TASK FORCE

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## KC-135 issues

- Are we in trouble
- How many do we need
- What makes sense for near-term steps

# KC-135 Program of Record

- Retire 61 E-Models FY04-06/aircrews retained

MDS	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
KC-135E	112	71	63	63	63	63	63	63
KC-135R	417	417	417	417	417	417	417	417
KC-10	59	59	59	59	59	59	59	59
<b>TOTAL</b>	<b>588</b>	<b>547</b>	<b>539</b>	<b>539</b>	<b>539</b>	<b>539</b>	<b>539</b>	<b>539</b>

- Funding in FY05 President's Budget Request

	FY06	FY07	FY08	FY09	FY10	FY11	TOTALS
(\$M)							
KC-135 Replacement	154.0	369.7	1,385.2	2,128.6			4,033.9

# KC-135 History

- Total of 732 KC-135A airframes procured from the mid-50s to the mid-60s as an “interim tanker”
- Procured at rates of 75 to 100 year
- Current airframe average age of 44 years
- All upgraded to E or R models
  - Engine upgrade for E-models limits it to .8 fuel transfer capability of an R-model (KC-10 = 1.95xR-model)

# Are we in Trouble?

- Fatigue life is 36K hours for an E and 39K for an R
  - Current airframe hours average at 16K
- Based on fatigue life, airframe capable to 2040
- Corrosion is asserted to be an increasing problem by USAF; is it severe enough or irreversible enough to change the replacement dynamics?

# DSB Corrosion Findings

- ④ • Air Force has a robust corrosion control program
- ④ • Because these aircraft are in depot every 5 years, most have had 3 or 4 depot periods since corrosion became an issue in the late 80's  
*↳ AF date in major structural repairs is not going up.*
- ④ • Depot Major Structural Repairs (MSRs) appear to be decreasing
- ④ • Consensus view on corrosion was that it is manageable – DSB structural experts, commercial entities (FEDEX), other government entities (DoN and USAF 2001 ESLs)

# Corrosion Control Program

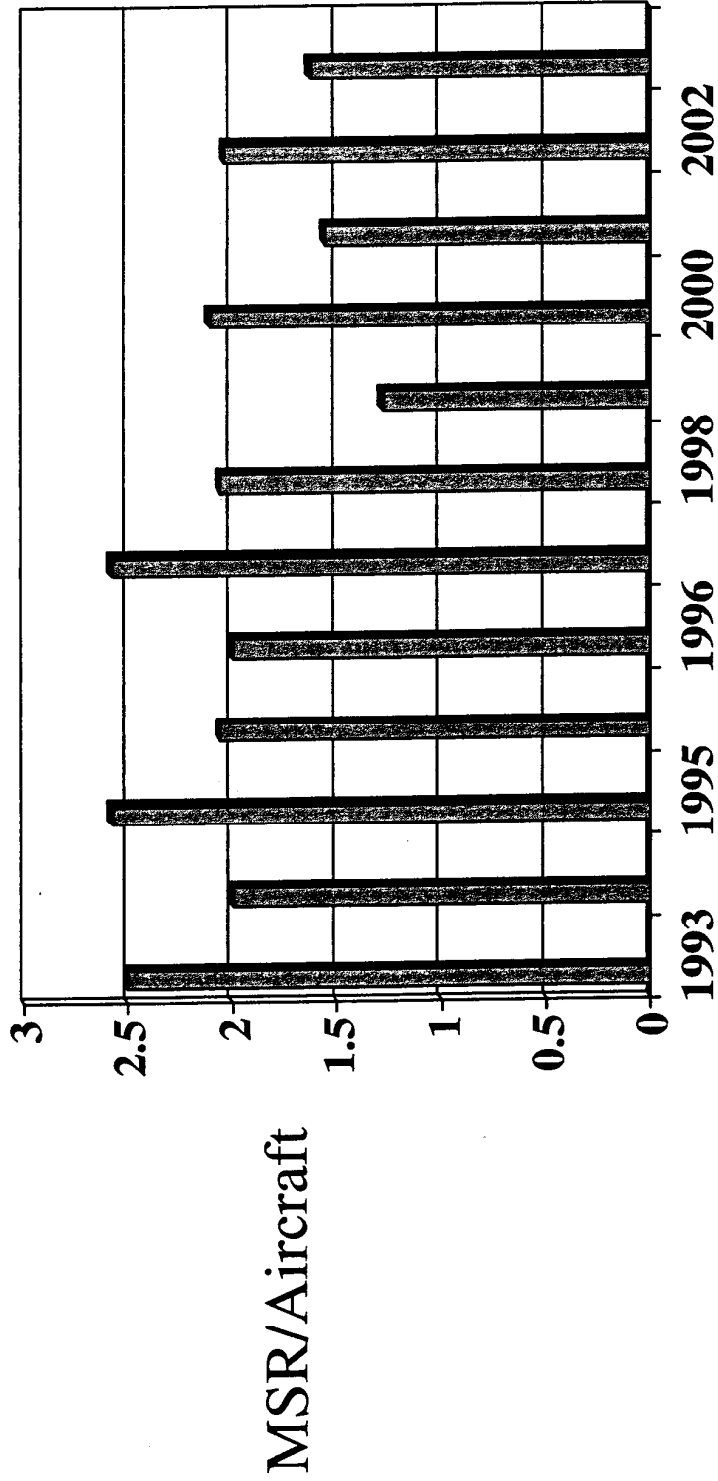
- Air Force has robust program to deal with KC-135 corrosion and ageing
  - Field level maintenance and inspection
  - 60-month (or shorter) cycle for depot maintenance
- ④ – Innovative procedures have reduced time in maintenance
- ④ – Further improvements possible (sheltering, basing rotation)

