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The Air Force KC-767 Lease Proposal: Key Issues For Congress

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Summary

The Air Force wishes to replace its KC-135E aircraft by leasing 100 new Boeing KC-767 tankers. The Air Force indicates that leasing is preferred because it will result in faster deliveries than outright purchasing. Air Force leaders argue that a lease will allow them to husband scarce procurement dollars by making a small down payment. Although Congress authorized the proposed lease in the FY2002 DOD Appropriations Act, it stipulated that the defense oversight committees must approve the lease – only the Senate Armed Services Committee has yet to approve. The lease proposal has been controversial and issues raised thus far include:

Whether there is an urgent need to replace the KC-135 fleet. The Air Force states that replacing the KC-135 is urgent, citing high costs, aircraft vulnerability to catastrophic problems, and the imminent closing of the 767 production line. Opponents of the lease state that operating costs are controllable and will be far lower than the overall costs of leasing the 767; that the vulnerability is no more than depicted in a 2-year old study which the Air Force found acceptable; and that the 767 production line is viable until 2006-2008.

Whether the KC-767 is the right airplane. If acquired, the KC-767 may be in DOD's inventory for 50 years. The Air Force says that the KC-767 is much more capable than the KC-135. Opponents say that other aircraft are even better than the KC-767 in meeting the Air Force's requirements. The Air Force opposes re-engining KC-135Es, but opponents say it merits attention, as does outsourcing aerial refueling.

Whether the Air Force cost comparison is authoritative. The Air Force's report to Congress calculates that a 767 lease would cost $150 million more than a purchase on a net present value basis. This calculation, however, is sensitive to many assumptions. CRS analysis shows that several assumptions built into the calculation, if treated differently than in the Air Force report, could change the calculation by hundreds of millions of dollars each. Although some could change the calculation to favor either the lease or the purchase, others – such as the discount rate used to calculate net present value and whether to use multi-year procurement for the purchase option – could be more likely to alter the comparison more in favor of the purchase option.

Whether this lease has implications for congressional budget oversight. The proposed lease appears to be an unprecedented method of funding a major new defense procurement. Critics point out that this approach is coupled with exemptions from longstanding laws on budgeting and defense procurement. The proposed lease raises policy issues regarding the visibility of full costs for DoD programs in the congressional oversight process, including questions concerning locking in budgetary resources when costs are uncertain, appropriateness of using an operating lease for this proposal, the impact of a Special Purpose Entity, and the potential for deviation from full-funding of the government's contractual liability.

This report will not be updated.

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Introduction and Background[1]

Introduction

The Air Force is proposing to replace 133 of its oldest Boeing KC-135E aerial refueling tanker aircraft by leasing 100 new Boeing KC-767 tankers instead of initially buying them outright.[2] The proposed lease was authorized by Section 8159 of the FY2002 DOD Appropriations Act (P.L. 107-117 of January 10, 2002). The lease, if implemented, would represent a significant shift away from previous Air Force plans to modernize its tanker fleet, and a significant departure from normal DOD procedures for major DOD aircraft acquisition programs.

The main issue for Congress is whether to approve or disapprove the lease. Congress's decision on this lease could significantly affect DOD aerial refueling capabilities, Air Force funding requirements, and the U.S. defense industrial base. Congress's decision could also set precedents for DOD acquisition practices and have significant implications for future oversight of DOD acquisition programs.

This report examines the lease proposal and its ramifications by providing background information on the Air Force's tanker fleet, the Boeing 767 tanker, and the proposed lease itself. Then the report analyzes the following potential oversight issues for Congress relating to the merits of the proposed lease:

- Is there an urgent need to replace the oldest KC-135s?
- If so, is the KC-767 the best replacement aircraft?
- Are there industrial base concerns?
- How the does cost of acquiring 100 KC-767 tankers through a lease compare to the cost of acquiring them through a purchase (i.e., a procurement)?
- What potential implications might implementing the lease have for congressional oversight of DOD acquisition programs?

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[1] This section is by Christopher Bolkcom and Ronald O'Rourke; Specialists in National Defense; Foreign Affairs, Defense, and Trade Division.

[2] See CRS Report RS20941, *Air Force Aerial Refueling: Lease, Buy, or Other?* by Christopher Bolkcom, for a short introductory overview of the subject.

Although the discussions of these four questions are written so that the reader can proceed from one discussion to the next, the discussions are designed to be fairly self-contained, so that readers who might be interested in only a particular question can read the section on that question.

Background

Air Force's Draft Tanker Roadmap. The Air Force's tanker fleet currently consists of 544 aging KC-135E tankers and 59 somewhat newer KC-10 tankers. The Air Force's draft Tanker Roadmap of June 18, 2003 – its draft plan for managing and modernizing the tanker fleet – proposes to begin recapitalizing (i.e., replacing) the fleet by leasing 100 new Boeing 767 aircraft that have been converted into tankers. The leased 767 tankers would be used to replace tanker capability now provided by the 133 oldest KC-135Es in the fleet. The lease on the first group of 767s would begin in late FY2006.

The draft roadmap also calls for retiring 58 KC-135s in FY2004-FY2005 and another 68 in FY2006-FY2008, and using the resulting savings to help finance the lease. A third component of the draft roadmap calls for conducting a new tanker requirements study and an analysis of alternatives (AOA) to determine future requirements for the tanker fleet and the tanker characteristics best suited to replace the remaining aircraft in the tanker fleet.

The June 18, 2003 draft roadmap appears to depart from long-standing Air Force plans for the tanker fleet, which called for conducting an AOA prior to acquiring any new tanker aircraft, and for beginning recapitalization in the 2012 time frame rather than in FY2006.[3] The most recent tanker requirements study found that by the year 2005, the Air Force would need 500 to 600 KC-135R tankers – or their equivalent – to meet the tanker needs of the national military strategy. The Air Force study concluded that the current tanker fleet cannot satisfy this requirement because a portion of the fleet is always in maintenance and is therefore not operational.

KC-135 Cost and Availability – The Economic Service Life Study (ESLS). The Air Force's most comprehensive study of the KC-135 fleet is the *KC-135 Economic Service Life Study* (February 2001), which serves as the most appropriate baseline, and point of departure for considering the urgency of KC-135 recapitalization. The Economic Service Life Study (ESLS) made cost and availability forecasts for the KC-135 fleet for the years 2001 through 2040. It was conducted by a team of experts from throughout the Air Force and led by the Air Mobility Command (AMC). Regarding cost, the ESLS found that the KC-135 fleet would incur "significant cost increases" between 2001 and 2040, but "no economic crisis is on the horizon", "there appears to be no run-away cost-growth," and "the fleet is structurally viable to 2040." (See Figure 1) Following the ESLS publication, the Air Force planned to wait until 2013 to begin KC-135 replacement.

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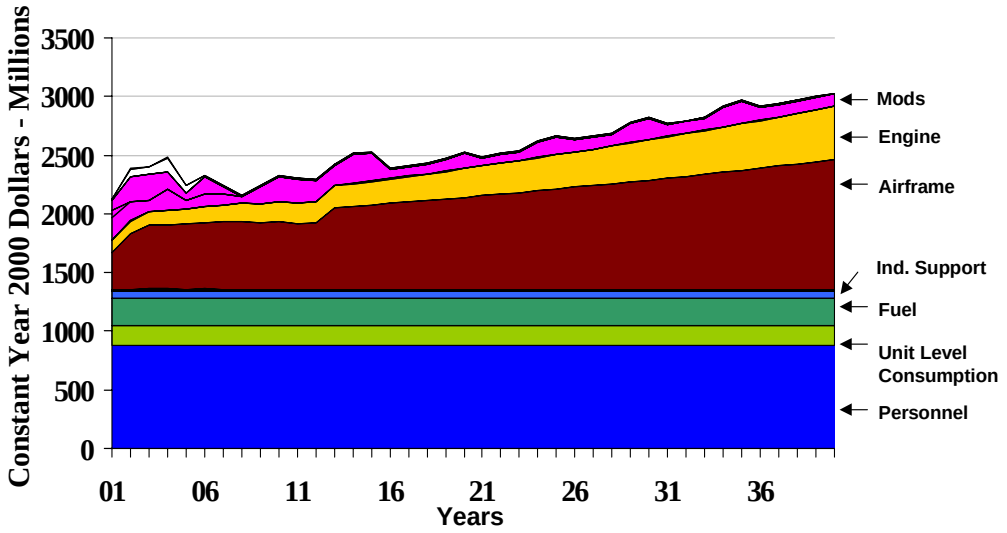
[3]See Guy Norris, "USAF Begins New Tanker Search," *Flight International*, November 21, 2000, p. 21.

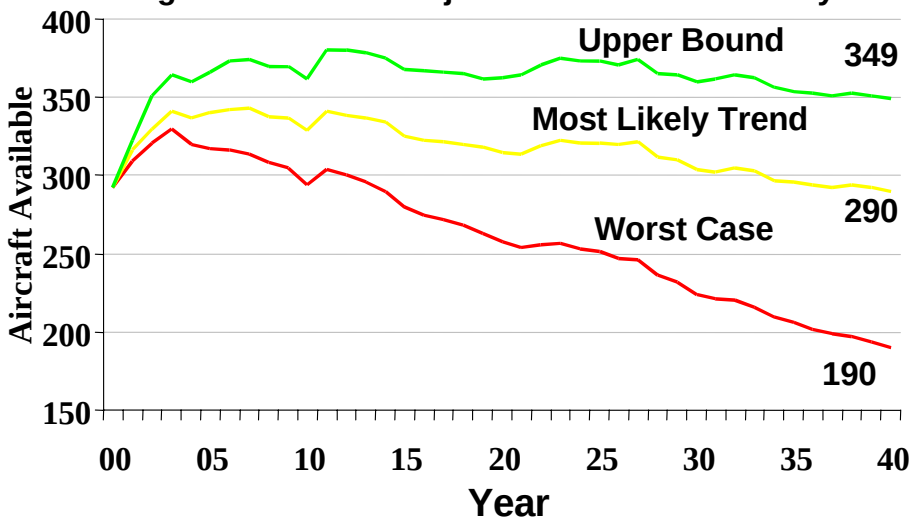
Figure 1. KC-135 Annual Cost Forecast



Adapted from: *KC-135 Economic Service Life Study. Tanker Requirements Study for FY05*. HQ AMX/XPY

Regarding aircraft availability, the ESLS predicted that the number of KC-135s available would increase between FY01 to FY04, reflecting improvements made in programmed depot maintenance, but would then decline gradually until 2040. (See Figure 2.) The ESLS projected three potential trends: the most optimistic trend ("Upper Bound") showed between 350 and 375 KC-135s being available from 2005 to 2039, and ending at 349 aircraft available in 2040. The "most likely" trend showed between 300 and 350 aircraft being available between 2005 and 2035, with aircraft dipping below 300 and ending around 290 available in 2040. The "worst case" trend (assumed that the Air Force did nothing to try to arrest the declining trend in availability) showed aircraft availability gradually and consistently declining from a high point of approximately 330 in 2004 to only 190 in 2040. The ESLS predicted that the actual future trend would be somewhere between the upper bound (349) and the most likely trend (290).

Figure 2. KC-135 Projected Aircraft Availability



Source: *KC-135 Economic Service Life Study. Tanker Requirements Study for FY05*. HQ AMC/XPY

The Tanker Version Of The Boeing 767. The Boeing 767 has been in production since the early 1980s. Of the more than 900 that have been built, most are used in commercial aviation as airliners or cargo carriers. Military applications for the 767, however, have been envisioned and pursued for at least 10 years.

As early as July 1992, Boeing began publicly exploring the idea of using the 767–200ER version of the 767 design[4] as the successor for a variety of existing combat-support Air Force aircraft that are based on the old Boeing 707 aircraft design.[5] Among the Air Force missions mentioned as being suitable for the 767-200ER were airborne early warning, aerial refueling, and electronic reconnaissance and surveillance. In 1993, Saudi Arabia began exploring the potential purchase of new or used 767s or other commercial aircraft for use as military tankers. Since then, Australia, Italy, Japan, Singapore, and the United Kingdom have studied the use of used or new commercial aircraft, including 767s, as tankers to replace their older tanker aircraft.

In March 2000, Boeing created a business unit to market the 767 tanker worldwide. In April 2000, Boeing signed a contract to build four new 767 military tankers for Italy, with the first to be delivered in 2005. This was followed by a second contract to build four new 767 military tankers for Japan.

In February 2001, Boeing offered to sell thirty six 767 tankers to the Air Force as a stop-gap measure for bolstering Air Force tanker capability pending the results of the Air Force's projected tanker AOA. At a June 6, 2001, hearing before the

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[4]767-200ER means the extended-range variant of the 200-series version of the basic 767 design.

[5]"Boeing Sees 767 as Heir to 707 in AWACS, Tanking, Other Missions,"*Aerospace Daily*. July 14, 1992. P.78.

defense subcommittee of the Senate Appropriations Committee, General Michael Ryan, then-Chief of Staff of the Air Force, mentioned the Boeing offer in his response to a question from Senator Ted Stevens on the continued viability of the service's KC-135s. General Ryan stated that "we're looking out in about the next 15-year time frame to begin that replacement."[6]

A September 25, 2001, press report stated that Representative Norman Dicks, a member of the defense subcommittee of the House Appropriations Committee, planned to "insert an amendment into a defense appropriations bill to jump-start the Air Force's purchase of hundreds of Boeing 767 tankers and electronic surveillance planes."[7] In an October 12, 2001 interview, Air Force Secretary James Roche expressed support for leasing 100 767s and explained the Air Force's rationale for the proposal:

> We have a unique business opportunity to get the best pricing possible to address our critical need for a multimission aircraft that can carry gas and also do all kinds of other things. ... This is not a bail out, but taking advantage of a buyer's market.[8]

The Proposed 767 Tanker Lease.

Basic Elements of the Lease . Under the proposed 767 lease, the Air Force would lease each of the 100 767s for a period of 6 years. The 100 aircraft would be leased in 6 groups. The lease for the first group of four aircraft would begin in late FY2006 and extend to late FY2012. The lease for the next group of 16 aircraft would begin at the start of FY2007 and extend to the end of FY2012. The remaining 80 aircraft would be divided into 4 groups of 20 whose leases would begin at the start of FY2008, FY2009, FY2010, and FY2011, respectively, and extend to the end of FY2014, FY2015, FY2016, and FY2017, respectively. Figure 3 below illustrates the relationship between the annual lease payments, the total lease program costs and the number of aircraft under lease.

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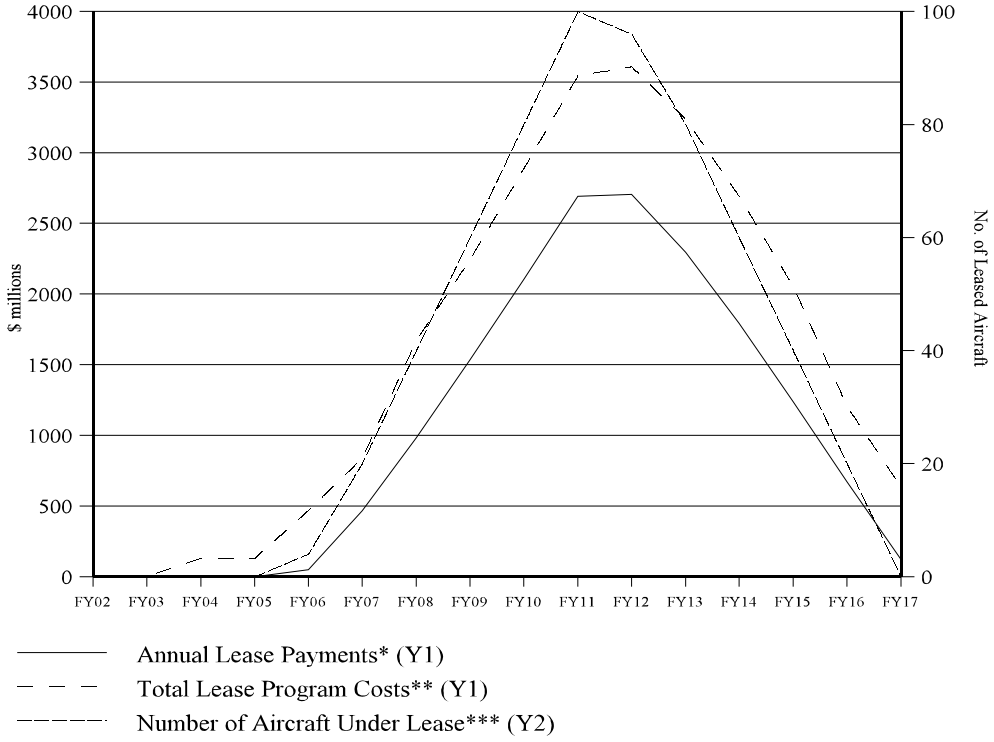
[6]Hearing of the Senate Appropriations Committee Subcommittee on Defense, June 6, 2001.

[7]The Air Force remained reserved. An Air Force spokesman, Capt. Joe Della Vedova, was quoted as stating, "We believe the 767 could be converted and would be a suitable candidate for conversion." See Katherine Pfleger, "Lawmakers Consider Air Force as Boeing Commercial-Plane Customer," *Associated Press Newswires*, September 30, 2001.

[8]Vago Muradian, "Roche Seeks Speedy 767 Deal With Boeing to Renew Support Fleet at Low Cost," *Defense Daily International*, October 12, 2001.

Figure 3. Cost of Lease Payments and Total Lease Program, FY2003-FY2017



Notes: Y1=left axis, $ millions Y2=right axis, number of leased aircraft
* Lease payments reflect the number of aircraft that have been delivered. Each set of aircraft is available for a six-year lease from the time of delivery.
** Total Lease program cost includes annual lease payments and all support costs but not purchase of aircraft. If the at the end of the leases, Air Force purchases all 100 aircraft, the total program cost would be $29.8 billion U.S., or about $5.2 billion more. If the Air Force does not buy the aircraft, Wilmington Trust would sell the aircraft to pay off the bondholders. If the Air Force sells the planes for more than needed to pay off bondholders, the Air Force would receive a rebate, estimated at $800 million.
*** Under the Air Force plan, aircraft would be delivered between 2006 and 2011 on the following schedule: 4, 16, 20, 20, 20, 20. Since each aircraft is to be leased for a six-year period, the number of aircraft leased grows to 100 by FY2011 when all aircraft are delivered and then declines to zero once all leases are completed. To continue to lease the full fleet of new aircraft, the Air Force would need to begin buying the planes starting in 2012.
Source: CRS calculations based on Air Force, *Business Case Analysis Model*, "Lease/Return Option," July 1, 2003.

Boeing would begin building each group of aircraft 3 years prior to the start of the lease for each group. To finance the 3-year construction effort for each group of aircraft, Boeing would draw down on a bank line of credit (i.e., a bank loan). Upon completing construction of each group of aircraft, Boeing would sell the aircraft to a special non-profit entity established specifically for the 767 lease. This entity, referred to as a Special Purpose Entity (SPE) or Variable Interest Entity (VIE) and named the Wilmington Trust, would in effect act as a middleman between Boeing

and the Air Force. The SPE would purchase the 767s from Boeing using funds that the SPE would raise by issuing bonds on the commercial bond market (i.e., funds that private investors would agree to loan to the SPE in exchange for a promise from the SPE to eventually repay those funds with a certain amount of interest). The SPE would then lease the 767s to the Air Force using lease payments that are calculated to cover (but not exceed) the SPE's costs, which would include the purchase cost of the 767s (an average of $138.4 million per plane, including $7.4 million in interest costs on Boeing's construction loans), the interest return promised to the bondholders, and the SPE's minor administrative expenses.

The SPE plans to offer three tranches of bonds, each secured by different assets and each reflecting different risks. The "G" tranche, estimated to make up about one-third of the total lease cost, will be secured by the Air Force's lease payments. Because the Air Force is contractually liable for an additional year's worth of lease payments in case of termination, these are essentially low-risk bonds. For that reason, the Air Force is projecting that rates will be about 1/2% point above the projected Treasury bill rates from 2006 to 2011.[9]

The second tranche of bonds, the "A" bonds, covering about half of the borrowing, would be secured by the value of the aircraft itself and would be the second claimant in case of termination. The Air Force is projecting that those bonds would also be relatively low risk, and hence, would require an interest rate 1% above the projected Treasury rate in each year from 2006 to 2011. Although it could well be difficult to sell the aircraft for their full value, some would argue that the likelihood that the Air Force would renege would be low because under the contract, they would face large, unbudgeted termination liabilities that could be as high as $2.7 billion at the highpoint of lease payments. In addition, the Air Force sees a compelling need to maintain the size of the tanker fleet.

