AERIAL REFUELING
DSB TASK FORCE

Aerial Refueling DSB Task Force

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
TOTAL	588	547	539	539	539	539	539	539

- Funding in FY05 President's Budget Request

($M)	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	TOTALS
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?

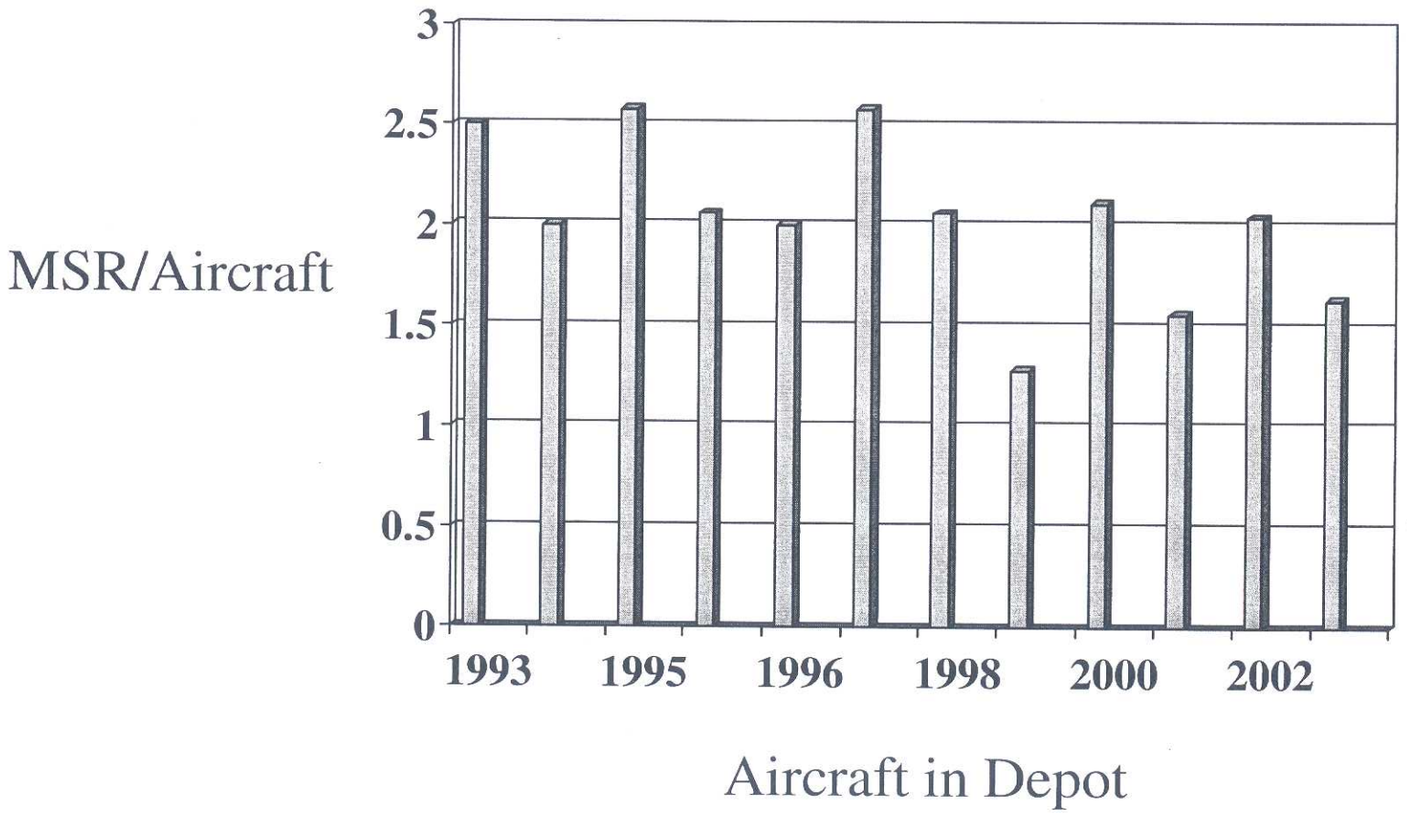
DSB Corrosion Findings

- Air Force has a robust corrosion control program
- 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
- Depot Major Structural Repairs (MSRs) appear to be decreasing
- 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
  - Innovative procedures have reduced time in maintenance
  - Further improvements possible (sheltering, basing rotation)