*finish near  
fixed depot  
problem.  
all are  
coming out  
at a 200 day  
period*

MSR

# Major Structural Repairs/ Aircraft in Depot\*

e.g. belly skin  
- copings  
- wings



Aircraft in Depot

\*Data from Oct 2003 USAF "KC-135 Corrosion and Service Life Report"

# USAF Estimates of KC-135 O&S Costs

- 2001 USAF Extended Service Life Study (ESLS) estimate of .9% increase per year (FY2001-FY2040)
- March, 2003 Letter from CJCS to Sen McCain states updated annual cost increase 1.5% (FY2003-FY2040)
- May, 2003 USAF Business Case Analysis (BCA) estimate of 6.5% annual cost increase (FY2003-FY2017)

*why the change 1.5% there? Depo costs, Doubled in less than 5 years*

*see slide 8. 25*

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## Differences Between ESLS and BCA

- **BCA updated ESLS cost estimate for**
  - **Phased Depot Maintenance (PDM)\***
  - **Military personnel**
  - **Modifications**
- **MilPers and Mod changes apparently unrelated to aircraft aging**
- **PDM revision is based on observed growth of 18% in weighted average unit sales price (USP) compounded annually**
  - **Most-nearly-comparable ESLS data show growth of 3.2% compounded annually in total depot maintenance costs**

# Projection Based on USP Probably Overstates Future Growth

*" won't solve problem "*

- USP is product of hours per aircraft and price per hour
- Hours per aircraft have peaked and are budgeted to remain about level
- Very recent AF projection shows price per hour peaked in FY04 and may turn down