The third tranche of bonds, the "B" bonds, to cover about 15% of the total cost of the lease, would be backed by the potential sale of the aircraft to the Air Force at the end of the lease. This tranche of bonds is a more risky proposition because a purchase requires Congressional approval, and an additional $4.4 billion in funding. However, purchase is an attractive option because the Air Force would already have paid 90% of the cost of the aircraft in its lease payments. Additionally, the aircraft would only have been used for one-quarter or less of their normal service lives.[10] To reflect potential risks, the Air Force projects that a 10% interest rate compounded to the end of each lease would be required to attract bondholders.[11]

A principal purpose of the SPE is to relieve Boeing of the need to lease the 767s directly to the Air Force. If Boeing were to lease the 767s directly to the Air Force,

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[9]Description of the three tranches is based on discussions with and briefings from the Air Force.

[10]Each aircraft would have been used for six years, less than one-quarter of the aircraft's 25 year service life. In addition, the Air Force is planning to fly the planes for about 750 hours a year, about one-quarter of typical commercial usage rates.

[11]Discussion above based on Air Force briefing to CRS, "KC-767A Report to Congress, Status Brief", July 15, 2003, and Boeing briefing, "USAF KC-767A Tanker," July 24, 2004.

Boeing would have to retain ownership of the 767s and would pay off its construction loans gradually, using proceeds from the lease payments. This would require Boeing to carry a significant amount of construction-related debt for an extended period of time, which might significantly weaken Boeing's financial condition.

Upon the conclusion of the 6-year lease period for each group of 767s, the Air Force would have the option of either returning the 767s to the SPE or purchasing the 767s for an additional payment of $44 million per plane.

Enabling Legislation and Report Language. The authority for the Air Force to lease 100 767 tankers (and also 4 Boeing 737 transport aircraft) was provided in the following legislation:

- Section 8159 of the FY2002 defense appropriations act (P.L. 107-117 of January 10, 2002);
- Section 133 of the FY2003 defense authorization act (P.L. 107-314 of December 2, 2002);
- Section 8117 of the FY2003 defense appropriations act (P.L. 107-248 of October 23, 2002); and
- additional report language in the conference report on P.L. 107-248 (pages 206-207 of H.Rept. 107-732 of October 9, 2002) on a matter other than what is covered in Section 8117.

Together, these provisions provide authority for a lease that departs from normal procedures for major DOD acquisition programs by:

- specifying the acquisition method to be used (i.e., an operating lease rather than a capital lease or a procurement);
- specifying the number and type of aircraft to be leased (100 Boeing 767s and 4 Boeing 737s);
- exempting the lease from requirements and limitations that normally govern DOD leases of ships and aircraft which are established in 10 USC 2401 and 2401a;
- exempting the lease from a limit established in 31 USC 1553(b)(2) on the amount of appropriations that, under certain circumstances, may be charged to closed-out appropriation accounts;
- exempting the Air Force from the "Buy American" requirements of the Berry Amendment (10 USC 2533a);
- establishing a special congressional approval process for the lease.

It should also be noted, however, that Section 8159 is not the first provision permitting DOD to lease aircraft. The FY2000 Defense Appropriations Act (P.L. 106-79 enacted on October 25, 1999) contained a provision (Section 8133) somewhat similar to section 8159 that permitted the Air Force to lease six aircraft "for operational support purposes, including transportation of the combatant Commanders in Chief," (i.e., the top U.S. officers in charge of U.S. military forces operating in various regions of the world).

Section 133 of the FY2003 defense authorization act (P.L. 107-314 of December 2, 2002) states that the Air Force may not enter into a lease for the acquisition of tanker aircraft under Section 8159 of P.L. 107-117 until authorization and appropriation of funds necessary to enter into the lease are provided by law *or* until DOD submits to Congress a new start programming notification for the lease in accordance with established procedures for such notifications.

Status of Congressional Approval Process. Section 8159 of P.L. 107-117 states that the Air Force may not enter into the lease until it submits a report to the congressional defense committees – the House and Senate Armed Services committees and the House and Senate Appropriations committees – on its plans for implementing the lease and until a period of not less than 30 calendar days has elapsed after submitting the report. The practical effect of this provision is to prevent the lease from being implemented until the four congressional defense committees have signaled their approval of the lease.

On July 10, 2003, the Air Force submitted the report required by Section 8159 of P.L. 107-117 to the four defense oversight committees. The 7-page report (plus a 1-page summary and 4 pages of appendices listing specific lease terms and conditions) discusses the operational requirement for tankers, alternative tanker-force investment options, the estimated costs of leasing and procuring the 767s, the Air Force's plan for implementing the lease, and basing plans for the 767s.

Following the July 10th report, the Air Force submitted a new start reprogramming notification for 767 lease mentioned in Section 133 of P.L. 107-314. Through late August 2003, 3 of the 4 congressional defense committees had approved the KC-767 new start reprogramming. The Senate Armed Services Committee has not yet signaled its approval or disapproval. Both the Senate Armed Services Committee and the Senate Commerce Committee have scheduled hearings for early September 2003.

Issues for Congress

For congressional policymakers, the merits of the decision to approve or disapprove the KC-767 lease relate in part to examining the following questions:

- Is there an urgent need to replace the oldest KC-135s?
- Is the KC-767 the best aircraft for the job?
- What are the industrial base concerns?
- Given the uncertainties involved in this unusual acquisition mechanism, are the costs projected by the Air Force the most authoritative?
- What potential long term implications does this lease present in terms of budget and congressional oversight?

Is There an Urgent Need to Replace the KC-135?[12]

Much of the Air Force's argument for leasing 100 KC-767s is based on its assessment that it has an urgent need to replace the oldest KC-135s: that operations and support costs are too high, that mission availability is too low, that the aircraft is wearing out prematurely due to high operations tempo, and that it is vulnerable to catastrophic problems.[13] The Air Force argues that leasing the KC-767 will result in faster deliveries – under the Air Force's self-imposed funding limits - than will purchasing them, which may be important if the need to recapitalize is urgent.

A key judgement for policy makers is whether the need to replace the KC-135E fleet is urgent enough to justify the leasing procedure. If the need is urgent, then the higher costs of leasing rather than purchasing new aircraft may be justified. If the need is not so urgent, then it may be more prudent to delay any action on new aircraft. In this case, critics of the lease point out that an analysis of alternatives (AOA) could be performed over the next few years to more accurately determine what joint aerial refueling requirements may be, prior to embarking on tanker recapitalization.

Recently, Air Force officials have argued that a number of the ESLS findings that could be interpreted as supporting a more gradual approach to tanker

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[12]This section written by Christopher Bolkcom. Specialist in National Defense, Foreign Affairs, Defense, and Trade Division.

[13]"Report to the Congressional Defense Committees on KC-767A Air Refueling Aircraft Muliti-Year Lease Pilot Program." Secretary of the Air Force. July 10, 2002. "...the urgent need to begin recapitalization.." Dr. Marvin Sambur, Assistant Secretary of the Air force told the House Armed Services July 23, 2003: "We urgently need to recapitalize now." Mr. Neil Curtin, General Accounting Office: "the Air Force does not make the case that leasing is cheaper. Instead, the real main argument for the proposal is that there's an urgent need to begin replacing the current tanker fleet."

recapitalization no longer appear accurate or valid. In congressional testimony, official statements, and numerous press interviews Air Force officials have offered four general arguments for why replacing the oldest KC-135E models with new aircraft is urgent:

- New data and analysis show that KC-135 O&S costs will rise faster than the ESLS predicted;
- KC-135s mission capable rates (MCR) are too low, they spend too much time being repaired and maintained in depot, and are thus too frequently unavailable to the warfighter;
- The KC-135 is vulnerable to catastrophic problems that could cause the entire fleet to be grounded;
- Tanker requirements, and assumptions about KC-135 usage rates, were formed prior to the terrorist attacks of September 11, 2001. Usage rates have, and tanker requirements likely will, increase in the new security environment.

Each of these issues will be addressed in the sections below.

New Findings on KC-135 Costs. Air Force and DOD officials argue that recent estimates of KC-135 costs have been higher, and future costs will also be higher than the ESLS projected. They say that the ESLS study was "extremely optimistic,"[14] especially in its assumptions and projections on key operation and support (O&S) cost drivers. For example, depot labor rates have increased much more quickly than anticipated: from $111 per hour in 2001 to $160 per hour in 2002, and $210 per hour forecast for 2003. The cost of repairing the engine struts on the KC-135Es increased from $1 million per aircraft in 2001 to $3 million per aircraft in 2002.[15]

The effect of the optimistic projections contained in the ESLS study becomes evident, DOD officials argue, by comparing ESLS projected 2001 costs to actual 2001 costs. While the ESLS projected 2001 O&S costs to be $2.1 billion, the Air Force actually spent $2.26 billion, an increase over ESLS estimates by $250 million or 11.9 percent. Revised Air Force projections now assume that the annual KC-135 O&S costs will escalate from $2.26 billion to $3.4 billion in 2040.[16] While the ESLS predicted 1 percent real cost growth per year and 43 percent cumulative real cost

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[14] Major General Paul W. Essex, Director, Plans and Programs, HQ Air Mobility Command. "U.S. Representative Duncan Hunter Holds Hearing on Air Force Tanker Lease Program." July 23, 2003 FDCH Political Transcripts. Washington, DC.

[15] *USAF Need for KC-135 Recapitalization: Operational, Maintenance & Economic Implications*. A September 2002 Reassessment of the KC-135 Economic Service Life Study. U.S. Air Force.

[16] Correspondence from General Richard B. Myers. Chairman of the Joint Chiefs of Staff. to Senator John McCain. March 13, 2003.

growth by 2040, the new estimates predict 1.5 percent real cost growth per year and 64 percent cumulative cost growth by 2040.[17]

Many of those opposed[18] to the KC-767 lease do not dispute the higher O&S costs incurred in 2001. Instead, they take issue with the assertion that costs will continue to rise at the same rate. One year of increased costs, opponents say, does not amount to a 39 year trend. The Air Force appears to be making a linear extrapolation from 2001 to 2040. The $3.4 billion figure for 2040 costs is derived by assuming that costs will continue to increase by 1.5 percent for the next 39 years rather than the ESLS one percent estimate. The Air Force has provided no analysis or proof that the increased costs incurred in 2001 aren't a one-time anomaly, opponents argue, and thus, the ESLS cost projections to 2040 are still the most authoritative. The increased costs for 2001, lease opponents argue, are likely caused by the considerable efforts the Air Force made to "fix the KC-135 depot" (see availability section below) and now that the depot is running well, it is not a given that costs will continue to increase at the same rate.

Those opposed to the KC-767 lease also take issue with the Air Force claim that the ESLS study was optimistic. On the contrary, they say, the ESLS took a conservative approach in its projections of future KC-135 costs. For example, the ESLS airframe cost estimates (the largest cost drivers in Figure 1 above) are made up of programmed depot maintenance, major structural repairs, and structural investments. The ESLS identified two structural investments that were needed – KC-135E struts, $1 million per aircraft, and topcoat removal, $500,000 per aircraft. Recognizing the uncertainty of predicting future repairs, the ESLS estimates included $6 million per aircraft of notional repairs that may not, in fact, ever be needed: upper wing skins ($2 million per aircraft), fuselage skins ($2 million per aircraft), and unknown structures ($2 million per aircraft.) Also, while some costs (notably programmed depot maintenance, or PDM) have gone up, others have gone down, or have been eliminated. Depot engineers, for example, have learned how to save $500,000 per aircraft by conducting periodic inspections and maintenance instead of removing flaking topcoat (a corrosion preventative material).

Air Force officials state that they have, in fact, gone beyond a linear extrapolation of 2001 KC-135 O&S costs and conducted a recent analysis of future costs.[19] In this May 1, 2003 study, the Air Force re-evaluated ESLS projections. The Air Force accepted all ESLS assumptions and data except for PDM estimates, aircraft modifications and military personnel estimates. By updating these data, and by using more sophisticated analytical tools, such as compound growth modeling and

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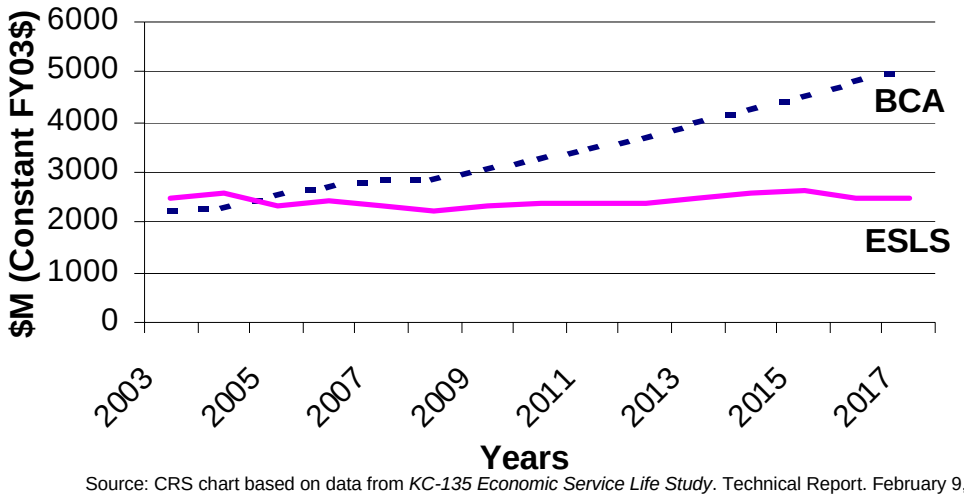
[17] *USAF Need for KC-135 Recapitalization: Operational, Maintenance & Economic Implications*. A September 2002 Reassessment of the KC-135 Economic Service Life Study, U.S. Air Force.

[18] Several members of Congress have expressed their opposition to the lease, as have academics in newspaper OP-EDs, and a number of not-for-profit organizations, such as National Taxpayers Union, Council for Livable World, Citizens Against Government Waste, National Taxpayers Union, National Law and Policy Center, Project on Government Oversight have voiced their opposition..

[19] *KC-135 Business Case Analysis*. Headquarters, USAF. May 1, 2003.

discounting ESLS constant-year dollars (CY) into net present-value (PV) dollars, the Air Force projected KC-135 O&S costs to the year 2017 and believes they will be considerably higher than the ESLS projected two years ago. Figure 4 illustrates the new projections compared to ESLS projections.[20]

Figure 4. KC-135 Cost Projections from 2001 (ESLS) and 2003 (BCA)



Source: CRS chart based on data from *KC-135 Economic Service Life Study*. Technical Report. February 9, 2001. P.21, and *KC-135 Business Case Analysis*. HQUSAF. May 1, 2003. ESLS data inflated from original Constant FY00$ to to Constant FY03$ using USAF 3400 (Operations & Maintenance) inflation rate of 1.034)

This new analysis, Air Force officials argue, suggests that KC-136 O&S costs are not just higher today than previously anticipated, but will also likely continue to exceed projections. These newer, and higher cost estimates, the Air Force says, support their argument that re-capitalizing the KC-135 fleet sooner rather than later makes good economic sense.

As a recent study, the Air Force's most recent projection of future KC-135 costs has not yet been widely disseminated, and thus, reaction to it has been minimal. Lease opponents could express dissatisfaction with the newer cost projections on at least two levels. First, opponents could argue that the Air Force does not fully explain its rationale for the changes it made in ESLS assumptions and data, and the effect that these new data have on future cost projections. What changes were made in the original ESLS projections on military personnel, for example, and what percentage of the newer, higher cost estimates are attributed to this change? The new study provides no explanation or rationale. Second, opponents could argue that the fact that the Air Force has performed two different studies in such a short time period that produce such different outcomes calls into question the credibility of those findings. What confidence can readers have in the new projections, opponents could

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[20] CRS produced this chart based on data from the two studies. For simplicity of presentation, and to make an "apples-to-apples" comparison, the data are presented in constant year dollars. The 2003 KC-135 Business Case Analysis provides data in constant year, then year (TY) and net present-value dollars, but plots the TY dollars only.

argue, when just two years ago, the Air Force presented the ESLS as the definitive study?

KC-135 Mission Availability. Air Force officials argue that as aircraft age, the oldest KC-135's mission capable rates (MCR) will decline, and that the aircraft spends too much time in maintenance depots. These two factors will combine to reduce the number of available aircraft to unacceptably low levels. The Air Force needs, they argue, to recapitalize the KC-135 fleet with new aircraft that will satisfy mission availability requirements.

The Air Force has a goal of an 85 percent mission capable rate (MCR) for tanker aircraft. The MCR is the percent of time that an aircraft is available to perform its assigned mission. Making judgements on the adequacy of KC-135 MCR is complicated because the MCR appears highly dependent on the time period considered and whether the aircraft is in the active or reserve component.

Air Force officials have testified that over the last five years, KC-135Rs have averaged a 78 percent MCR and the KC-135Es a 71.9 percent MCR, well below the 85 percent goal.[21] This testimony appears to roughly correlate with a 2002 Air Force study that showed active duty KC-135Rs with an MCR above 80 percent for FY1997, 1998, 1999, 2001 and 2002. The active duty "R" models MCR's fell slightly below 80 percent in 2000. KC-135Rs in the reserve fleet had generally higher MCRs than KC-135Es, which fluctuated between the low 60s and high 70s. The 2002 study, also states, however, that "Mission capable rates are holding steady" which appears to contradict some KC-767 lease proponents' assertions that the MCR is getting worse.[22]

The General Accounting Office (GAO) has also written that the KC-135 rates are holding steady – "...there has been no indication that mission capable rates are falling or that the aircraft cannot be operated safely."[23] Also, the GAO asserts "KC-135s in the active duty forces are generally meeting the 85-percent goals for mission capable rates."[24] Moreover, a January 2003 Air Force study also shows the MCR for

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[21]Major General Paul W. Essex, Director, Plans and Programs, HQ Air Mobility Command. "U.S. Representative Duncan Hunter Holds Hearing on Air Force Tanker Lease Program." July 23, 2003 FDCH Political Transcripts. Washington, DC.

[22]*KC-135 Tanker Aging Aircraft Story*. General Handy, CINCTRANSCOM. General Lyles, Commander AFMC. August 2, 2002. The MCR data in this briefing were expressed in bar-chart format, so the exact data was unavailable. Estimates are based on visual inference of the chart.

[23]"Military Aircraft: Considerations in Reviewing the Air Force Proposal to Lease Aerial Refueling Aircraft." Statement of Neal P. Curtin, Director Defense Capabilities and Management. GAO-0301048T. July 23, 2003. p.7

[24]"Military Aircraft: Considerations in Reviewing the Air Force Proposal to Lease Aerial Refueling Aircraft." Statement of Neal P. Curtin, Director Defense Capabilities and Management. GAO-0301048T. July 23, 2003. p.3

both the KC-135E and the KC-135R as 85%.[25] The study did not give a time period for this MCR estimate.

Because of the GAO and Air Force studies, some debate has focused on the time, or duration of MCR estimates and the impact that these factors might have on the applicability of estimating over the long term. For example, the Air Force has discounted some GAO MCR estimates, noting that they were for short time periods, and that even aircraft with low MCRs can have "spikes" of higher availability. The KC-135's performance during Operation Iraqi Freedom is an example of this phenomenon, KC-767 lease supporters say. The KC-135's 86.4 percent MCR during this conflict has not been sustained over the long term, lease supporters argue.

Lease opponents would agree that short term MCRs might not be the most reliable of an aircraft's long term MCR. But, lease opponents argue, "when the chips were down," the KC-135 fleet did achieve, and actually exceeded MCR goals. Also, the KC-135's 86.4 MCR was higher than the MCRs for many other aircraft that participated in the Iraq war: A-10, B-1B, B-2, B-52, E-3B, E-8C, F-117, F-15 (all models), F-16 (all models), KC-10, U-2, and Predator and Global Hawk UAVs. Lease opponents concede that the KC-135's 86.4 percent MCR is higher than normal and likely due to extraordinary wartime efforts. But that is also likely the case for the 13 other aircraft types that had lower MCRs than the KC-135. This comparison shows, opponents argue, that KC-135 availability can be on par with, if not superior to other aircraft, and claims about low MCR are not a compelling reason to retire the fleet prematurely.

The MCR is only calculated for those aircraft not otherwise unavailable due to depot maintenance or training requirements. Few KC-135Rs and no KC-135Es are used for training. Therefore, the number of aircraft in depot, and the amount of time they spend there are also important factors that affect aircraft availability.