Major Structural Repairs/ 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)

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

- 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

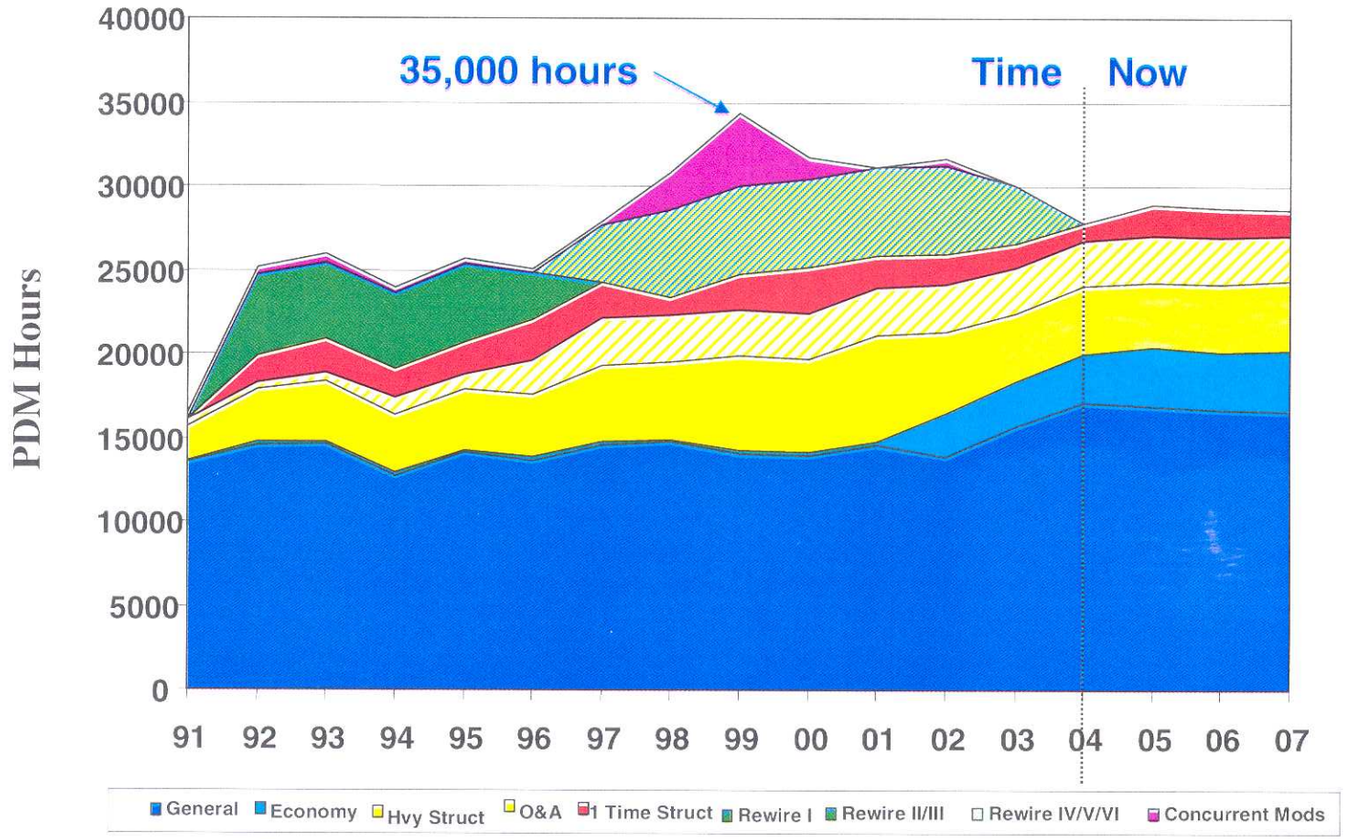
Aircraft

Maintenance Trends

Updated Mar 04

KC-135 Tanker

Planned Depot Maintenance (PDM) Hours



As of Mar 04

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

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

Two Examples

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

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

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
- 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;

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 package would be about $50M/airframe
- Dutch KDC-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