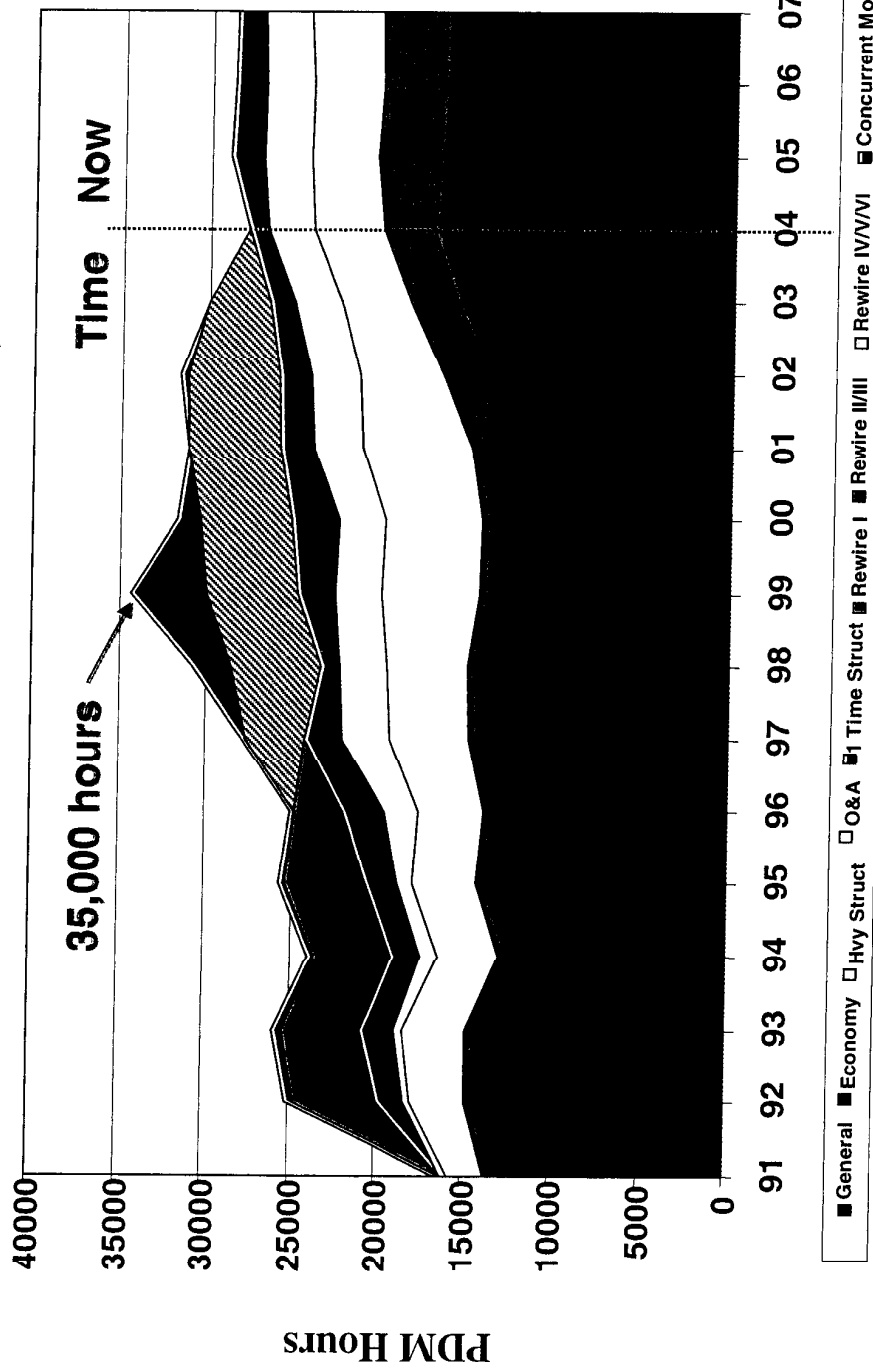
# Aircraft

## Maintenance Trends



Updated Mar 04  
**KC-135 Tanker**

### Planned Depot Maintenance (PDM) Hours



*No chgs if excluded*

As of Mar 04

*done by de  
to ord in field  
in done  
by de  
it  
is*

growth in overall O&S is  
manageable. AF figure was  
overstated (?).

# Depot Hourly Rate

FY	Sales Rate	Cost Rate
96	\$97	\$89
97	\$106	\$93
98	\$95	\$95
99	\$106	\$100
00	\$94	\$127
01	\$111	\$140
02	\$163	\$131
03	\$200	\$148
04	\$211	\$188
05	\$190	\$199

\$60.  $\frac{0.2}{\Delta}$   
 \$40  $\frac{0.7}{\Delta}$  overhead  
 \$60  $\frac{0.7}{\Delta}$  A&A costs  
 and \$20 is allowance  
 to labor  $\Delta$   
 material

extra information  
 with figures.

reflect recovery  
 costs

working capital fund prices have "noise" in data.

$\Delta$ . 7% increase, roughly over  
 18%.