The KC-135's maintenance history is well established. As the aircraft has aged and as age-related problems have become more acute, it has taken more effort to complete scheduled maintenance, called Programmed Depot Maintenance (PDM). The KC-135's maintenance problems appeared at their worst in 1999, when 176 aircraft (32 percent of the fleet) were in depot at the same time. It was at this point, both the Air Force and KC-767 lease opponents agree, that the Air Force had to make a concerted effort to improve depot maintenance and processes. According to one Air Force study, the Chief of Staff of the Air Force directed his staff and the Air Force Mobility Command to "fix the depot."[26] The result was a marked improvement in aircraft availability from FY2001 to FY2003. By some estimates, KC-135s are today spending 45 percent less time in depots than they were two years ago,[27] and 100

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[25]White Paper on KC-767A. The Aircraft to Begin Our Tanker Recapitalization. HQ AMC/XPR January 10, 2003. Table 3 "Combat Capability Comparison (Logistics), p. 5.

[26] "KC-135E Business Case Analysis." Headquarters, USAF. May 1, 2003. p.15.

[27] Rep. Duncan Hunter. "U.S. Representative Duncan Hunter Holds Hearing on Air Force Tanker Lease Program." July 23, 2003 FDCH Political Transcripts. Washington, DC.

more aircraft are now available to the warfighter than in July 2000.[28] Where the Air Force and KC-767 lease opponents diverge, however, is what this recent improvement in availability implies for the future.

The Air Force acknowledges that fewer KC-135s are in depot. However, this doesn't mean that less work is being done to maintain the KC-135, officials say. In fact, the opposite is true; more work is being done on them while they are in depot. KC-135 depots added a second shift, and PDM man-hours have doubled from 16,000 to 33,000 despite the improvement in the number of aircraft in depot.[29] Reducing the number of KC-135s in depot to a manageable level is a real success story, Air Force officials say. However these improvements have come at a real monetary cost, and aren't expected to get any better. According to one Air Force official, "we mined all the gold we can there."[30]

Lease opponents say that Air Force assertions that depot maintenance can't further improve are unproven. When the Air Force projects the future costs of acquiring new aircraft (such as the F/A-22) it often banks on "future savings" that will result from manufacturing improvements that don't exist today, but are expected to emerge in the future. Why are depot maintenance improvements a dead end, lease opponents ask, when manufacturing improvements for new aircraft are projected to occur as an article of faith? For example, depot workers discovered how to save $500,000 per aircraft by conducting 60-hour fuel filter checks and scrubbing fuel tanks rather than engaging in topcoat removal procedures. KC-135 depots improved their processes by paying heightened attention to critical path management, and "kitting" major structural repair parts.[31] Current workers at Tinker, AFB – one of three KC-135 depots -- report that present flow time for aircraft in and out of PDM is still decreasing thanks to process improvements.[32] What is prohibiting, lease opponents ask, depot workers from "climbing the learning curve," and discovering new maintenance improvements?

Corrosion and Fleet-Wide Grounding. The Air Force has recently said that the need to replace the KC-135 fleet is urgent because the aging aircraft is prone to mechanical or structural problems that could result in a fleet-wide grounding. The July 10th Air Force report to Congress on the KC-767 lease argued that there were "...increasing possibilities that this 43-year-old aircraft could encounter a fleet-grounding event, crippling our combat forces." (p.2.) Former acquisition chief Pete Aldridge, for example, remarked, "'We cannot continue to fly the KC-135s forever,

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[28] *KC-135 Tanker Aging Aircraft Story*. General Handy, CINCTRANSCOM. General Lyles, Commander AFMC. August 2, 2002.

[29] *KC-135 Tanker Aging Aircraft Story*. General Handy, CINCTRANSCOM. General Lyles, Commander AFMC. August 2, 2002.

[30] Major General Paul W. Essex, Director, Plans and Programs, HQ Air Mobility Command. "U.S. Representative Duncan Hunter Holds Hearing on Air Force Tanker Lease Program." July 23, 2003 FDCH Political Transcripts. Washington, DC.

[31] "Fact Sheet." Office of Legislative Liaison. USAF. August 13, 2003.

[32] Conversation between CRS and Tinker AFB employees. August 19, 2003.

and the longer you wait to recapitalize, the more you run the risk...of a fleet of those aircraft being grounded for some reason.'"[33]

Much of the Air Force's concern over the prospects of fleet-wide grounding is based on the KC-135's problems with corrosion. The KC-135 is particularly susceptible to corrosion. The materials and manufacturing techniques used to produce this aircraft in the 1950s did not reflect modern corrosion prevention techniques. The Air Force cannot accurately predict the extent or cost of corrosion, Air Force officials now say, and currently lacks mature diagnostic tools that could help safely and economically extend the life of the KC-135 fleet.[34] Because of corrosion's unpredictability, the Air Force is concerned that it has little idea if, when, or how badly the next big corrosion problem will appear.

Air Force officials say they have recently experienced a "wake up call" regarding the viability of the KC-135 fleet, and it is prudent to take heed of this warning. On January 13, 2003 a KC-135 crashed in northwestern Germany, killing all four crew members onboard. Investigating the cause of this accident, Air Force officials found problems with the aircraft's stabilizer trim actuators. Between September 1999 and February 2000, 139 aircraft (24% of the total fleet, 40% of the aircraft available) were grounded for repair.[35] If this grounding had happened during an important operation, such as, Operation Iraqi Freedom, the Air Force's ability to project power would have been diminished, and the conflict could have been prolonged, possibly resulting in higher casualties. The bottom line for the Air Force is, in the words of acquisition chief Marvin Sambur that "we have no confidence in the Es right now."[36]

Lease opponents do not dispute the fact that the KC-135 is old or that is has corrosion problems. They take issue however, with the Air Force's depiction of the problem.

The KC-135 fleet clearly suffers from corrosion, and this causes noteworthy maintenance problems. However, lease opponents say, the Air Force makes observations about corrosion that appear out of sync with the experience of other military services. The Navy and Marine Corps have had to deal with the effects of corrosion since the inception of naval aviation because their aircraft operate in much more corrosive environments that the Air Force typically does. Engineers at the

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[33]John Tirpak. "100 Tankers" *Air Force Magazine.* August 2003.

[34] *USAF Need for KC-135 Recapitalization: Operational, Maintenance & Economic Implications*. A September 2002 Reassessment of the KC-135 Economic Service Life Study. U.S. Air Force.

[35] Frank Wolf. "Air Force Conducting KC-135 Systems Assessment. *Defense Daily.* November 18, 1999. and "Point Paper on Fleet Wide Grounding of Aircraft." Office of Legislative Liaison, USAF. August 14, 2003.

[36] Dr. Marvin Sambur, Assistant Secretary of the Air Force (Acquisition). "U.S. Representative Duncan Hunter Holds Hearing on Air Force Tanker Lease Program." July 23, 2003 FDCH Political Transcripts. Washington, DC.

Navy's Naval Air Systems Command remark that "corrosion is a known problem that the Navy takes proactive steps to manage."[37]

As far back as 1965, the Air Force recognized that corrosion was a problem that it would increasingly face in the future. One study recognized that the Navy had instituted effective corrosion protection and prevention measures and recommended that the Air Force emulate Navy procedures and initiate additional procedures to better mitigate corrosion problems.[38] Why, lease opponents ask, is corrosion difficult for the Air Force to predict, and why are its diagnostic tools "immature," when this problem has been known for 40 years? Current claims that corrosion is difficult to predict also appear in conflict with Air Force statements in the ESLS of just two years ago that appear quite predictive: "Aging-related structural repairs due to corrosion will continue to increase at a manageable rate."[39]

Lease opponents also say that the Air Force appears to be exaggerating the risks and potentially the consequences of a fleet-wide grounding of the tanker fleet. Many note that "By having 90 percent of its refueling fleet in one aircraft type, the Air Force for some years now has been accepting the risk of fleet-wide problems that could ground the entire fleet."[40] If the Air Force has been living with this risk for many years, why, lease opponents ask, has concern only been voiced recently?

The Air Force claims that the September 1999-to-February 2000 grounding of 24% of the KC-135 fleet was a serious warning that similar groundings could happen in the future, and that such events could threaten U.S. power projection capabilities. If true, lease opponents ask, why has the Air Force only begun discussing this recently? The 2001 ESLS study did not mention concern over fleet-wide grounding. No Air Force congressional testimony included discussion of this event until June 2003, and no Air Force or DOD official was reported in the press to have expressed any concern about fleet-wide grounding prior to April 2002.[41] If the Air Force were concerned about the risks of fleet-wide grounding, lease opponents say, it would have made this case soon after the four-month event. Waiting until the KC-767 lease was being debated diminishes the strength of the Air Force's argument, lease opponents say. Furthermore, critics say, the Air Force appears to be overstating the consequences of the four-month KC-135 grounding episode. The United States successfully prosecuted Operation Allied Force (the air war over Kosovo), with 40% of the fleet unavailable. This conflict saw the largest deployment of air assets and aerial refueling aircraft since the 1991 war in Iraq, proving, critics say, that the Air

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[37]Conversation between CRS and Navy officials at the Naval Air Systems Command (Naval Air Station Pax River). August 13, 2003.

[38]Lieutenant Colonel (USAF) Robert C. Drebelbis. "Corrosion as a Problem to the Air Force." RAND. Santa Monica, CA. March 1965. P-3080.

[39] *KC-135 Economic Service Life Study.* Technical Report. February 9, 2001. p.vi.

[40]"Military Aircraft: Considerations in Reviewing the Air Force Proposal to Lease Aerial Refueling Aircraft." Statement of Neal P. Curtin, Director Defense Capabilities and Management. GAO-0301048T. July 23, 2003. p.7

[41] Vago Muradian. "Air Force Sees Merit In Mixed Boeing-Airbus Tanker Fleet." *Defense Daily International.* April 12, 2002.

Force was clearly able to make do with their diminished assets. Furthermore, the United States also participated in far-flung stabilization and humanitarian operations in Venezuela and East Timor at the same time as forces were engaged in Kosovo. Aircraft are frequently grounded to address new-found mechanical problems[42], critics say. Moreover, there's nothing to say that the KC-135 fleet is any more prone to a catastrophic event than many other aircraft in the Air Force and Department of Navy inventories.

Post 9/11 KC-135 Usage and New Military Strategy. The Air Force has recently argued that another factor contributing to the urgency of replacing the KC-135 fleet is the unanticipated increase in KC-135 flying hours. Relatedly, the Defense Department revised its military strategy in light of post September 11th security requirements, and this new strategy will put increased strains on a force that already falls short of tanking needs.

Since September 11, 2001, Air Force officials say, the tanker fleet has been key to protecting the U.S. homeland (Operation Noble Eagle), and prosecuting the global war on terrorism (Operations Enduring Freedom and Iraqi Freedom). While performing admirably, Air Force officials say "...the KC-135's...are beginning to show real signs of wear and are being used at a steady state tempo over the last two years that were never forecast or even imagined before September 11, 2001."[43] Flying hours for the KC-135s averaged about 300 hours per year between 1995 and September 2001. Since then according to the GAO, employment is averaging about 435 hours per year.[44] This unanticipated use, KC-767 lease proponents say, is wearing out the 42 year old aircraft even faster than anticipated just 3 years ago.

Lease opponents recognize the upturn in flight hours, but challenge that the consequences are as negative as the Air Force contends. Corrosion, lease opponents point out, is the limiting problem with the KC-135, and increased use does not make corrosion worse. If the KC-135's limiting factors were flying hours, or metal fatigue, for example, the increase in flying hours could have a noteworthy detrimental impact on the KC-135's remaining life. Increased flying hours, however, have less impact on the aircraft's corrosion problems, they say. Lease advocates concede that increased flying hours do not directly make corrosion worse. They point out however, that increased flying hours may lead to deferred depot maintenance, where corrosion problems would be addressed. Thus, increased flying hours can indirectly exacerbate corrosion problems.

The Air Force also argues that today's tanker fleet is facing a new set of requirements that is more challenging than past requirements – and that the fleet

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[42] David Fulghum. "EADS Fuels Tanker Challenge." *Aviation Week & Space Technology*. August 4, 2003 p. 25.

[43] Dr. Marvin Sambur, Assistant Secretary of the Air Force (Acquisition). "U.S. Representative Duncan Hunter Holds Hearing on Air Force Tanker Lease Program." July 23, 2003 FDCH Political Transcripts. Washington, DC.

[44] "Military Aircraft: Considerations in Reviewing the Air Force Proposal to Lease Aerial Refueling Aircraft." Statement of Neal P. Curtin, Director Defense Capabilities and Management. GAO-0301048T. July 23, 2003. p.2

could not satisfy the old requirements. Rather than defeat two major regional adversaries (the old strategy), the new strategy (outlined in the Defense Planning Guidance FY04-09) requires the military to 1) defend the United States, 2) deter aggression and coercion in four critical regions, 3) swiftly defeat aggression in two overlapping major conflicts, and 4) upon the President's direction, win decisively against one of the two major conflict adversaries. According to Air Force documents the new strategy "...coupled with anti-access/area denial challenges show increasing importance and reliance on a viable, sustainable, effective tanker fleet."[45] These increased requirements argue strongly, the Air Force says, for recapitalizing the tanker fleet as soon as possible.

Those skeptical of the KC-767 lease challenge the Air Force assertion that the new strategy will automatically result in increased tanking requirements. Opponents challenge this assumption first, because the Air Force has not conducted a tanker requirements study since the new strategy has been declared. When asked how the Air Force could be so sure of its future requirements considering the lack of analysis, one Air Force official replied:

> Because we're convinced that the requirement for air refueling is large and will continue to be very large. As we talked just a moment ago, the requirement is growing, actually, although I can't give you a specific number right here for how much it's grown, based on the new Defense Planning Guidance, yet. But we know it's growing, we know it's going to continue to be very large...[46]

Lease opponents agree that conventional wisdom suggests that the new military strategy could demand increased tanker capabilities. However, they say, conventional wisdom is often wrong. Determining future tanker capabilities is very complex, and really requires serious analysis. The Air Force does not know what its requirements are going to be 10, 20, 30, or 40 years hence, and it certainly does not know what future Navy or Marine Corps tanker requirements will be. What will be, opponents ask, the net effect on tanking of more aggressive and pervasive fielding of unmanned aerial vehicles (UAVs)? Will these more fuel efficient platforms reduce requirements as they replace manned aircraft in the inventory? Or will UAVs continue to augment, rather than replace manned aircraft, and thus add to tanker requirements? Many suggest that air ships (blimps) and unmanned tethered balloons (aerostats) will likely replace AWACS for a variety of surveillance missions in the future; such as homeland defense. If this transition occurs, and when, may have implications for future tanker requirements.

Lease opponents also note that dramatic improvements in targeting and weapon miniaturization is translating into fewer combat sorties, which, in turn, means fewer refueling sorties. Although a simple comparison, lease opponents say one can compare airpower in the last two wars with Iraq and conclude that, the Air Force can

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[45]White Paper on KC-767A. The Aircraft to Begin Our Tanker Recapitalization. HQ AMC/XPR January 10, 2003. p.2.

[46] Major General Paul W. Essex, Director, Plans and Programs, HQ Air Mobility Command. "Hearing of the Projection Forces Subcommittee of the House Armed Services Committee." 2118 Rayburn House Office Building. June 24, 2003. Federal News Service, Inc.

already do "more with less." How much more effective will tomorrow's air operations become as current R&D programs reach fruition, and what effect will this have on tanking needs? These questions, lease opponents argue, require a study to answer, and it cannot be assumed that tomorrow's aerial refueling needs will exceed today's.

Table 1. Aerial Refueling and Combat in Two Conflicts

	1991 Desert Storm[47]	*2003 Iraqi Freedom*[48]
USAF Tankers Deployed	224: (30 KC-10) (194 KC-135)	182: (33 KC-10) (149 KC-135)
USAF Tanker Sorties	11,024	6,193
Combat Sorties (All Services)	57,631	18,695

Finally, lease opponents ask why the Air Force is planning to prematurely retire 68 KC-135E models. If the current fleet is deficient today, and tomorrow's requirements are to be even more difficult to satisfy, why doesn't the Air Force want new tankers in addition to, rather than in lieu of, the 68 KC-135Es, lease opponents ask. Premature retirement of 68 KC-135Es, they say, reduces the strength of the Air Force's argument that recapitalization is required to satisfy growing tanker requirements.

Air Force officials recognize that, on one level, retiring 68 KC-135Es can appear inconsistent with the stated concern over increasing tanker requirements. Also, Air Force studies, such as the May 1, 2003 BCA, do indicate that early retirement does incur a small amount of risk in terms of reduced tanker capabilities between the years FY03 and FY14. However, the O&M costs of maintaining the oldest KC-135Es is so onerous, the Air Force says, that cost savings achieved from retirement more than make up for this slight decrease in capability. Furthermore, savings from retiring the 68 aircraft can be reinvested in the remaining fleet to increase its availability, and also help fund tanker recapitalization efforts.[49]

Is the KC-767 the Best Aircraft for the Job?[50]

If the Air Force need to replace the KC-135E fleet is urgent, then the number of replacement options is narrowed. Those options that can be implemented more quickly become more attractive than those that take longer to implement. The Air

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[47] *Gulf War Air Power Survey*. Statistical Compendium and Chronology. Vol. V. Washington, DC. 1993. P.232.

[48] *Operation Iraqi Freedom – By the Numbers*. USCENTAF. Assessment and Analysis Division. April 30, 2003. p.7-8.

[49] "KC-135E Business Case Analysis." Headquarters, USAF. May 1, 2003.

[50] This section was written by Christopher Bolkcom; Specialist in National Defense; Foreign Affairs, Defense, and Trade Division.

Force presents the KC-767 lease as the most timely solution to its recapitalization problem, and the KC-767 airframe as the most effective way to improve aerial refueling capabilities.

It is important to understand how well KC-767 attributes match Air Force needs because if leased and then purchased, these 100 aircraft could likely be in the inventory for at least 50 years. Also, many believe that if the Air Force is successful in leasing and purchasing these 100 aircraft, it will attempt to lease and/or purchase some additional number of KC-767s, perhaps up to another 100.[51] Former defense acquisition chief Pete Aldridge, for example, was reported to have said that DOD plans to purchase more than the initial 100 KC-767s. Aldridge said that DOD was successful in negotiating a lower price for the KC-767 by promising follow-on purchases.[52] Boeing officials deny any government commitment for anything but the number of aircraft in the current KC-767 lease.[53]

Five comparisons can be made when considering the KC-767 aircraft and its ability to satisfy the aerial refueling mission needs:

- How does the KC-767 compare to the aircraft it will replace?
- How well does the KC-767 meet operational requirements?
- How does the KC-767 compare to surplus aircraft available on the commercial market?
- How does acquiring the KC-767 compare to re-engining the KC-135Es?
- How does acquiring the KC-767 compare to leasing aerial refueling services?

KC-767 vs KC-135. The Air Force compares the KC-767 to the KC-135, and says that the new aircraft is clearly superior to the old. The KC-767 is more flexible and more capable than the KC-135, supporters argue. All KC-767's for example, like the KC-10, will be aerial refuelable. The KC-767 can carry 108 patients in its Aeromedical role, compared to the KC-135's 24 patients. The KC-135 can only refuel Navy and coalition aircraft after maintenance personnel spend six-to-24 hours attaching a temporary drogue to the refueling boom. The KC-767's drogue is integral to the aircraft. Furthermore, the KC-767 can use either the boom (to refuel Air Force aircraft) or the drogue (to refuel Navy, Marine Corps, or allied aircraft) on the same mission. The KC-135 can use either the boom or the drogue on the same mission,

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[51] John Tirpak. "100 Tankers." *Air Force Magazine.* August 2003. "...he (Donald Rumsfeld) blessed language stating the intent of the Defense Department to 'go beyond the first 100 767s' with additional acquisitions."

[52] John Donnelly. "Tanker Deal is 'Unmatched,' Advocates Say." *Defense Week.* August 4, 2003.

[53] If the Air Force does lease or purchase of an additional number of KC-767 aircraft beyond the currently discussed 100, it would appear to contradict the Air Force's current Tanker Roadmap, which calls for conducting an AOA after the lease is established, to determine the best tanker capabilities and characteristics to recapitalize the remainder of the KC-135 fleet.

but not both. The KC-767's cargo carrying capacity is over twice as large as the KC-135s: 77,000 lbs on 19 pallets compared to 36,000 lbs on 6 pallets. [54] Also, the KC-767's ability to operate from shorter runways (8,000 feet) than the KC-135 (12,000 feet) will provide greater flexibility and options. There are approximately 8,000 airfield world wide from which the KC-767 will be able to operate compared to 228 for the KC-135.[55]

In addition to being more capable, the KC-767 should also be much more available than the KC-135, the Air Force says. As demonstrated by Table 2 below, the KC-767 is estimated to be more available to the warfighter than the KC-135. Over a six-year period, a given KC-135E aircraft can be expected to be available only 60 percent of the time. The 870 days of unavailability (out of a total number of 2,190 days in six years) is caused by the maintenance activities and modifications described below. Flight line and scheduled depot maintenance cause the bulk unavailability.

Table 2: Projected Aircraft Availability

(*Days not available to the warfighter in a 6-year period per aircraft*)[56]

	KC-135E*	KC-135R*	KC-767**
Scheduled Depot	325	288	48
Unscheduled Depot	19	19	31
Mods	62	62	0
Flight Line Maintenance	464	346	95
Total Not Available	870	715	174
Bottom Line Available	60%	67%	92%

* Based on **actual data** extended over a 6-year operational time frame
** Based on FY12 fleet **projections** extended over a 6-year period.

KC-767 versus Operational Requirements. In many ways, lease opponents admit, the KC-767 does compare favorably to the KC-135. However, lease opponents say, the Air Force does not make the most important comparison between the aircraft, which is maximum fuel capacity. Despite its modernity, the KC-767 only carries 1 percent more fuel (2,000 lbs) than the KC-135. The KC-767's cargo and aeromedical capabilities, for example, are second order issues for consideration, lease opponents say. These aircraft are being acquired to provide fuel,

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[54] *Tanker Roadmap* (Draft). Colonel Scott Wuesthoff. Chief, Global Mobility Panel. AF/XPPM. June 18, 2003. P.10.

[55] White Paper on KC-767A. The Aircraft to Begin Our Tanker Recapitalization. HQ AMC/XPR January 10, 2003. P.3.

[56] Adapted from *Tanker Roadmap* (Draft). Colonel Scott Wuesthoff. Chief, Global Mobility Panel. AF/XPPM. June 18, 2003. P.10. Emphasis of text in bottom row added by CRS.

and when comparing total fuel carrying capability, the KC-767 represents almost negligible improvement over the KC-135.

Another more meaningful evaluation of the KC-767's performance is how it compares to Air Force requirements. Air Force aerial refueling requirements are expressed in the Operational Requirements Document (ORD) (HQ AMC/XPR, October 22, 2002). Lease opponents say that the KC-767, while looking good compared to the KC-135, does not measure up in many important areas to the ORD yardstick.

The ORD requires, for example, that the KC-135's replacement be able to refuel two aircraft simultaneously with the hose-and-drogue system. The KC-767 variant being considered in this lease cannot satisfy this requirement. It can only refuel one aircraft at a time with the hose-and-drogue which considerably reduces, opponents say, its operational capabilities.

Another KC-767 shortcoming, opponents say, is the aircraft's inability to offload multiple types of fuel on the same mission. The ORD lists this objective because it would greatly enhance the aircraft's ability to simultaneously fuel both Air Force and Navy and Marine Corps aircraft. Both service's aircraft can operate on the same fuel if necessary. However, to minimize the hazard of shipboard fires, Navy and Marine Corps aircraft regularly use a type of fuel less prone to ignition than the standard Air Force fuel. Carrier-based Navy and Marine Corps aircraft will only use Air Force fuel infrequently, because their tanks must be emptied prior to landing, and their fuel systems must be flushed clean to avoid contaminating the carrier's fuel supply with the Air Force's more combustible fuel. Thus, a KC-767 able to offload only one type of fuel on a single mission is much more limited in the types of aircraft it can service, contend lease opponents.

Some of the capabilities that the Air Force and Boeing tout sound attractive, opponents say, but they aren't required by the ORD. This brings into question how important these capabilities really are. The ability to operate from runways less than 12,000 feet is one example. The Air Force also reportedly wanted the KC-767 built in a "combi" configuration that would permit it to carry passengers and cargo at the same time. This configuration, however, would have required building a special bulkhead, and would have presumably increased the cost of the aircraft, so the plan was dropped.[57] The loss of this capability, opponents say, is another example of how the KC-767 might look good compared to a 42 year-old aircraft, but still might not have the attributes most attractive in a new aerial refueling aircraft.

The Air Force and other lease supporters could counter these criticisms by pointing out that the KC-767 does satisfy the majority of ORD requirements. It is unrealistic to expect an aircraft to satisfy all of the requirements, and the many that the KC-767 does satisfy more than make up for the one or two that it does not. The ability to offload more than one type of fuel on a single mission is an ORD objective, lease supporters argue, not a requirement. Also, supporters point out, provisions

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[57]John Tirpak. "100 Tankers." *Inside the Air Force.* August 2003.

have been made to add hose-and-drogue wing pods – which would enable simultaneous refueling of two aircraft – if future needs warrant.

KC-767 versus Other Aircraft. Another way to determine if the KC-767 is the best aircraft for the job is to compare it to other available aircraft. The Air Force says that it evaluated 747, 757, 767, 777, and A330 aircraft, and found the 767 the best candidate for the aerial refueling mission.[58] These aircraft are not the only alternatives to be considered, critics argue. Lease opponents note that there is currently a glut of excess commercial airliners on the market, and the Air Force could more cheaply buy some number of these unwanted aircraft and convert them into tankers. Some estimate that over 700 surplus commercial airliners are in long-term storage facilities in the American southwest alone.[59]

Surplus Boeing DC-10 aircraft, for example, appear to be excellent candidates for conversion into tankers and for recapitalizing some portion of today's KC-135 fleet, lease opponents say. The Air Force already operates 59 converted DC-10s – called KC-10 *Extenders*. These aircraft have almost twice the maximum fuel capacity of both the KC-135 and the KC-767. Using the Air Force's own comparative metrics, the KC-10 is a 1.95 KC-135 equivalent – in other words, it has 195 percent of the KC-135's fuel carrying capabilities. Thus, 50 KC-10s have roughly the same tanker capabilities as 100 KC-135s. Also, lease opponents point out, the KC-10 can use the refueling boom and the hose-and-drogue systems on the same mission. The KC-10 also has a much larger cargo carrying capacity (170,000 lbs) than either the KC-135 or the KC-767. This large capacity would also be a boon to the Air Force's strategic airlift capabilities, which are currently hard pressed to meet the requirements established in the Air Force's latest requirements study.[60]

In addition to these operational advantages, lease opponents point out that buying and converting surplus DC-10s into KC-10s offers significant financial advantages over the KC-767. Surplus DC-10s are being offered for sale for $600,000 to $10.3 million each.[61] If 50 surplus DC-10s could be purchased for $10 million each, and if the tanker conversion cost another $40 million[62], the Air Force could replace the oldest 100 KC-135s with 50 tankers that are twice as capable for a only $2.5 billion, lease opponents say. Just as important, the Air Force has already invested in KC-10 training, O&M, and military construction. These investments would have to be borne anew for a KC-767 fleet. Between 42 and 57 DC-10 aircraft

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[58] *KC-767A Report to Congress Status Brief*. Headquarters U.S. Air Force. July 15, 2003. P. 14-16.

[59] Edward Wong. "Airlines' Unwanted Fleet Grows in Desert." *New York Times.* June 7, 2003.

[60] See CRS report RS20915, which points out that the current strategic airlift fleet is approximately 10 million ton miles per day (MTM/D) short of the 54.5 MTM/D requirement.

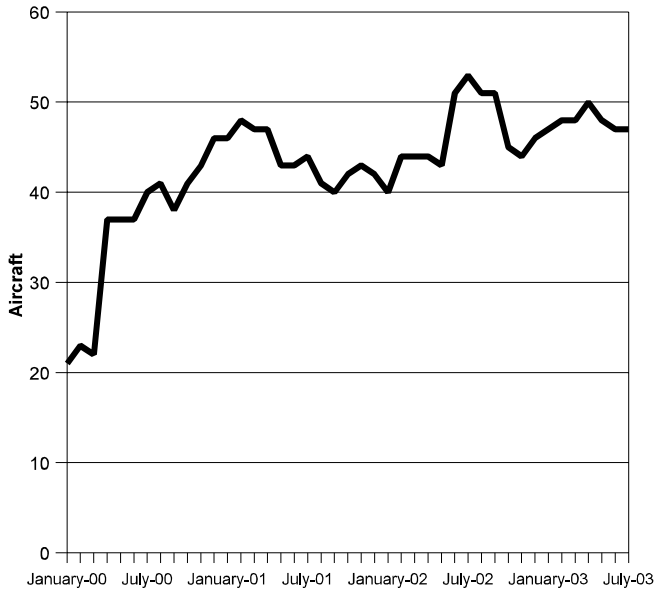
[61] "Semi-Annual Jet Aircraft Value Listing." *Aircraft Value News.* July 28, 2003.

[62] The cost of the aerial refueling components of the KC-767 is roughly estimated to be approximately 30 percent of the cost of the 767 ($138 million), or $40 million. Source: CRS meeting with Boeing representatives, July 30, 2003.

were available for sale or lease between September 2002 and August 2003.[63] At least twenty five of these aircraft were equipped with the same CF6-50C2 engines as the Air Force's KC-10 fleet.[64]

The Air Force could counter the arguments above with several points. First, surplus DC-10s are used aircraft. Used aircraft conditions vary widely, and not all may be in acceptable condition. How much life is left in each aircraft? Commercial airlines put many more flight hours annually on their aircraft than does the military. How well has the aircraft been maintained? The Air Force has purchased and converted surplus commercial aircraft before, it says, and has run into difficulties. The Air Force's first two E-8A JSTARS development airplanes were 20-year-old commercial Boeing 707s. Conversion difficulties and questions of remaining service life convinced the Air Force that it needed to design and implement a more robust inspection and verification program to ensure the that surplus aircraft being considered actually have the capabilities and characteristics advertised. Relatedly, the Air Force could argue, the DC-10 is yesterday's technology. While the Air Force's 59 KC-10s are very capable tankers, their future is limited. The DC-10's 1980s-era design and components do not offer all the opportunities represented in a brand new aircraft. The KC-767 will offer room for technological growth that the KC-10 can't match.

Figure 5. DC-10 Availability



Source: Speed News http://www.speednews.com/listings/index.shtml

[63][http://www.airtrading.com. August 4, 2003].

[64][http://www.speednews.com. August 1, 2003].

KC-767 versus Re-Engining KC-135Es. Another contentious debate has arisen over re-engining KC-135E aircraft – essentially turning them into KC-135Rs. KC-767 lease critics say that re-engining the KC-135E has many merits that should be considered as an alternative to leasing 100 new aircraft. Upgrading the E's engines will increase the aircraft's takeoff power, cruise speed and other performance parameters. Despite their old age, the KC-135Es have only used approximately half their flying hours. Re-engining them to improve their performance over their remaining lifetime, perhaps 35 more years, would be a cost-effective and prudent step, many argue.

A major advantage of this approach, lease critics say, is timeliness. If the need for improved tanker capabilities is urgent, as the Air Force argues, then upgrading the "E" fleet to R models may be the quickest solution.[65]

The second advantage of this approach is cost. The GAO estimates that re-engining 127 KC-135Es would cost $3.6 billion, a much lower figure, lease opponents say, than the Air Force's $17.2 billion estimate for leasing the KC-767, or the $24.6 billion total program cost (plus the $4.4 billion likely spent at the end of the lease to purchase the aircraft.)[66] Not only is the cost of the re-engining procedure low, compared to the 767 lease, but this approach also saves money by avoiding projected maintenance on the old engines that will be replaced. Much of the increased cost projections for the KC-135 from 2001 to 2040 have to do with engine maintenance. According to the ESLS study: "E-model per A/C Engine Costs are 20 times the R-Model."[67] Thus, the out-year maintenance costs avoided by this re-engining will help finance the $3.6 billion initial investment, lease opponents argue.

A third advantage of re-engining is that it will eliminate one of the KC-135E's most challenging maintenance problems: corrosion of the engine strut. Corrosion-induced maintenance and repair of the KC-135E engine struts have recently been estimated at $3 million per aircraft.[68] Concerns over the effects of corrosion on this key structure have also led the Air Force to impose flight restrictions on the E-models. Eliminating these problems, in addition to the cost savings and performance improvements, argues strongly for re-engining, lease opponents say.

The Air Force is strongly opposed to re-engining the KC-135E fleet. According to the GAO, the Air Force has not requested funds for re-engining E-models since 1993. Congress or DOD have added funds to upgrade approximately 2 E Models per

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[65]"Preliminary Information on Air Force Tanker Leasing." Neal Curtin. Director, Defense Capabilities and Management. GAO-02-724R. May 15, 2002.

[66]John Tirpak. "100 Tankers" *Air Force Magazine.* August 2003.

[67] *KC-135 Economic Service Life Study*. Tanker Requirements Study for FY05. HQAMC/XPY. P.13 "Engine Cost Growth."

[68] *USAF Need for KC-135 Recapitalization: Operational, Maintenance & Economic Implications*. A September 2002 Reassessment of the KC-135 Economic Service Life Study. U.S. Air Force. P.6

year to R Models at a cost of about $29 million per aircraft."[69] The Air Force makes a number of arguments against re-engining. First, only 100 of the E-models are candidates for re-engining.[70] So, if re-engined, the final number of R-models in the inventory would be at least 27 fewer than advocates of this approach believe. Second, re-engining will improve some of the KC-135E's capabilities, but it does nothing to address the underlying issue of the aging aircraft fleet. According to former DOD acquisition chief Pete Aldridge, the upgrade from E-models to R-model "will not buy you any lifetime, and that's what we need to buy: additional life."[71]

The third argument the Air Force makes against re-engining the KC-135Es is one of immediate and longer-term availability. Re-engining the Es would remove them from the active inventory for at least six months. Re-engining, the Air Force argues, would decrease the availability of air refueling tankers when the Air Force has the highest demand on tankers – now, during a war. Re-engining the KC-135E fleet would leave "tired iron" in the inventory that would degrade mission capable rates relative to a new aircraft.

Fourth, the Air Force says, while re-engining may obviate corrosion problems with the engine strut, it will not address any of the numerous remaining problems such as the wing attachment fittings, electrical wire replacement, and body skin replacement that will continue to plague the KC-135R fleet.

The final Air Force argument against re-engining the E-fleet is economic. KC-135Es have approximately 80 percent the capability of a KC-135R. If the Air Force were to re-engine and convert the E-model to an R-model, it would gain a 20 percent increase in capability for the $38 million investment. This is a poor deal, the Air Force argues. Also, according to Air Force studies, converting E-models to R-models exacerbates the recapitalization problem considerably, because it does not satisfy recapitalization requirements, it only postpones them. Furthermore, it postpones recapitalization with a significant investment ($3.87B for 100 aircraft) that will take decades to pay for itself, the Air Force argues.[72]

KC-767 versus Leasing Tanker Services. Those critical of the proposed 767 lease also say that there are other alternatives to purchasing or leasing an aircraft. Instead, the Air Force could reduce the KC-135's workload and buy time to explore other recapitalization options by leasing tanker services. The U.S. Navy, for example, has signed a five-year deal with a private company to refuel Navy and Marine Corps aircraft participating in exercises or flying from Atlantic to Pacific Coasts. The Navy does not own, or even lease the aircraft. It contracts to have tanker

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[69] *Air Force Tanker Leasing*. General Accounting Office. GAO-02-724R. May 15, 2002. p.14.

[70] Major General Paul W. Essex, Director, Plans and Programs, HQ Air Mobility Command. "U.S. Representative Duncan Hunter Holds Hearing on Air Force Tanker Lease Program." July 23, 2003 FDCH Political Transcripts. Washington, DC.

[71] John Tirpak. "100 Tankers" *Air Force Magazine.* August 2003.

[72] "KC-135E Business Case Analysis." Headquarters, USAF. May 1, 2003. p.E-2.

services provided. The Navy is reportedly satisfied with the company's cost – about half that of military aerial refueling – and reliability.[73]

The United Kingdom is also soliciting bids from private firms to provide its military with aerial refueling services. As a private finance initiative the source of refueling services would provide the Royal Air Force (RAF)with both the tanker and the support services. The RAF will own the services of the fleet – 10 aircraft for 27 years – but not the aircraft. The vendor would technically own the aircraft (which appear likely to be 767s) and would also make them available for third-party usage when not demanded by the RAF.[74]

Leasing tanker services would be more advantageous than leasing or buying KC-767's, lease opponents argue, for several reasons. Leasing tanker services could augment the Air Force's tanking quickly, thereby satisfying the Air Force's stated urgent need. Also, leasing service would avoid any kind of cost associated with recruiting, training and paying an aircrew. The Air Force currently suffers from very high operations tempo (OPTEMPO), as it deals with the unanticipated strains of fighting the global war on terrorism, lease opponents point out. This high OPTEMPO exacerbates a long standing problem the Air Force has had with too few KC-135 crews. Leasing tanker services could immediately ameliorate this problem. The current DOD leadership has a consistent track record of promoting outsourcing and privatization. Why not apply the same principles to recapitalizing the aerial refueling fleet, critics of the 767 lease ask?

Unlike the Navy, the Air Force has not yet hired private refueling services to support exercises or training. Supporters of the proposed 767 lease may argue that such services are inherently limited in their application: companies have a difficult time getting insurance for aircraft that fly into war zones. Also, it would be difficult, they argue to get private pilots to fly into contested areas. During Operation Iraqi Freedom the Air Force aggressively flew tankers well into Iraqi airspace. Would private pilots balk if asked to do the same? The number or companies willing to engage in such business is limited, lease supporters argue, and it is unlikely that companies currently in this line of work could provide the Air Force with the number of aircraft required to meet anticipated needs. So, while there may be some niche applications for leasing tanker services, most believe it is no replacement for fleet recapitalization. Also, most private companies can refuel Navy and Marine Corps aircraft, but not Air Force aircraft, so their application may be limited in that dimension as well. Outsourcing and privatization do have their applications, lease supporters agree, but Air Force tanker aircraft are combat systems, not a commissary or depot. To be effective and reliable, combat systems must be operated by, and controlled directly by the military, who are trained and disciplined to deal with combat situations.

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[73]Paul Lewis. "USAF and Omega Feud Flares Up." *Flight International.* August 20, 2002. and Ron Laurenzo. "Private Aerial Tanker Earns Navy's Praise." *Defense Week.* April 22, 2002.

[74] "Marshall Aerospace to Perform 767 Conversion For TTSC's FSTA Bid" *Defense Daily International.* June 6, 2003. (Unattributed)

Industrial Base Concerns[75]

In addition to the operational urgency arguments outlined above, the Air Force and lease supporters say that two industrial base concerns argue strongly for immediately implementing the KC-767 lease: leasing the 767 before its production line closes, and supporting the Boeing Company during a period of unusual economic hardship.

Viability of the 767 Production Line. The Air Force argues that the KC-767 lease should be implemented immediately because a lack of business may force Boeing to shut down this production line in the near future. In essence, if the Air Force does not act now, it may not have this opportunity again.[76]

A review of publically available information on the 767's business suggests that the 767 production line is not in imminent danger of being shut down. The backlog of production orders on the 767 line as of mid-August 2003 appears to be sufficient to sustain minimum-rate production through at least February 2006.[77]

Boeing's 767 production line has been able to maintain a production rate of 20 aircraft or less per year (less than two per month), and industry analysts estimate that the minimum sustainable rate for Boeing's commercial aircraft lies at approximately one aircraft per month.[78] At the end of 2002, thirty nine 767s had been ordered but not delivered. During 2003, 19 of these aircraft were completed and delivered, and another 11 were put on order. This means that, as of mid-August 2003, there is a production backlog of 31 commercial 767s. At the minimum sustainable production

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[75] The Industrial Base Urgency section was written by Daniel H. Else. Analyst in National Defense, Foreign Affairs, Defense, and Trade Division.

[76] Michael Wynne, Acting Undersecretary of Defense. "...Congress gave us pilot program authority to lease, this allowed the department to aggressively pursue a tanker design based on the 767 airframe before its commercial production lined ended, an option which might not have been available in FY'06."July 23, 2003 FDCH Political Transcripts. Washington, DC. An Air Force briefing offered in late 2002 stated that "Leasing replacement tankers is feasible today; USAF may not get an opportunity like this again." During May 2003, the then-Under Secretary of Defense for Acquisition, Edward C. "Pete" Aldridge stated "We've got to have a new tanker, and here's a chance to do it sooner. If it (767) goes out of production, who do you turn to? Airbus? I don't think so." See *USAF Need for KC-135 Recapitalization: Operational, Maintenance & Economic Implications. A September 2002 Reassessment of the KC-135 Economic Service Life Study. U.S. Air Force*. p. 23; and Les Blumenthal, "Boeing Deal Worth Billions," *The News Tribune* (WA), May 24, 2003, p. A1.