# Preliminary Conclusions

- If you are willing to tolerate manageable growth in KC-135 O&S costs, you can defer major near-term recapitalization investments
- ‘But’ such a decision also pushes the block obsolescence problem to the right
- Corrosion is manageable

What is the required capability?

# Most Recent Study

- Tanker Requirements Study – 05 completed in FY01
  - Never promulgated
  - Concluded 500-600 R-equivalents adequate for 2 MTW or SIOP/1 MTW/1 SSC
  - Needs to be updated for changing tanker CONOPS
    - Potential Increases in Requirements
      - “Efficiency tanking” for loitering aircraft in kill boxes
      - The new planning scenarios
      - Homeland defense needs
    - Potential Decreases in Requirements
      - Potential re-engining of B-52’s
      - F-22/JSF CONOPS

*homeland def.*

*24/7*

*35 Coy aircraft w/ll req.*

*100 tankers*

# Two Examples

(Costs of Operations)

- 2001 DSB Task Force recommended re-engining and February 2004 DSB Task Force re-confirmed value of B-52 re-engining:

type  
→ ingress  
egress only

- 10K mile mission (US to Afghanistan and return) would only require one refueling versus two
- Fuel offload demand declines from 276K pounds to 118K pounds

- F-22/JSF capabilities may allow refueling on mission egress only

ingress or

# Tanker Tasking during OIF

(Snapshot on 27 March '03)


	Total Active Inventory	Possessed	FMC	Tasked
Total KC-10s	59	50	45	48
Total KC-135s	480	400	344	271*
Totals	539	450	389	319

\*14 of these missions were in support of homeland defense Noble Eagle

*Did not analyze whether these tankers were used because they were needed, a part of the total force.*

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# Updated Aerial Refueling Requirements

-  Mobility Capabilities Studies scheduled over next 12 months
- Unknown unknowns for aerial refueling needs in 2015-2020, e.g., role of UAVs, force structure changes, CONOPS changes

# What to do in the Near-Term?

- There is no compelling material or financial reason to initiate a replacement program prior to the completion of the AoA and the MCS → SECDEF  
Should account  
AOA to come  
7, 06FY  
Budget
- Block obsolescence of entire fleet suggests “some” recapitalization should begin in the near term (FY07?)
- Long term requirements will be resolved by MCS
- If compelled to do something now, there are several options – 767 lease/buy, re-engine the KC-135Es, convert retired commercial aircraft, encourage commercial sources for CONUS tanking, ...

# Can Refurbished KC-10's Solve a Near Term Problem?

- FEDEX has converted retired DC-10s for use as cargo carriers with 20 year life
- Northwest flying 22 DC-10s, with average cycles less than 20K
- Design Service Goal for DC-10 is 42K
- 37 large DC-10s currently in the desert with average cycles of 18.5K;

*i.e. lots of life left in NW.*

*if you  
my pod would round  
then 77.*

*10 = 67 75 - 30M / a/c*

# Refurbished KC-10's?

- Aerial refueling capability installation cost
  - IDA estimate is \$20M/airframe over rehab cost estimates
  - Combined with cost to upgrade/rehab total <sup>KC-10</sup> package would be about \$50M/airframe
- Dutch KDCC-10 tanker conversion total cost approximately \$45M each
- One KC-10 is the equivalent of 2.4 KC-135Es; replace the 63 remaining KC-135Es with 25 refurbished KC-10s?

# Potential Hybrid Recap Program

- Retire 61 KC-135Es in near term (USAF plan) and make available to commercial entities for use as commercial tankers for CONUS missions such as training and homeland defense
- Phase out remaining 63 KC-135Es by FY11 and replacing with converted KC-10s by leveraging the stored DC-10s and the Northwest fleet

# Potential Hybrid Recap Program (Cont'd)

- Work with major airframe manufacturers to develop new tanker options with more modern airframes versus the 20 year old 767 design

# Conclusions

- Air Force Tanker Force is an essential element of our ability to project power
- Corrosion can be controlled
- KC-135 O&S growth is not as large as once projected
- Total requirement is uncertain (but clearly in the hundreds); MCS to resolve
- There is a need to embark on a major tanker recap program upon the completion of the AOA and the Mobility Capabilities Study (MCS)
  - Doesn't necessarily mean new aircraft