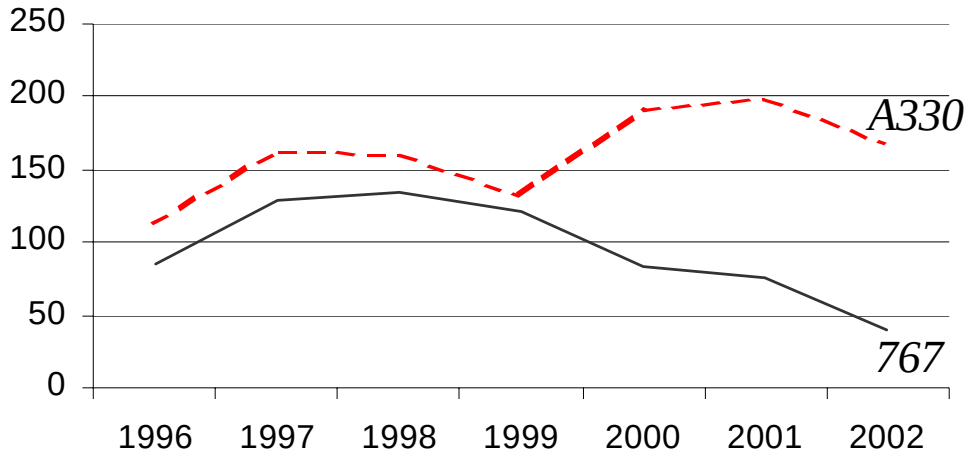
[77]This projection assumes that the production line will be maintained at the minimum sustainable rate. Should Boeing maintain a higher rate of production, the production line could be closed out much sooner. For example, if Boeing maintained a production rate of 3 aircraft per month, the current backlog could be depleted by July of 2004.

[78]See James Wallace, "Boeing Looks At One Line For Two Models," *Seattle Post-Intelligencer*, December 20, 2002, p. A1; and Helen Jung, "Boeing's 767 Tanker Deal a Boon to Ailing Line," *Associated Press Newswires* (May 23, 2003, 20:31.

rate of 1 aircraft per month, therefore, Boeing's production line for the 767 could possibly operate until February 2006 without any additional orders being placed.[79]

Beyond February 2006, the viability of the 767 production line is less certain. Commercial market demand for the 767 appears weak and shows few signs of future strength. The aircraft has steadily lost ground to its near-peer competitor, the Airbus A330, since 1998. (See Figure 6 below.) Boeing is in the late developmental stages of a new aircraft, the 7E7 *Dream Liner*, that will be offered for sale in 2004 and is expected to enter service in 2008.[80]

Figure 6. Boeing 767 and Airbus A330 Production Backlog



Source: CRS Chart based on data from Aerospace Industries Association

Some analysts have predicted that Boeing's alleged lack of commitment to marketing and improving the 767, coupled with the introduction of the 7E7, will not add many new sales to the current backlog, and could kill the civil airliner version

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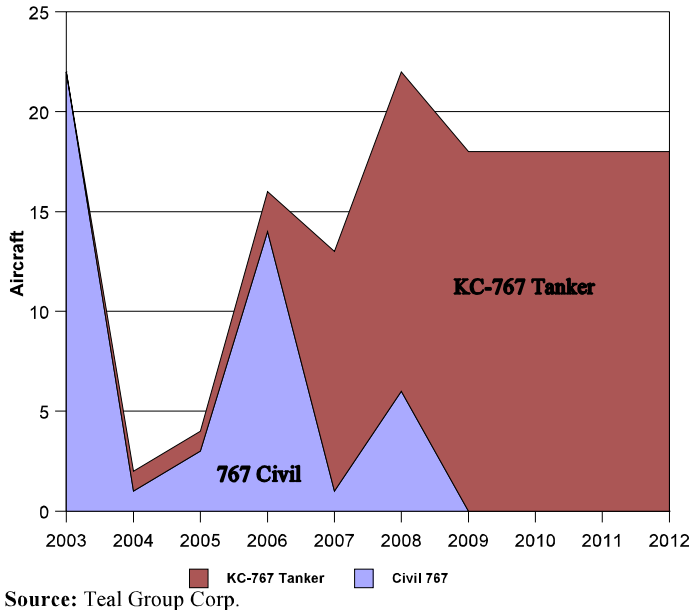
[79]This assumes that none of the outstanding orders will be canceled. During the first half of 2003, Uzbekistan Airlines placed two 767s on order. In July, Turkmenistan Airlines ordered an additional 767, and an undisclosed customer ordered an additional eight. Without these new orders, the production line might have shut down as early as August 2004. Production backlogs are the result of company production plans, marketing strategies, and customer demand.

[80]The 767 (in its -300 version) carries 218-269 passengers up to 4,020 nautical miles (7,450 km). The A330-300 carries 295-335 passengers up to 5,600 nautical miles (10,400 km). The 7E7 is being designed to use 15 to 20 percent less fuel than other comparable multi-aisle aircraft and will carry 200-250 passengers on routes between 7,200 and 8,000 nautical miles (13,334-14,816 km). Boeing expects to begin offering the 7E7 for sale in late 2003, with the first firm offers being made to airlines in early 2004. Boeing expects to begin production in 2005. First flight is expected in 2007 with certification, delivery, and entry into service occurring in 2008. Sources: Teal Group, Boeing, Airbus.

of the aircraft.[81] The production of the civilian 767 is now projected (See Figure 7 below) to continue at the rate of 12-15 aircraft per year only through mid-2008.[82]

Figure 7: Projected 767 Production



Source: Teal Group Corp.

Lease opponents are likely to point to these current and future business projections and argue that there is no urgency to leasing the KC-767. It could be available to the Air Force until at least 2006 and perhaps until 2008. Lease supporters, however, may say that these projections prove that the Air Force must move more quickly than its previous plan, which was to begin recapitalization in 2012. No one expects the 767 to remain in production that long, they may argue. Furthermore, supporters may argue, there is no guarantee that the line will stay open until 2006. The profit margin realized from building 767s at the minimum sustaining rate (one aircraft per month) is likely to be very small. Boeing could decide that in light of dwindling business, it may be more profitable in the long term to shut down the line sooner than 2006.[83]

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[81]See Helen Jung, "Boeing's 767 Tanker Deal a Boon to Ailing Line," *Associated Press Newswires*, May 23, 2003, 20:31

[82]See Teal Group Corp., "Boeing 767," *World Military and Civil Aircraft Briefing*, August, 2003.

[83] A recent New York Times article discussing the proposed Air Force arrangement estimates that the production of all models of the 767 could continue as late as 2011. This projection is based on the assumption that the initial lot of 100 tankers is ordered and delivered. In the face of no new commercial orders, a subsequent Air Force procurement would be needed to further delay a shutdown. See Leslie Wayne, "Air Force Lease With Boeing Seen Adding Billions to Cost," New York Times, August 27, 2003.

The Need to Help Boeing. Some critics have portrayed the leasing arrangement as somewhat of a financial boost for a company in difficulty,[84] and other analysts have speculated on the benefits of the number of jobs the construction and deployment of 100 new airplanes are likely to preserve and create.[85]

Boeing is the largest manufacturer in the U.S. aerospace industry, directly employing 166,000 workers and generating more than $54 billion in sales during 2002 that was split almost exactly in half between its two major divisions, Commercial Airplanes and Integrated Defense Systems. In addition, it provides work for many thousands of employees in companies that supply parts, components, and services to its operations. Boeing is ranked No. 15 in the most recent *Fortune* 500 and No. 104 in the *Financial Times Global 500* lists of corporations. It is included in both the Standard & Poor's 500 index and the Dow Jones industrials index.[86] In the civil aviation industry, Boeing has traditionally dominated world sales in large commercial jet aircraft, but is facing strong competition from rival Airbus. In the defense sector, Boeing and Lockheed Martin compete for the number one spot in world sales.

Perhaps because of the recent softening in general worldwide demand for commercial aircraft, Boeing recently restructured its corporate organization, moving its headquarters from the Seattle, Washington, area (where its principal commercial aircraft manufacturing facilities lie) to Chicago, and combined what had been its military aircraft and space and communications units into Integrated Defense Systems. One analyst has characterized this as a "controlled de-emphasis" of the company's traditional focus on commercial air transports in order to concentrate on areas such as satellite communications, space-imaging, flight services, and unmanned aerial and unmanned combat aerial vehicles (UAVs and UCAVs respectively).[87]

The impact of a 100-aircraft order on Boeing's Overall Production Output. The delivery of 100 new 767 Tankers to the United States Air Force over a six-year period would represent a relatively small addition to existing and

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[84]One news article quoted Sen. John McCain as stating, "This is a great deal for the Boeing Company that I'm sure is the envy of corporate lobbyists from one end of K Street to the other. But it's a lousy deal for the Air Force and the American taxpayer." See Leslie Wayne, "Unusual Pentagon-Boeing Deal Is Attacked," *New York Times*, June 10, 2003.

[85]See, for example, Marc Selinger, "Lawmakers Renew Push for Boeing to Build AF Tankers," *Aerospace Daily*, March 22, 2002; and Dan Voorhis, "767 Tanker Work Takes Off," *Wichita Eagle*, August 5, 2003, p. 1.

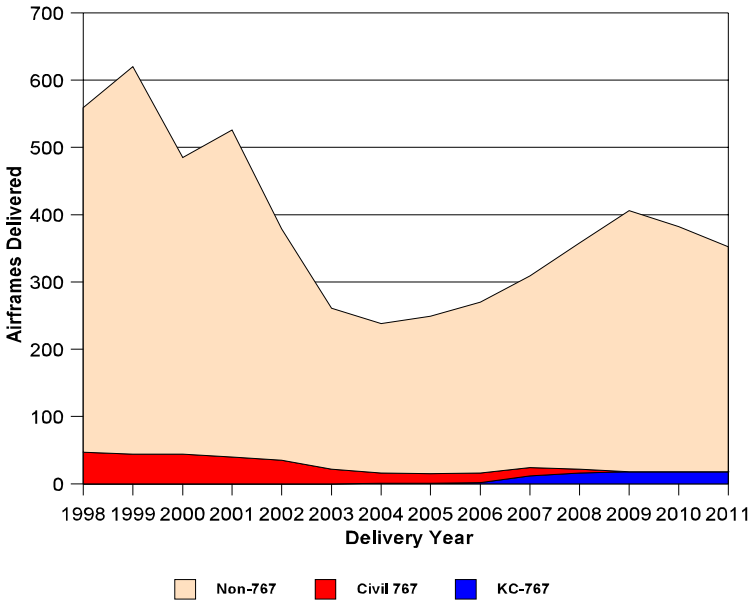
[86]*Hoover's Company Profiles*, August 1, 2003.

[87]*Ibid.* The communications satellite and launch services units within Integrated Defense Systems have recently faced difficulties of their own. Because of an incident involving the appearance at Boeing of competitor Lockheed Martin proprietary documents, the Air Force canceled or barred the company from competing for approximately $1 billion in military launch contracts. This came on top of unexpected commercial satellite launch cancellations due to the weakened space communications market. See Caroline Daniel, "Boeing Probe Gets To Grips With Ethics," *London Financial Times*, August 25, 2003; and Anne Marie Squeo, J. Lynn Lunsford and Andy Pasztor, "Boeing's Plan to Smooth Bumps of Jet Market Hits Turbulence," *Wall Street Journal*, August 25, 2003, p. 1.

anticipated production. However, some analysts expect the profit accruing to the company upon the sale of each 767 Tanker to exceed that of a comparable commercial jet, exerting a positive influence on corporate profits.

Boeing Commercial Airplanes delivered 379 aircraft of various models worth approximately $25 billion during 2002 (this was down from the 526 aircraft delivered during 2001). Of these 379 airframes, 35 were 767s. Figure 8 illustrates Boeing new aircraft deliveries from 1998 through 2002 and projects production through 2011[88] with 767 and KC-767 production highlighted.

Figure 8. Boeing Civil Airframe Production



Sources: Aerospace Industries Association (1998-2002; Teal Group (2003-2011)

Without the KC-767, Boeing will have built 5,308 civil aircraft during these fourteen years, including 293 767s. This represents 5.5% of the airframes manufactured. If 86 KC-767s are added (the remaining 14 are scheduled for 2012 delivery), the total 767 production accounts for 7.0% of Boeing production. Therefore, it appears that the KC-767 program is not critical to Boeing Commercial Aircraft, but is critical to one of the company's six existing civil aircraft assembly lines.[89]

A May 2003 report prepared by Morgan Stanley Research calculated and compared the expected profit of the sale of Boeing's KC-767 with other Boeing

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[88]Data are provided by the Aerospace Industries Association and Teal Group Corp. The projection is not carried through 2012, the last production year of the proposed KC-767 acquisition, because overall projection figures are not available for that year.

[89]The smallest of Boeing's commercial jet models, the 717, is expected to cease production in 2005.

commercial jet aircraft.[90] The report finds that the sale of each Boeing KC-767 under the conditions announced publicly by Boeing and the U.S. Air Force would generate approximately seven times the profit of a single Boeing 737, the company's most popular commercial airplane.

A comparison such as this is more valid if the KC-767 is compared with a commercial sale of the civil 767. If the assumptions published in the report are used to calculate and compare profits on the 767, it seems that the KC-767 may generate company profits equal to approximately three to four 767s. Table 3 illustrates how this number was generated.

Table 3. KC-767 and Civil 767 Profits

	KC-767		767
	Low	**High**	**Average**
Operating Profit Margin*	10.0%	15.0%	6.0%
Sale Price ($mil)**	138	138	82
Operating Profit/Aircraft ($mil)	13.8	20.7	4.9
Profit vs. 767***	280.5%	420.7%	100.0%

Data Source: Morgan Stanley
* Boeing has agreed to cap its operating profit margin at 15% of the converted tanker sale price.
** Boeing's advertized list price for the 767-200ER is $101.0-$112.0 million in 2002 dollars. The actual price of a given aircraft depends on the configuration and special features selected by the customer. Price quotes are available on the World Wide Web at [http://www.boeing.com/commercial/prices/]. Aircraft prices are negotiable, though, and airline customers can often win substantial discounts.
*** Profit calculation: CRS

The KC-767 as a Jobs Program. An order for 100 767 aircraft and their conversion to tanker configuration is likely to increase the number of workers that would otherwise be employed by Boeing's Commercial Airplanes unit and by the company's second-tier and below suppliers.[91] In an October 2002 letter to the White House Chief of Staff, Secretary of the Air Force James Roche quotes Boeing as estimating that the program would create 11,000 new jobs at Boeing itself and

[90]Heidi Wood, Aayush Sonthalia, and Myles A. Walton, *Does 767 Tanker Equate to 700+ Comml Orders?*, Morgan Stanley Research, May 29, 2003.

[91]Defense industry companies are traditionally divided into tiers. Prime contractors such as Boeing, Lockheed Martin, General Dynamics, etc., are referred to as first-tier companies. Companies that supply prime contractors with major subcomponents, such as aircraft engines, radar systems, etc., comprise the second tier. Companies lying further down the chain constitute third-and fourth-tier suppliers and below. See CRS Report RL30720, *The U.S. Defense Industrial Base: Trends and Current Issues*, by Daniel Else.

another 28,000 at its component makers, for a total of approximately 39,000 new positions.[92]

In order to gain an appreciation of what this means, it should be viewed in the context of Boeing's recent job losses, which have been significant since 1997 (See Figure 8). That year, the year after Boeing acquired McDonnell Douglas, the Commercial Airplanes unit employed more than 108,000 workers. This rose in 1998 to more than 117,500 as the company increased the pace of its jet deliveries. During 1999, however, Commercial Airplanes employment fell by more than 22,000, to 94,700, mirroring a slowdown in the deliveries of both single- and multi-aisle aircraft. Employment continued to decline through 2000 and 2001 until, at the end of that year, the unit employed 89,400, or more than 28,000 workers below the 1998 employment peak. Near the end of 2001, the company announced that the post-September 11 effect on the airline industry would require the layoff of approximately 30,000 workers.

By the end of 2002, Commercial Airplanes unit employment stood at 66,500 workers, a loss of 22,900 during the year and an overall loss of more than 59,000 jobs from the peak year of 1998. Using the same metric as above ($49,700 in annual wages per position, with approximately 2.5 supplier jobs linked to each Boeing job), this 5-year decrease in employment represents as much as $10.4 billion in wages in 209,000 jobs nationwide, and $2.9 billion in wages at Boeing, that have been either diverted to other employment within the aviation industry, moved to positions outside the aerospace sector, or eliminated.

If the 11,000 anticipated direct employment positions at Boeing's Commercial Airplanes unit had materialized during 2002, the limiting best case, they would have reinstated slightly less than half of the positions actually lost during that year. Figure 9 presents Boeing's Commercial Airplanes employment history in graphic form. The thick line on the right of the graph represents the addition of 11,000 hypothetical jobs during 2002.

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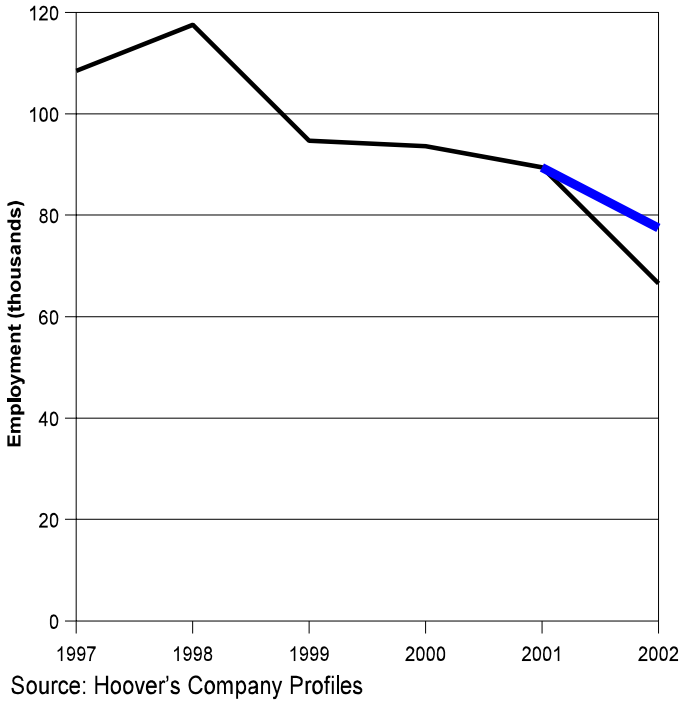
[92]At about the same time, Commercial Airplanes unit head Alan Mulally indicated that workers on the 767 at the Everett production site would face imminent layoffs due to the slow pace of 767 sales. The Seattle *Post-Intelligencer* estimated that approximately half of the 767 workforce would be cut. California would be expected to receive the greatest number of jobs, estimated at 9,200, from a 100-aircraft 767 tanker order. The states with large Boeing facilities, Washington and Kansas, could expect 8,000 and 4,400 jobs respectively. Other states with significant anticipated employment include Maryland (2,100 jobs), Connecticut (1,600 jobs), Texas (1,400 jobs), Michigan (1,400 jobs), Florida (1,000 jobs), and Arizona (1,000 jobs). The remaining 8,900 jobs would be spread over an additional 29 states. These projections were repeated in press reports. See James Wallace, "Boeing Plans Job Cuts On 767 Line," *Seattle Post-Intelligencer*, October 31, 2002 p. A1; and Helen Jung, "Boeing's 767 Tanker Deal a Boon to Ailing Line," *Associated Press Newswires*, May 23, 2003, 20:31.

Figure 9. Boeing Commercial Airplanes Direct Employment



Source: Hoover's Company Profiles

However, it is not clear whether all of these jobs will be new, or whether some might be transferred from the 747 production line, which is also facing difficulties. Should the 747 production line be shut down or its workforce cut back, this skilled labor would presumably be available for use on the 767 production line, potentially reducing the number of new or rehired workers.[93]

Total Costs for Leasing and Procuring the KC-767 [94]

If there is an urgent need to acquire tanker aircraft, and if tankers based on the Boeing 767 are the best aircraft to acquire, then a follow-on question is how the cost of acquiring these aircraft through a lease compares to the cost of acquiring them through a purchase (i.e., procurement).

Estimated Total Cost and Factors That Can Change The Calculation. The Air Force report presents estimates for the total cost of the leasing and procurement options that have been calculated on a net present value

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[93]In fact, at the end of 2002, Boeing reportedly considered combining 767 and 747 production into a single line. Boeing produces its larger aircraft, the 747, 767, and 777, at its plant in Everett, Washington, and its smaller 737 and 757 in nearby Renton. The 717 is built at a plant inherited from McDonnell Douglas in Long Beach, California. See James Wallace, "Boeing Looks At One Line For Two Models," *Seattle Post-Intelligencer*, December 20, 2002, p. A1.

[94]This section prepared by Ronald O'Rourke, Specialist in National Defense, Foreign Affairs, Defense, and Trade Division.

(NPV) basis (see Appendix B for a description of NPV analysis). The report states that when calculated on an NPV basis, leasing the 767s would be about $150 million, or about 1%, more expensive than purchasing (i.e., procuring) them. Specifically, the report states that leasing would have an NPV of $17.2 billion while purchasing would have an NPV of $17.1 billion. These two NPV figures are rounded to the nearest tenth of a billion. When the difference between them is measured more precisely, it becomes $150 million.[95]

Although the Air Force report presents this $150-million difference as a single answer to the question of the comparative total costs of leasing vs. purchasing the 767s, the cost comparison, as the report notes, can be significantly affected by decisions one makes on certain key variables or assumptions involved in the calculation. Included among these variables and assumptions are the following:

- Should a multi-year procurement (MYP) arrangement be used in calculating the cost of the procurement option?
- How much would using MYP arrangement reduce the cost of the procurement option?
- What is the correct discount rate to use in performing the NPV cost comparison?
- What progress payment schedule should be used in estimating the cost of the procurement option?
- How should inflation be used in calculating the cost of the progress payments under the procurement option?
- What interest rate should be used for the bonds floated by the Special Interest Entity (SPE)?
- What interest rate should be used on the construction loans that the SPE would take out under the leasing arrangement to finance the building of the 767s?
- What estimate should be used for the imputed government self-insurance cost included in the cost of the procurement option?

Each of these questions is discussed below. Several of these factors could individually shift the result of the NPV analysis by hundreds of millions of dollars. In combination with one another, they could shift the result by an even greater sum.

Use of MYP Arrangement For Procurement Option. In calculating the costs of the 767 leasing and procurement options, the Air Force assumed that the procurement option, like most major DOD acquisition programs, would use annual contracting. If the calculation had instead assumed the use of multi-year procurement

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[95] Air Force report, pages 4-5.

(MYP) for the procurement option (see Appendix C for a discussion of MYP), the NPV analysis could have favored the procurement option by several hundred million additional dollars.[96]

The Air Force states that it used annual contracting rather than MYP for the procurement option for the following reasons:

- MYP has never before been used at the start of a DOD aircraft procurement program.

- Using MYP at the start of a procurement program would not be consistent with the statutory requirement that weapons and platforms being considered for MYP have a stable design (i.e., a design that has been in production for several years and been proven through actual use, and is thus unlikely to need to be altered during the period covered by the MYP due to the discovery of design problems).

- Congress passed a provision authorizing a lease of 767s and did not pass a provision authorizing a multi-year procurement of 767s. If Congress had been open to considering an MYP arrangement for the 767s, it would have passed legislation granting such authority.[97]

Those who support the idea that the Air Force should have assumed the use of MYP in calculating the cost of the procurement option might argue the following:

- **The leasing arrangement approved by Congress inherently involves making a multi-year commitment to the 767 program**. Leasing opponents may maintain that since the leasing option is inherently a multi-year option, it should have been compared to a multi-year procurement option to ensure an apples-to-apples comparison of costs.

- **Supporters of the lease have argued that it constitutes an innovation in defense acquisition. Using MYP at the start of a 767 tanker procurement would equally represent an innovation.** Opponents may argue that although DOD has leased aircraft in the past, the 767 lease is precedent-setting in several regards, including the larger number of aircraft involved, the large total cost of the lease, and the use of a relatively short-term operating lease for

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[96]A footnote in the Air Force report (footnote 1 on page 4) can be read as implying that the use of MYP would by itself have enlarged the cost advantage of the procurement option from $150 million to as much as $1.9 billion on an NPV basis – a shift of as much as $1.75 billion. Discussions with the Air Force officials clarified that the use of MYP would have been responsible for about $900 million of this estimated shift, and that three other variables, if treated differently, together would have been responsible for shifting the calculation by roughly another $800 million. (One of these other variables – the inclusion of an imputed self-insurance cost in the cost of the procurement option – is discussed elsewhere in this CRS report.)

[97]The Air Force report states "that neither multi-year procurement authority, nor related funding authorities were made available and, therefore, was not a viable option for the Administration's analytical consideration." Air Force report, op cit, footnote 1 on page 4.

an asset that the Air Force will likely continue to require for a much longer period of time. In addition, the legislation setting up the lease exempted the Air Force from a requirement to include the full amount of funding that the government would be liable for in case of cancellation, and established a special congressional process for approving the lease. Leasing opponents may assert that Congress arguably sent a signal in passing the legislation setting up the lease that, in the case of the 767s, it is prepared to consider highly novel acquisition approaches. From their perspective, using MYP for the 767s would be no more irregular, and possibly less irregular, than the leasing arrangement. The fact that Congress approved one kind of authority (leasing) and not another (MYP) does not prove lack of congressional interest in approaches other than leasing. They might maintain that it is the role of Congress, not the Air Force, to decide what options Congress would be willing to consider.

- **There is precedent for Congress granting DOD a multi-year contracting authority similar to MYP at the start of a major DOD acquisition program involving a platform with a complex design:** Congress, in acting on the FY1998 defense budget, passed a provision granting the Navy a special block-buy contracting authority for the first four Virginia-class nuclear-powered attack submarines. This authority was similar to MYP authority in that it permitted the Navy to sign a single contract covering 4 submarines that were to be procured over the 5-year period FY1998-FY2002. These 4 submarines have a combined estimated procurement cost of more than $10 billion. In terms of design and engineering, nuclear-powered submarines are at least as complex, if not more complex, than tanker aircraft, and Congress passed this legislation in 1997, before construction of the first Virginia-class submarine had even started.

- **There is precedent for a service requesting MYP authority for a program that has not yet produced a single completed unit and consequently has not demonstrated design stability through the traditional means of successfully testing one or more fully built units in their intended operating environment:** The Navy, as part of its FY2004 budget submission, requested that Congress grant full MYP authority for a group of 7 Virginia-class submarines to be procured during the 5-year period FY2004-FY2008. The Navy requested this authority even though construction of the first Virginia-class boat is still not complete. (It was about 85% complete at the time the Navy submitted its proposed FY2004 budget to Congress in February 2003.) Instead of demonstrating the stability of the Virginia-class design in the traditional manner – by completing construction of at least one boat and showing, through real-world operations, that the boat's design does not need to be changed to fix previously undiscovered design problems – the Navy is advancing the novel argument that the relatively small number of design changes that have occurred during the lead ship's construction (compared to the number of design changes that occurred during construction of the lead ships of previous classes of U.S. submarines) is sufficient to demonstrate that the Virginia-class design is stable.

- **There is precedent for a service assuming the use of a precedent-setting MYP in a major defense acquisition program when making an important cost calculation that was forwarded to Congress:** In estimating projected cost growth in the Virginia-class program – a projection that the Navy forwarded to Congress – the Navy this year assumed the use of MYP in the Virginia-class program for FY2004-FY2008. The Navy made this assumption even though Congress has not yet approved the MYP arrangement for the Virginia class, and even though approving it would set a precedent because the first boat has not yet been completed, let alone tested. If the Navy had not assumed the use of MYP in its cost calculation, the projected amount of cost growth in the program would have been substantially higher, and would have triggered the Nunn-McCurdy provision (10 USC 2433), a law under which a defense program reporting more than 25 percent projected unit cost growth is to be terminated unless the Secretary of Defense submits to Congress certain certifications about the program's importance and management.

- **There is precedent for a service requesting MYP authority for an air-vehicle program that has not demonstrated design stability through the traditional means of completing testing and having multiple production copies completed and in the operational inventory:** The Navy, as part of its FY2004 budget submission, requested that Congress grant MYP authority for 1,748 Tactical (Block IV) Tomahawk cruise missiles to be procured during the 5-year period FY2004-FY2008. The Tactical Tomahawk is a reengineered (redesigned) version of the older Tomahawk cruise missile (the Block I through Block III version) that ended procurement in FY1999. The Tactical Tomahawk was reengineered to be built at roughly half the cost of the older Tomahawk and differs in many ways from the older Tomahawk at the piece-part level. The first Tactical Tomahawks meant for operational use were procured in FY2002. Construction of these missiles is to begin at the subcontractor level in 2003, and assembly of the missiles is scheduled for 2004. The Navy requested an MYP arrangement for the Tactical Tomahawk program even though testing of the Tactical Tomahawk is still underway, and even though the first production missiles procured in FY2002 have not yet been completed, are being built following a two-year (FY2000-FY2001) interruption in procurement of new-built Tomahawks, and are not scheduled to enter the operational inventory until May 2004. In addition, a DOD decision on whether the Tactical Tomahawk program is ready to proceed to full-rate production is not to be made until May or June 2004.[98]

- **The 767 tanker will have as much, if not more, design stability than the Virginia-class submarine or Tactical Tomahawk cruise missile.** The 767

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[98]The developmental phase of testing, which included four test flights, began in August 2002 and was completed on July 20, 2003. The follow-on operational phase of testing is to include another four test flights. The initial low-rate production contract for the weapon was awarded in October 2002. Manufacturing at the subcontractor level was to begin in 2003, and missile assembly is to begin in 2004. (Sources: U.S. General Accounting Office. *Defense Acquisitions[:] Assessments of Major Weapon Programs*. Washington, 2003. (May 2003, GAO-03-476) p. 61; Hodge, Nathan. Tactical Tomahawk On Track: Navy. *Defense Week*, July 28, 2003: 3.)

tanker design is based on the airframe for the Boeing 767 commercial airliner. Boeing has considerable experience building this airframe: It delivered the first 767 airliner in 1982 and has delivered a total of 908 through June 2003. The equipment that is to be added to the basic 767 airframe to convert the plane into a tanker is not new technology. And the task of integrating these components into the basic 767 design will be done to sell the 767 tanker design to the governments of Italy and Japan, which are in line to acquire four 767 tankers each before 767 tankers are to be delivered to the Air Force.

- **The start of the MYP arrangement could in any event be delayed until sometime after the start of the procurement option.** As noted in the August 26, 2003, Congressional Budget Office (CBO) report on the 767 lease proposal, Congress in any event could wait until the third 767 production lot (i.e., the 21st plane) to grant MYP authority, and use the first two production lots (totaling 20 planes) to demonstrate design stability in the program. Such an option, CBO stated, would still capture roughly 80% of the cost-reduction benefits of using MYP for the procurement option.[99]

Air Force officials have stated that the issue of whether to assume MYP in the procurement option is in any event moot, because the Air Force budget is insufficient over the next few years to meet the near-term funding requirements of a 767 procurement program without requiring undue reductions in other Air Force programs. Indeed, they could argue that using MYP would require even more near-term funding than an annually contracted procurement program, due to the need to fund the MYP's economic order quantity (EOQ) purchase (i.e., up-front batch order) of selected 767 tanker components.[100]

Those who believe that an MYP arrangement should be used in calculating the cost of the procurement option could argue that the issue is not necessarily moot, because it is possible to structure a 767 tanker procurement option using MYP that features reduced near-term funding requirements. Specifically, they could argue, the Air Force could procure the 767s under an approach that combined MYP, incremental funding, and possibly a delayed EOQ purchase or no EOQ purchase at all. Such an approach, they could argue, would (through MYP) reduce the total procurement cost of the 767s below what the Air Force estimated in its report and defer (through incremental funding) portions of the procurement cost of the 767s into future years, so as to address the Air Force's requirement to minimize near-term funding requirements.

Deferring the EOQ purchase (and thereby applying it only to later planes in the 100-plane effort, rather than to all 100 aircraft) would reduce the amount of savings achieved through the MYP (since EOQ purchases are a significant contributor to overall MYP savings), but it would also defer the funding requirements of the EOQ to a later year and reduce the scope and cost of the EOQ when it does occur,

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[99]U.S. Congressional Budget Office. *Assessment of the Air Force's Plan to Acquire 100 Boeing Tanker Aircraft*. Washington, 2003. p. 14 (With cover letter dated August 26, 2003)

[100]For more explanation of EOQ payments, see Appendix C.

addressing the Air Force's need to minimize near-term funding requirements. Completely eliminating the EOQ purchase would further reduce the savings achieved by the MYP, but still permit some MYP-related savings to be achieved (through work force optimization and investment in improved production equipment at the final assembly plant) while eliminating the EOQ purchase as a possible source of near-term funding pressure.

Opponents of an incrementally funded MYP could argue that it would not only set a precedent by using MYP at the start of an aircraft procurement program, but also violate the full funding policy governing defense procurement. In acting on the FY2003 budget request, they can argue, Congress altered the Air Force's proposed funding profile for the C-17 program and passed other legislation specifically to reinforce the principal that procurement programs using MYP are no less subject to the full funding policy than annually contracted programs.[101]

Supporters of an incrementally funded MYP with a delayed or eliminated EOQ purchase could argue that although Congress, in acting on the FY2003 budget, reinforced the application of the full funding policy to MYP programs, this was intended to send a general signal on defense budgeting procedures that need not apply to the 767 program because Congress, in passing the legislation setting up the 767 lease, indicated that, in the case of the 767s, it was prepared to consider highly novel and irregular acquisition approaches. An incrementally funded MYP with a delayed or eliminated EOQ purchase, they could argue, would be no more irregular, and possibly less irregular, than the leasing arrangement. Supporters of the lease have argued that it constitutes an innovation in defense acquisition. Supporters of an incrementally funded MYP could argue that it, too, would represent an innovation. As recent precedents for the use of incremental funding in a major DOD acquisition program, they could cite the following examples:

- Congress, in the FY2000 and FY2001 defense appropriation bills, directed the Navy to use incremental funding to procure an amphibious assault ship called LHD-8 – a relatively expensive ($2.0 billion) ship that, if fully funded in a single year, could have required reductions in other Navy programs that year.

- The Navy, through use of advanced procurement funding in FY2001-FY2006 and so-called split funding in FY2007-FY2008, plans to procure a new aircraft carrier called CVN-21 in FY2007 using a funding profile that amounts to a form of incremental funding, even though this ship is nominally subject to the full funding provision. CVN-21 is a very expensive ($8.6 billion) ship that, if fully funded in a single year, could require significant reductions in other Navy programs that year.

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[101]For a discussion of the full funding policy and Congress' action on the FY2003 budget in connection with the C-17 aircraft program, see CRS Report RL31404, *Defense Procurement: Full Funding Policy – Background, Issues, and Options for Congress*, by Ronald O'Rourke and Stephen Daggett. Washington, 2002. (Updated November 22, 2002) p. 7-8, 17-21.

- DOD in the 1990s in effect used a form of incremental funding to acquire military sealift ships called Large, Medium-Speed, Roll-on/Roll-off ships (LMSRs) that were procured through the National Defense Sealift Fund (NDSF). The NDSF is a DOD revolving fund that is not subject to the full funding provision because it is outside the procurement title of the DOD appropriation act. Future ships procured through the NDSF, including Navy Lewis and Clark (TAKE-1) class auxiliary cargo ships, could be built using a similar funding approach.

Supporters of an incrementally funded MYP for the 767s could argue that procurement of 767s, if necessary, could be moved to a DOD budget account that is outside the procurement title of the defense appropriations act and therefore not subject to the full funding policy. Past congressional action, they could argue, establishes some precedent for this: As part of its action on the FY2001 defense appropriation bill (H.R. 4576/S. 2593), Congress established a National Defense Airlift Fund (NDAF) – a revolving fund outside the procurement title of the DOD appropriations act that was analogous to the NDSF – and directed that C-17 airlift aircraft be procured through this fund rather than in the Air Force's aircraft procurement account.[102] Although Congress directed that C-17 procurement in the NDAF conform to the full funding policy, supporters of an incrementally funded MYP for the 767s could argue that Congress, in passing the legislation setting up the 767 lease, signaled that, in the case of the 767s, it was prepared to consider new approaches, such as incremental funding.

Amount of Savings From Using MYP In Procurement Option. The Air Force's estimate that using MYP for the procurement option would reduce the cost of the procurement option by about $900 million on an NPV basis was derived by reducing the estimated cost of the procurement option by 7.4%. The 7.4% figure was taken from a 2001 report from the RAND Corporation that examined the estimated savings of 12 previous actual or proposed uses of MYP in DOD procurement programs.[103] The 7.4% figure was an average obtained by excluding the highest and lowest estimated savings rates in the programs examined (more than 14.3% for the Army Javelin anti-tank missile and 3.9%-4.7% for the Air Force F-22 fighter, respectively). Including these two cases would produce an estimated savings rate of 7.7%. The remaining 10 cases varied between 5.4% and 10%.

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[102]The NDAF was established by report language on the FY2001 defense appropriations bill (H.R. 4576/S. 2593. (See pages 136-137 of the Senate Appropriations Committee's report [S.Rept. 106-298 of May 18, 2000] on S. 2593 and page 284 of the conference report [H.Rept. 106-754 of July 17, 2000] on H.R. 4576.) The NDAF was disestablished as part of Congress' action on H.R. 3338, the FY2002 defense appropriations bill (see page 261 of the House Appropriations Committee's report on H.R. 3338 [H.Rept. 107-298 of November 19, 2001]), and procurement of C-17s reverted to the Air Force's aircraft procurement account.

[103]Lorell, Mark A., and John C. Graser. *An Overview Of Acquisition Reform Cost Savings Estimates*. RAND Corporation, 2001. (MR-1329-AF) 142 p. MYP is discussed in Chapter 6 of the report.

If applying MYP to the 767 procurement option produce savings of as little as 5.4% or as much as 10%, then MYP might reduce the cost of the procurement option on an NPV basis by as little as about $660 million (using the 5.4% figure) or as much as about $1.2 billion (using the 10% figure). Using a delayed (and thus reduced) EOQ, or no EOQ at all, would result in a smaller amount of cost reduction.

Discount Rate Used in NPV Analysis. OMB circular A-94 provides guidance to executive branch agencies on what discount rates to use in calculating the NPVs of leasing and purchasing options. These rates are based on the yields (i.e., interest rates) on U.S. Treasury notes and bonds of specified maturities. As set forth in the most recent (January 2003) version of Circular A-94, those rates are as follows:

Table 4. Discount Rates for Lease-vs.-Purchase NPV Comparisons

(Appendix C, OMB Circular A-94, revised January 2003)

Discount Rate	Maturity Periods				
	3-year	5-year	7-year	10-year	30-year
Nominal	3.1%	3.6%	3.9%	4.2%	5.1%
Real	1.6%	1.9%	2.2%	2.5%	3.2%

Section 8(c) of Circular A-94 further instructs agencies, in choosing a discount rate, to use "the Treasury borrowing rate on marketable securities of comparable maturity to the period of analysis." In selecting a rate to use from the table above, OMB and the Air Force considered at least three alternatives that might qualify as being "of comparable maturity to the period of analysis" – a 6-year rate (which would cover the 6-year lease period for each aircraft), a 9-year rate (which would cover both the 3-year construction period and 6-year lease period for each aircraft) and a 15-year rate (which would span the entire period from the start of construction of the first aircraft through the end of the lease of the 100th aircraft). OMB and the Air Force settled on using a 9-year rate, which was then calculated by interpolating between the 7-year and 10-year rates shown on the above table.[104]

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[104]In response to questions submitted by CRS, the Air Force stated the following regarding the selection of the 9-year discount rate:

QUESTION: Please explain the two-step discount rate shown in the slide on the financial analysis of a lease vs. purchase. Was that option rejected by the lease panel and if so, why?

ANSWER: The two-step was developed to inject analytical consistency into the analysis and to resolve analytical differences between the Air Force and OMB. It was developed and then rejected. Initially, the OMB noted that the planned leases for this program involved six years of lease payments. Therefore, it was appropriate to consider the use of a six-year discount rate in this analysis. However, the Air Force noted that actual lease payments would not start until 2006 and would continue as leased aircraft are delivered through 2011.

(continued...)

Was a 9-year Treasury bond rate the correct rate to use as the discount rate in the NPV calculation?[105] CRS analysis indicates that a different Treasury bond rate should have been used. Specifically, CRS analysis indicates that the NPV calculation should use the Treasury bond rate for bonds having an *average* maturity equal to the bonds that the U.S. government would likely use to raise the funds needed for the cash flows involved in the lease arrangement. In the case of the 767 lease, CRS calculates this average maturity at something between 3.5 and 4 years.[106] Using a 4-year discount rate instead of the 9-year rate in the Air Force report would

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[104](...continued)
The issue was how to calculate the present value of the lease payments since the lease involved different key dates – the date of the contract and the various dates from 2006 through 2011 when the aircraft were to be delivered. The two-step discounting took this variety of dates into account. The process involved: 1) The first step was to discount each of the respective lease streams back to the year of lease option using the OMB forecasted treasury yields for the year of lease. Similarly, the stream of lease payments starting with the 2007 lease option would be discounted to 2007 using the forecasted yield on treasuries in 2007, and so on; 2) The values from step 1 would then need to be further discounted to the contract award date. The lease panel decided not to use this approach because it was unconventional. Our understanding is that they did not want to diverge too far from existing policy on discounting. It should be noted however, that OMB acknowledged that existing guidance was not set up to handle such a complex lease versus buy analysis[.]

QUESTION: Please explain the rationale for selecting a nine-year discount rate.

ANSWER: The nine-year discount method was the result of the resolution of the consideration of the two-step discounting process. OMB guidance clearly stated that the discount rate should be used that is commensurate with the period of analysis. However, the Air Force's period of analysis was 15 years from the start of the contract until the last lease payment is made. OMB decided that a 9-year discount rate was appropriate in that it matches the 6 years for a given lease plus three years of construction for a given plane. By agreeing to the nine-year discount rate, OMB agreed that the Air Force did not have to use the 6-year discount rate while the Air Force agreed to eliminate the 2-step discount approach or the 15-year discount rate. Again, the nine-year discount rate is based on the assumption that there is a 3-year tanker construction period plus a 6-year lease.

(Source: Questions 9 and 10 from Air Force Fact sheet dated August 13, 2003 and sent to CRS on that date responding to CRS questions on the 767 tanker lease.)

[105]The paragraph and the following one are based on consultations with Jane Gravelle, Senior Specialist in Economic Policy, Government and Finance Division, Congressional Research Service.

[106]This is a rough calculation based on the following assumptions: A 3-year construction period, a 15/30/30/25 progress payment schedule during construction, 6 equal lease payments paid in advance of each year equating to about 90% of the cost of the aircraft, and a final residual payment at the end of the sixth year to pay off the remaining 10% cost of the plane. (A 15/30/30/25 progress payment schedule means that the government would make progress payments to Boeing for the construction of each aircraft on the following schedule: 15% three years before delivery, 30% two years before delivery, another 30% one year before delivery, and 25% at delivery. This is the progress payment schedule used by the Air Force in its cost comparison.) This rough calculation ignores a compounding issue that would not significantly alter the outcome of the calculation.

favor the procurement option by an additional $520 million.[107] Using a 3.5-year rate instead of the 9-year rate would favor the procurement option by an additional $610 million.[108]

It is possible that the interest rates shown in Table 5, particularly the rates for the shorter-term bonds, are too low. The Congressional Budget Office is projecting 10-year government borrowing rates that are higher than those shown in Table 5[109] Using higher interest rates than shown in Table 5, particularly for shorter-term bonds (such as a bonds with a 3.5- or 4-year maturity) would by itself favor the leasing arrangement by some additional amount of money. If government borrowing rates shift up from the rates shown in Table 5, however, corporate borrowing rates would likely also shift up, offsetting some portion (possibly all) of the relative advantage gained by the leasing option of assuming an upward shift in Treasury bond rates.

Progress Payment Schedule For Procurement Option. In estimating the cost of the procurement option, the Air Force report used a 15/30/30/25 progress payment schedule, meaning that the Air Force under the procurement option would provide Boeing progress payments during the construction of each aircraft (or group of aircraft) as follows: 15% of the cost of the aircraft three years prior to delivery, 30% two years prior to delivery, another 30% one year prior to delivery, and 25% at delivery. The Air Force states that it used the 15/30/30/25 schedule in modeling the cost of the procurement option because this is the schedule that has been used in discussions of the lease option under which Boeing would draw on the SPE's bank line of credit (i.e., the construction loan) to finance the construction of the planes for sale to the SPE. Using this same schedule for modeling the progress payments under the procurement option, Air Force officials argue, ensures a more apples-to-apples cost comparison.

An alternative view is that regardless of the line of credit draw-down schedule that was used in discussing the lease option, the procurement option should be modeled using a progress payment schedule that reflects actual progress payment schedules used in previous Air Force aircraft procurement programs involving aircraft built over a 3-year construction period. An example of such a schedule, based on part programs, would be 10/24.5/43.5/22. This alternative schedule has been referred to by some observers as a "compressed" schedule. Others, however, might view it as a traditional or typical schedule for a procurement program involving aircraft that take 3 years to build. Compared to the 15/30/30/25 progress payment schedule, this alternative schedule would shift a portion of the progress payments into later years, with the result that they would be discounted more heavily, reducing the NPV of the procurement option. The Air Force states that using this alternative progress payment schedule for the procurement option would favor the procurement option by an additional $200 million.

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[107]This figure is a rounded off version of the result ($521.8 million) provided by the Air Force cost model.

[108]This figure is a rounded off version of the result ($612.7 million) provided by the Air Force cost model.

[109]For CBO's projected interest rates on 10-year Treasury bonds, see [http://www.cbo.gov/showdoc.cfm?index=4032&sequence=11].

Treatment Of Inflation In Progress Payments For Procurement Option. In estimating the cost of the procurement option, the Air Force calculated each progress payment to include an amount of inflation that would result as if all four progress payments for a given aircraft (or groups of aircraft) were made at the time of delivery, even though three of the progress payments would actually be made in earlier years. The Air Forces states that it calculated the progress payments for the procurement option this way because this was the same basis for calculating the lease cost of the aircraft under the lease option. Using this same method, Air Force officials argue, ensures a more apples-to-apples cost comparison.

An alternative view is that procurement programs in the past have calculated progress payments in one of two ways – by including inflation through the year of delivery on all the payments, as described above, or by including an amount of inflation on each progress payment sufficient to cover inflation up to the point in time when each payment is made. The Air Force states that using the second method would favor the procurement option by an additional $500 million.

Interest Rates For Bonds Floated By SPE. Comparing the costs of the leasing and procurement options involves making an assumption, for the leasing option, about the interest rates of the bonds that would be floated by the Special Purpose Entity (SPE) to raise the cash needed to purchase the 767s from Boeing. The higher (or lower) these interest rates are, the higher (or lower) the lease payments would need to be to cover the SPE's borrowing costs, and thus the higher (or lower) the total cost of the lease option.

Under the proposed approach for implementing the 767 lease, the SPE would float three kinds of bonds called G bonds, A bonds, and B bonds. These bonds would present different amounts of risk for the bondholders and would thus carry different interest rates.

In the Air Force report, the assumed interest rate for the G bonds was derived by taking the January 2003 OMB forecast for 5-year Treasury Bonds and then increasing it by 56 basis points (i.e., 56 hundredths of a percentage point).[110] The result was that the interest rates for the G bonds were assumed to be 5.70%-5.91% during the period FY2006-FY20011 (the period during which the bonds would be floated).

The assumed interest rate for the A bonds was derived by taking the January 2003 OMB forecast for 2-year Treasury bonds and then increasing them by 100 basis points (i.e., a full percentage point). The result was that the interest rates for the A bonds were assumed to be 5.84%-6.04% during the period FY2006-FY2011.

The assumed interest rate for the B bonds was based on expected (i.e., forecasted) rates for high-yield corporate bonds, which resulted in a 10% interest rate for the period FY2006-FY2011.

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[110]A basis point is 1/100th of a percentage point. An interest rate of 5.01%, for example, is 1 basis point higher than an interest rate of 5.00%

The actual interest rates for all these bonds will not be known until the SPE actually floats them in the bond market. These actual rates could be higher or lower than the rates assumed in the Air Force report. If the actual rates turn out to be higher (or lower) than assumed in the Air Force report, then the cost of the lease will be higher (or lower) than shown in the Air Force report.

As a means of illustrating the sensitivity of the NPV cost calculation to any difference between the assumed and actual interest rates for the SPE bonds, it can be noted that if the actual interest rates for all three kinds of bonds turn out to be 50 basis points higher (or lower) than assumed in the Air Force report, then the total cost of the lease, when calculated on an NPV basis, would be about $270 million higher (or lower) than the cost shown in the Air Force report.[111] This figure of about $270 million can be used as a rough yardstick for estimating changes in the cost of the lease resulting from a difference between assumed and actual rates that is different than 50 basis points.[112]

Potential questions for Congress arising out of the issue of the assumed SPE interest rates include the following:

- What was the analytical basis for the approach that was used in the Air Force report to derive the estimated interest rates for the SPE bonds? Was this approach reasonable? What other approaches might have been used to estimate these interest rates?

- Given changes in various economic factors since January 2003, including projected federal borrowing needs, what is the likelihood that the interest rates forecasted by OMB in January 2003 will turn out to be higher or lower than actual rates?

- Historically, in situations where similar estimates had to be made about future bond interest rates, how much of a difference did there turn out to be between projected and actual interest rates, and was the difference more likely to be in one direction than another?

Interest Rates for Construction Loans Taken Out By SPE. Comparing the costs of the leasing and procurement options also involves making an assumption, for the leasing option, about the interest rates of the construction loans that the SPE would take out from banks to finance the construction of the 767s prior to Boeing selling them to the SPE. The higher (or lower) these interest rates are, the higher (or lower) would be the construction-financing cost that is included in lease price for each airplane, and thus the higher (or lower) the lease payments would need to be to cover the lease cost of the airplanes.

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[111]Source: Based on Air Force calculations of 50- and 150-basis-point changes in interest rates provided to CRS, August 22, 2003.

[112]The figure of more than $200 million for a 50-basis point difference between assumed and actual rates does not scale up and down in a precisely linear fashion, but the difference is small enough that the 50-basis-point figure can be used for making rough estimates of the change resulting from differences greater or lesser than 50 basis points.

The Air Force report assumes that the SPE will be able to borrow money for 767 construction loans at an interest rate that would result in an average of $7.4 million in construction-financing costs for each plane. This $7.4-million cost is added into the lease price of each 767, bringing the average lease price to $138.4 million per plane.

The actual interest rates for the construction loans will not be known until Boeing takes out these loans. These actual rates could be higher or lower than the rates assumed in the Air Force report. If the actual rates turn out to be higher (or lower) than assumed in the Air Force report, then the cost of the lease will be higher (or lower) than shown in the Air Force report.

As a means of illustrating the sensitivity of the NPV cost calculation to any difference between the assumed and actual interest rates for the construction loans, it can be noted that if the actual interest rates turn out to be 50 basis points higher (or lower) than assumed in the Air Force report, then the total cost of the lease, when calculated on an NPV basis, might be several tens of millions of dollars higher (or lower) than the cost shown in the Air Force report.[113] This potential degree of change can be used as a rough yardstick for estimating changes in the cost of the lease resulting from a difference between assumed and actual rates that is different than 50 basis points.

Inclusion of Imputed Self-Insurance Cost in Procurement Option. The total cost of the 767 lease option includes a cost for private insurance policies that the SPE would take out to protect bondholders against events such as the accidental crash and loss of one or more of the 767s. In the event of such a loss, the proceeds from the insurance policy would be used to pay off the bondholders.

If the 767s were procured rather than leased, no such insurance policy would be taken out by the government. Instead, the government would simply bear the risk of such a loss (i.e., employ self-insurance). Bearing this risk incurs no immediate additional cost to the government. OMB Circular A-94, however, instructs agencies, when comparing the costs of leasing and purchasing options, to include in the cost of the procurement option an imputed (i.e., synthetic or virtual) self-insurance cost. OMB Circular A-94 instructs agencies to include such a cost because there is a risk that one or more of the 767s would be lost during their years of operation, and the government, in the case of the procurement option, would have to bear the cost of such a loss either operationally (due to the reduced capacity of the remaining 767 fleet) or financially (due to the need to spend additional funds to procure replacement aircraft). For this reason, OMB believes, including an imputed self-insurance cost ensures a more apples-to-apples comparison of costs between leasing and purchasing options.

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[113]Source: CRS rough order-of-magnitude (ROM) estimate based on the contribution of the construction-financing costs ($7.4 million) to the average total price of each aircraft ($138.4 million), a rough proportional relationship between the $138.4-million figure and the total net present value of the lease, and the approximate amount of change that might occur in the $7.4-million figure as a result of a 50-basis-point change in the interest rate of a bank line of credit that is drawn down over a 3-year construction period to finance the construction of a 767.

The cost comparison in the Air Force report, as instructed by Circular A-94, includes an imputed self-insurance cost for the procurement option. The Air Force report estimates this cost at $100 million on an NPV basis.

The question is whether $100 million figure is a reasonable estimate of the government's self-insurance cost. The government's self-insurance cost would likely be lower than the cost of private insurance, since the cost of private insurance includes, among other things, a profit for the insurance company. The government's self-insurance cost would also likely be greater than zero, since there is a risk greater than zero of losing one or more of the 767s during their years of operation. Beyond these two bounding observations, however, calculating the cost of self-insurance poses methodological uncertainties that could lead to results either higher or lower than $100 million on an NPV basis. If alternative estimates put the cost of self-insurance at something higher than $100 million, this would make the cost comparison more favorable to lease option. If they put it at something lower than $100 million, thus would make the comparison more favorable to the procurement option.

The table immediately below summarizes the potential effect of the above variables and assumptions on the outcome of the cost comparison.

Table 5. Summary of Variables, Assumptions, and Potential Changes in NPV Cost Calculation

Variable or assumption	Treatment in Air Force report	Potential alternative treatment	Potential change in NPV calculation resulting from alternative treatment of that one variable or assumption
Use MYP for the procurement option?	No	Yes	Could favor procurement option by several hundred million additional dollars (see next item)
How much savings would result from using MYP for the procurement option?	7.4% – about $900 million in NPV	Anywhere from 5.4% to 10% – or less, if economic order quantity (EOQ) is delayed or not used	MYP might reduce the cost of the procurement option by as little as $660 million (5.4%) or as much as $1.2 billion (10%), respectively, in NPV (rather than $900 million as stated in the Air Force report). Delaying or eliminating the EOQ would result in a smaller amount of cost reduction.
Discount rate used for NPV analysis	9-year Treasury bill rate from OMB Circular A-94	3.5- or 4-year Treasury bill rate from OMB Circular A-94	Could favor procurement option by an additional $520 million dollars (4-year rate) to $610 million dollars (3.5-year rate)
Progress payment schedule for procurement option	15/30/30/25 schedule used, reflecting draw-down rate for lease	10/24.5/43.5/22 schedule used, reflecting past Air Force procurement programs	Could favor procurement option by an additional $200 million.
Treatment of inflation in progress payments for procurement option	Include inflation through year of delivery for all payments	Include inflation through point in time for each payment	Could favor procurement option by an additional $500 million

Variable or assumption	Treatment in Air Force report	Potential alternative treatment	Potential change in NPV calculation resulting from alternative treatment of that one variable or assumption
Interest rates for bonds floated by SPE	Based on OMB forecasts of certain market rates	Actual rates could turn out to be higher or lower	If the actual rates are higher (or lower) than the forecasted rate, the lease would be more (or less) expensive than shown in the Air Force report. A half-point (i.e., 50-basis-point) difference between the forecasted and actual rates could shift the NPV of the lease option by about $270 million.
Interest rates for SPE construction loans	Current projected corporate borrowing rates	Actual rates could turn out to be higher or lower	If the actual rates are higher (or lower) than the forecasted rate, the lease would be more (or less) expensive than shown in the Air Force analysis. Each half-point (i.e., 50-basis-point) difference between the forecasted and actual rates might shift the NPV of the lease option by several tens of millions of dollars.
Imputed self-insurance cost	Estimated at $100 million	Other estimates could be higher or lower	Could favor leasing (if higher) or procurement (if lower).

Source: Congressional Research Service.

Congressional Oversight and Budgetary Issues[114]

A final set of questions addresses implications of the tanker lease for Congressional oversight of defense programs and long-term budget plans. If all four congressional committees approve the $3 million new start notification submitted to Congress on July 11th, the Air Force will sign a contract with Boeing Aircraft that will commit the Air Force to a $24.6 billion program over the next fifteen years.

The Air Force and others argue that the lease is attractive because it allows the Air Force to acquire 100 tanker aircraft with relatively little money spent up front.[115]

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[114] This section was written by Amy Belasco; Specialist in Defense Budget; Foreign Affairs, Defense, and Trade Division.

[115] In the cover letter to the Air Force report, "Report to the Congressional Defense (continued...)

On the other hand, the proposed lease appears to be, in many ways, an unprecedented method of undertaking a major new defense procurement and is at odds with longstanding laws and regulations that apply to budgeting and procurement of defense systems. The proposed tanker lease raises a number of broader policy issues, particularly, the visibility of full cost of planned defense programs in the Congressional oversight process. The chief issues raised are the following.

- **Locking in substantial budgetary resources when long-term budgets are uncertain.** If Congress approves the new start notification, the Air Force will make a contractual commitment that "locks-in" an estimated $24.6 billion or more between 2003 and 2017 for the Boeing tanker lease. These funds have not been included in the Air Force budget. And while the lease approach reduces Air Force budget requirements in the short-term, it does so only by pushing costs out into future years when potentially necessary trade-offs with other defense programs are less visible to policy makers but may be no less difficult.

- **Locking in funding when program costs are uncertain.** By proposing to lease rather than purchase the aircraft, the Air Force adds considerable uncertainty to the cost of the program that might not be experienced in a straight purchase. In this proposed lease, the Air Force would make itself subject to the volatility of the bond markets. Because of the high cost of termination liabilities, the Air Force would be unlikely to cancel the lease even if financing costs increased substantially. The total cost of the program is also likely to be higher because, according to many observers, the Air Force is likely to purchase the aircraft at the end of each six-year lease.

- **Does the proposed lease comply with the statutory requirements and OMB rules for operating leases?** Some observers have questioned whether the K767 tanker proposal is appropriately categorized as an operating lease. Budget rules provide that payments for operating leases are to be counted or scored in agency budgets on an annual basis as payments are made. If the tanker deal is categorized as a capital lease, then OMB would require that DOD budget $11.6 billion up front to cover the full cost of the lease in present value terms.[116] Those rules are designed to ensure that the full scope of the government's obligations are visible to policymakers in order to foster cost-effective decisions.

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[115](...continued)
Committees on KC-767A Air Refueling Aircraft Multi-Year Lease Pilot Program," July 10, 2003, Secretary of the Air Force James Roche states "The dominant reason for proposing the lease is the advantage it affords for quickly delivering needed tankers to our warfighters without requiring significant upfront funding."

[116]OMB, Circular A-11,Appendix B-1, "Scoring Lease-Purchase and Leases of Capital Assets." OMB revised this circular in July 2003 but the Air Force lease was subject to the 2002 version. Differences between the two versions are identified in the new circular. Estimate of full cost of lease in net present value dollars is from Air Force model.

- **Use of a Special Purpose Entity decreases visibility**. The Air Force plan to rely on a Special Purpose Entity (SPE) or Variable Interest Entity (VIE) to float the bonds to finance the program creates additional uncertainties and reduces visibility about likely cost. Some observers have suggested that using an SPE also masks the financial commitment of the government because the full government liability is not scored or counted in terms of budgetary resources.

- **Is the proposed lease a good deal for the government?** The dollar value of the proposed lease is predicated on covering 90% of the "fair market value" of the aircraft in order to minimize the amount of funding that would be considered risky - and hence command a larger premium - by bondholders. That pricing does not reflect either the length of the lease or the wear and tear on the aircraft. Some have also questioned whether the "fair market value" of the aircraft is the best price for a tanker particularly since the Air Force negotiated both the lease and support contract without competition.

- **Deviation from full-funding of the government's contractual liability.** The statutory language applying to the multi year tanker lease exempts the Air Force from the requirement to budget for its potential termination liability, i.e. penalty payments for cancellation of the contract. Congress has thus exempted this Air Force action from the longstanding Anti-Deficiency Act which requires that government agencies have resources on hand to cover the government's contractual liabilities.

The following discussion analyzes each of these issues in turn. The previous section compares costs of various program options using net present value or discounted dollars in order to capture the effects on costs of different funding streams. The section below compares costs in current year dollars because that is the way program costs are generally expressed and how budget choices are generally made. Unless stated otherwise, all figures in this section are in current year dollars and convert Air Force numbers from outlays to budget authority.)[117]

Locking in Substantial Resources When Long-term Budgets Are Uncertain. Locking in the tanker lease program over the next 15 years could squeeze other programs. Although the Air Force has included some future funding for a new undefined tanker in DOD's planning documents and hopes to reap savings from retiring 68 old KC135Es, those funds are not sufficient to fund the proposed lease. There is also some Congressional opposition to the proposed retirements, which could reduce resources further if included in the final version of the FY2004 DOD Authorization Act.[118] Based on a recent CBO report, budgetary pressures on all Air Force programs could be substantial beyond 2008 at the same point as lease

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[117]Estimates of current dollar costs in this report are based on either the Air Force model, which was provided to CRS by the Air Force, or Air Force responses to CRS questions.

[118]*S. Rept. 108-46*, National Defense Authorization Act for FY2004, p. 294; the Senate report would restrict retirements to 12 rather than 68 retirements. The House version does not address this issue.

payments would grow substantially (see Table 6).[119] If total defense spending grows only modestly in later years as is predicted in the FY2004 budget resolution, Air Force choices could be still more difficult.

Implications of Air Force Decision To Opt For A Lease Over A Buy. According to Air Force figures, the total program cost of the proposed lease is $24.6 billion compared to $20.7 billion for a non-multi-year buy in current dollars. The lease is $3.9 billion or 19% more expensive than a non-multi year buy (see Table 6 below).[120] Both options include over $8 billion in support costs. Since support costs are comparable, the more valid comparison may be between the lease payments and the non-multiyear buy. In that case, the lease would be more than 30% more costly.[121]

Although the Air Force acknowledges that the lease is more expensive, the Air Force contends that resources are not available to fund a buy in the next several years because of other program demands. Table 6 shows that from FY2003 through FY2009, only $5.5 billion would be required for the lease compared to $17.0 billion for a non-multiyear buy. On the other hand, the budgetary pressures would simply be transferred to later years. From FY2009 to FY2017, the lease would require $19.9 billion compared to $3.7 billion for the non-multiyear buy.

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[119]CBO, *The Long-term Implications of Current Defense Plans: Summary Update for Fiscal Year 2004*, July 2003, Figure 5.

[120]To make the options comparable, the Air Force compares a case where the Air Force leases and then returns the planes for sale by the Trust to a case where the Air Force buys and then sells the planes on a commercial market.

[121]See also, Air Force, Briefing to CRS, "KC767A Report to Congress, Status Brief," July 15, 2003.

Table 6. Comparison Of Lease vs. Buy Options For The Tanker Lease Program Using Air Force Assumptions

in billions of current year dollars

Program Option	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY03 - FY09	FY10 - FY17	FY03 - FY17	Diff. in percent
Total Program Cost[a]																				
Lease	0.0	0.0	0.1	0.1	0.5	0.8	1.7	2.2	2.9	3.5	3.6	3.2	2.7	2.1	1.2	0.6	**5.5**	**19.9**	**24.6**	
Non-Multiyear Buy	0.0	0.1	1.1	2.0	2.9	3.5	3.9	3.4	2.6	1.7	0.7	0.1	-0.1	-0.2	-0.5	-0.5	**17.0**	**3.7**	**20.7**	
Lease vs. Buy	0.0	-0.1	-0.9	-1.9	-2.5	-2.7	-2.3	-1.2	0.3	1.9	2.9	3.1	2.8	2.3	1.7	1.1	**-11.5**	**16.2**	**3.9**	**18.7%**
Support Costs[b]																				
Lease	0.0	0.0	0.1	0.1	0.4	0.4	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.8	0.5	0.5	**2.4**	**5.9**	**8.3**	
Non-Multiyear Buy	0.0	0.0	0.1	0.1	0.4	0.4	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.8	0.8	0.5	**2.4**	**6.2**	**8.6**	
Lease vs. Buy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	-0.1	-0.3	0.0	**0.0**	**-0.3**	**-0.3**	**-3.2%**
Lease payments vs. Non-MYP Buy																				
Lease	0.0	0.0	0.0	0.0	0.1	0.5	1.0	1.6	2.2	2.8	2.8	2.3	1.8	1.3	0.7	0.1	**3.1**	**13.9**	**17.1**	
Non-Multiyear Buy	0.0	0.1	0.9	1.9	2.5	3.1	3.3	2.8	1.8	0.9	-0.1	-0.7	-1.0	-1.1	-1.3	-1.0	**14.6**	**-2.5**	**12.1**	
Lease vs. Buy	0.0	-0.1	-0.9	-1.9	-2.4	-2.7	-2.2	-1.2	0.3	1.9	2.9	3.1	2.8	2.3	2.0	1.1	**-11.5**	**16.5**	**4.1**	**34.2%**

Sources: CRS Calculations based on Air Force Model, Business Case Analysis Model 1, July 2003.

Notes:

[a] Assumes lease and return of planes to Trust to be sold; for comparability, assumes purchase and then sale of aircraft. Includes cost of leasing or buying aircraft and support costs for operating, maintaining and training on aircraft, aircraft insurance for potential damage. Program total includes a proposed rebate, estimated by the Air Force at $800 million, that it would receive at the end of the lease assuming the sale price of aircraft exceeded outstanding loans to bondholders. Negative numbers reflect sales or lease rebates. That rebate is not included in the individual lease and support costs.

[b] Includes other government support and contract costs.

Future Budget Pressures On The Air Force May Increase. A recent CBO report that estimates long-term costs of the current program suggests that the Air Force's investment programs are likely to continue a sharp upward path in the years beyond 2009 reflecting the demands on the budget of buys of the F/A-22 new fighter aircraft, the Joint Strike Fighter, increases in intelligence and command-and-control as well as a tanker lease and subsequent buy. In later years, pressure may grow on the Air Force budget because of investment in a successor to the B-2 long-range bomber and a replacement of the Minuteman intercontinental missile. CBO projects that Air Force investment would have to grow from $58 billion in 2009 to an average of $64 billion annually between 2010 and 2020 in 2004 dollars if all planned Air Force programs are funded.[122]

Funding such increases could be difficult unless the defense budget continues to grow substantially. The FY2004 budget resolution, however, projects that increases for defense will drop from $20 billion per year to less than $10 billion beginning in FY 2009.[123] If this path materializes, DOD would face substantial pressures to make trade offs between defense programs. Such choices could be more difficult with the resources for the lease program off-limits.

While estimates of future defense spending could, of course, change, over the long-term, pressures to hold defense spending down could re-surface starting around the end of the decade with the retirement of the baby boom generation. If the tanker lease is approved, some observers have predicted that operating leases could be used more widely. That could, in turn, lock in large amounts of future budget resources and reduce congressional choices and oversight.

Locking in Resources When Program Costs Are Uncertain. The Air Force's current $24.6 billion estimate for total program costs could prove unrealistic for several reasons. Even if costs grow, however, the Air Force is unlikely to cancel the program.

Air Force Is Likely To Purchase the Plane. Although current Air Force plans do not envision purchase of the aircraft and the Air Force would have to request funds from Congress, many observers believe that a purchase is likely. The Air Force would continue to need the plane, particularly if they retire 68 older KC-135s as planned, and the plane would have a useful life of another twenty years or more after the lease is complete. And with all but 10% of the "fair market value" of the aircraft already paid for, few would question that a purchase would be a good deal unless the aircraft performed poorly. A purchase of all 100 planes would cost an additional $4.4 billion raising total program cost from $24.6 billion to $29 billion.

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[122]See Figure 5 and discussion in CBO, *The Long-Term Implications of Current Defense Plans: Summary Update for Fiscal Year 2004*, July 2003, p. 12; see also, CBO, *The Long-Term Implications of Current Defense Plans*, January 2003, pp. 72-87. This CBO estimate includes a tanker lease followed by a buy and a second tanker lease.

[123]H.Rept. 108-71, *Conference Report on Concurrent Resolution on the Budget for Fiscal Year 2004*, p. 42. In real terms, the FY2004 budget resolution projects that total spending on national defense will begin to decline in real terms starting in FY2008. By 2012, the resolution projects that defense spending would be $427.2 billion compared to $438.8 billion in FY20l7 or a decline in real terms of 2.6%.

The structure of the operating lease makes it likely that the Air Force would choose to buy the planes, which could reduce the risk faced by the "B" tranche bondholders who are financing the final 10% of the cost to be paid off when the planes are ultimately sold.

Changes in Interest Rates Could Change Program Costs Significantly. According to the Air Force's analysis, the total cost of the multiyear lease itself is about $17.1 billion in current dollars, excluding $8.3 billion for support costs.[124] Of that total, about $3.9 billion, or about 19%of the lease total represents financing costs (see Table7 below).[125] When the bonds are floated starting in 2006, those costs could change in response to economic circumstances, prospects for the defense budget, or programmatic developments.

Based on information provided by the Air Force, Table 7 shows how shifts in interest costs of plus or minus .5% and 1.5% for all three tranches would affect financing and total costs. If interest rates proved to be .5% higher or lower than anticipated by the Air Force, the cost of the lease would rise by $400 million in current year dollars. A sharper change of 1.5% from current assumptions would increase or decrease the cost of a lease by $1.4 billion in current year dollars.

Table 7. How Interest Rates Change 767 Tanker Lease Program Costs

in billions of current year dollars[a]

Change in Interest Rates	In billions of dollars			Financing As Percent of Lease Cost
	Lease Costs[b]	Change in Cost	Interest Cost	
AF assumptions	$21.5	NA	$4.0	18.4%
Plus .5% interest	$21.5	$.4	$4.4	20.1%
Plus 1.5% interest	$22.9	$1.4	$5.3	23.4%
Minus .5% interest	$21.9	$-.4	$3.5	16.6%
Minus 1.5% interest	$20.2	$-1.3	$2.7	13.3%

Notes:

[a] All costs are in current dollars which include the effects of inflation.

[a] Based on comparisons to the Air Force's baseline case, a non-multiyear buy.

Sources: From sensitivity runs of Air Force Model, August 2003.

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[124]Table 6 includes in its total of $16.3 billion an estimate of rebate costs if the Air Force returned the aircraft and the Trust sold them at more than the outstanding loan.

[125]CRS calculated interest costs as a share of lease costs rather than total program costs because support costs are not affected by financing charges.

By obligating the government to cover the cost of financing the aircraft, the Air Force subjects itself to the volatility of the bond market between 2006 and 2011, which would not be the case in a purchase. The Air Force would also have a *contractual* commitment to the entire program as well as substantial penalties for termination.

Compliance of Lease With Statute and Regulations Is An Issue. Some observers have questioned whether the proposed lease complies with the statutory language in Section 8159 of the FY2002 DOD Appropriations Act, P.L 107-117. That language requires that the lease be consistent with OMB Circular A-11 which establishes the criteria that distinguish operating leases from capital leases.

Appropriateness of Using An Operating Lease. Operating leases are generally intended to be used when an asset is needed for only a limited period of time and the user does not need or intend to purchase the asset. If the business or agency needs the asset on a long-term basis, however, then a purchase generally makes more economic sense.

To guard against agencies using operating leases to "buy on the installment plan," or incrementally fund a purchase, the government has adopted a series of guidelines for analyzing the trade-offs and for accurately reflecting the cost to the government. Both CBO and OMB follow the same guidelines, which reflect the 1997 Budget Enforcement Act.[126]

Much of the debate about the proposed Air Force tanker deal has focused on the appropriateness of using an operating lease rather than a straight buy. If the tanker deal were scored or counted as a *capital* lease rather than operating lease, under current budget rules, the Air Force would be required to provide $11.6 billion in budgetary authority (BA) upfront to reflect those costs.[127] That rule is designed to ensure that government policymakers are fully aware of the full cost when decisions are made.

The Air Force believes that the tanker deal, as currently structured, is consistent with the budgetary guidelines.[128] The issue of whether the tanker proposal meets the criteria for an operating lease has been disputed within the Administration and Congress since passage of the 2002 leasing authority.

Criteria For Operating Leases. To qualify as an operating lease, OMB Circular A-11 requires that a lease must fulfill the following six criteria:

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[126]CBO, *The Budgetary Treatment of Leases and Public/Private Ventures* by Deborah Clay-Mendez, (February 2003), p. 8 and Box 3; see also, OMB Circular A-11, *Preparation, Submission, and Execution of the Budget,* Circular No. A-11 (2003).

[127]OMB's budget rules require that the budgetary resources for capital leases or lease purchases reflect the entire cost of the lease over its lifetime, measured in present value terms, and that the agency budget for that amount.

[128] Air Force briefing to CRS, "KC-767A Report to Congress, Status Brief, July 15, 2003."

(1) Ownership of the asset remains with the lessor during the term of the lease and is not transferred to the government at or shortly after the end of the lease term;
(2) The lease does not contain a bargain-basement price purchase option;
(3) The lease term does not exceed 75% of the estimated economic life of the asset;
(4) The present value of the minimum lease payments over the life of the lease does not exceed 90 % of the fair market value of the asset at the beginning of the lease term;
(5) The asset is a general-purpose asset rather than being for a special purpose of the government and is not built to the unique specification of the government as lessee; and
(6) There is a private-sector market for the asset.[129]

These criteria are designed to ensure that federal agencies are not using operating leases with the ultimate intent of buying the asset once the lease is over. Similarly, the 75% cap on the length of the lease and the 90% cap on the fair market value of the asset are intended to stop agencies from leasing assets which they need for a long time and therefore would be better off buying. Finally, the last two criteria limit operating leases to items which are not peculiar to the government and have a commercial market because the government is more likely to get a reasonable price for assets which could also be leased or sold elsewhere.

Congressional Intent About The Tanker Deal. Although the statutory language for the tanker deal in DOD's 2002 Appropriation Act does not *explicitly* authorize an "operating lease," the language requires that the Air Force "accept delivery of the aircraft in a general purpose configuration," and return the aircraft to the lessor "in the same configuration." The act also does *not* authorize purchase of the aircraft. These are all OMB criteria that distinguish an operating lease.[130]

The lease is also *not* to include modification of this commercial configuration "unless and until separate authority for such conversion is enacted," and budget authority is provided.[131] This language is designed so that a tanker lease would comply with OMB's criteria that the system be a "general purpose asset."

In its report language, the Senate Appropriations Committee signaled its intent that the authority was to be used for an operating lease.[132] The conference committee simply notes that the statutory language was expanded in conference.[133] In addition,

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[129]OMB Circular A-11, *Preparation, Submission, and Execution of the Budget, Circular No. A-11* (2003), Appendix B.

[130]See Section 8117 in P.L. 107-248 and H.Rept. 107-732, Conference Report on H.R. 5010, *FY2003 DOD Appropriations Act*, p. 116.

[131] See Section 8117 in P.L. 107-248 and H.Rept. 107-732, Conference Report on H.R. 5010, *FY2003 DOD Appropriations Act*, p. 116.

[132]*H.Rept. 107-109*, p. 163.

[133]*H.Rept. 107-117*, p. 403.

in a colloquy with Senator Inouye about the 767 lease, Senator Murray asked Senator Inouye whether

> a general purpose aircraft that will meet the general requirements of many customers; that can operate as a passenger aircraft, a freighter, a passenger/freighter "combination" aircraft, or as an aerial refueling tanker; and is available to either government or private customers meets the definition of a general purpose, commercial configured aircraft?[134]

Senator Inouye agreed with this characterization, which implies that even if the Air Force modified the Boeing 767 to make it an air refueling aircraft, a military use, the aircraft could still be considered "commercial" item as required for operating leases. In support of this characterization, Senator Roberts noted that both Italy and Japan have purchased modified 767 aircraft as tanker aircraft.[135] Although a colloquy on the floor is an indication of Congressional intent, it does not carry the same force as language included in a conference or committee report, which reflects the views of the authorizing or appropriating committee.

Disputes About Whether The Tanker Deal Is An Operating Lease. Within both the Administration and Congress, some have questioned whether the proposed lease complies with OMB's criteria for an operating lease. Below is a summary of the chief arguments made on both sides.[136]

(1)Whether ownership will be transferred to the government shortly after the end of the lease.

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- The Air Force would say that the Special Purpose Entity, Wilmington Trust, owns the asset if and until the Air Force makes a decision about whether to buy the aircraft. The lease calls for return of the aircraft after six years although the Air Force would be permitted to buy the planes at any time if it gets authorization and appropriation of funds.

- Others have pointed out that even though the Special Purpose Entity technically owns the plane, that entity only exists as a conduit for the Air Force. Under revised OMB regulations issued in July 2003 - after completion of the tanker proposal - Wilmington Trust would be considered a "governmental" rather than a private entity.[137] Others have noted that the contract permits the government to buy the aircraft at any point during the lease and that the lease price makes purchase of the aircraft after the lease attractive because the Air Force will already have paid 90% of the fair market value, and will have a continuing need for the aircraft. The Air Force Report to Congress also notes that DOD is committed to "earmark an additional $2

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[134]*Congressional Record*, p. S13845, December 20, 2001.

[135]*Congressional Record*, p. S13845, December 20, 2001.

[136]Air Force positions are based on Air Force briefing to CRS, "KC-767A Report to Congress, Status Brief, July 15, 2003."

[137]See OMB Circular A-11, *Preparation, Submission, and Execution of the Budget, Circular No. A-121* (2003), Appendix B-7.

billion in FY08 and FY09 for the purchase of aircraft covered by the multi-year pilot program."[138]

(2) The lease does not include a bargain-price purchase option.

- The lease permits the Air Force to purchase the aircraft for $44 million per aircraft, the remaining balance of the loan to the bond holders, or 10% of the fair market value.
- The Air Force estimates that the aircraft could be sold as freighters for about $51 million per aircraft at the end of the lease, a price that is about 15% higher than the Air Force will pay.

(3) The lease does not exceed 75% of the economic life of the asset.

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- The six-year lease constitutes one-quarter of the estimated 25 year life of the aircraft.

(4) The present value of the lease payments does not exceed 90% of the fair market value of the aircraft.

- The Air Force argues that its payments are 89.9% of the initial fair market value of the KC-767 tanker based on a per plane price of $138 million in 2002 dollars.
- In its report to Congress, the Air Force acknowledges that the lease payments would be 93% of the fair market value, thus breaching the threshold, if the Air Force used the $131 million (2002$) price for the aircraft, which excludes construction financing as part of the price.[139] Some would not consider those financing costs to be part of the value of the aircraft since they would not be part of the government's purchase price.[140]

(5) The asset must be general purpose rather than built to government specifications.

- The Air Force notes that the 767 was commercially developed, and that other customers have added as much as 35% "customer specific" equipment.
- Critics would argue that the tanker configuration in the lease is unlikely to be used by many other customers, and is therefore not a commercial aircraft. The fact that the Air Force version of the aircraft is priced substantially higher than the cost of a freighter version suggests substantial government modifications although Air Force estimates do not include monies to 'de-convert' the aircraft.

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[138]U.S. Air Force, *Report to the Congressional Defense Committees on KC-767A Air Refueling Aircraft Multi-Year Lease Pilot Program*, July 10, 2003, p. A2-1.

[139]U.S. Air Force, *Report to the Congressional Defense Committees on KC-767A Air Refueling Aircraft Multi-Year Lease Pilot Program*, July 10, 2003, p. 7.

[140]If the Air Force bought the aircraft, it would provide financing in progress payments that reimburse the contractor for ongoing expenses.

(6) Asset must have a private sector market.

- The Air Force argues that Italy and Japan have already bought tankers and suggest that there is a potential market in as many as 25 countries as well as commercial buyers (e.g. Fed Ex, UPS).
- In its current configuration, critics suggest that the commercial market is small and that there would not be customers for 100 aircraft, and that at the Air Force cost of about $165 million per aircraft - substantially higher than the $60 million cost of a commercial 767 - there would be few takers.

Implications of Using A Special Purpose Entity. The Air Force's reliance on a special purpose entity (SPE) has raised questions about whether the total cost and financial risks to the government may be obscured leaving decision makers less able to make cost-effective decisions. Budget scoring rules - as expressed in OMB Circular A-11 and the 1997 Budget Enforcement Act - did not anticipate government use of SPEs, and reliance on SPEs makes it easier for agencies to argue that the full costs of a program should not be considered as government liabilities even when there is no real distinction between the trust and the government. In the case of Wilmington Trust, the government is the sole beneficiary, making it essentially an "extension of the government" according to CBO's definition.[141]

In the case of the tanker lease, this lack of distinction is captured by the fact that Wilmington Trust is a non-profit entity that bears no risk but instead, acts essentially as a conduit for funds between Boeing, the Air Force, and the bondholders. Through its contractual commitment to the Trust, the government shoulders the financing risks, including most of the risk of cancellation of the lease. The bondholders would bear a portion of the risk of termination of the lease and the full risk that the Air Force would not buy the planes at the end of each lease.

Concerns With Precedents. The Air Force use of an SPE for this lease raises additional concerns because it may strengthen the trend in which federal agencies use SPEs to budget off-line, and not show or record the full cost of obligations of the government. Budget rules are ambiguous about how to identify government liabilities in public/private ventures. In its February 2003 report, CBO describes several cases in which federal agencies launched programs without "scoring" or counting the full scope of the government's liabilities. For example, CBO estimates that DOD has used public/private ventures to obtain about $2.3 billion in military housing while recording $255 million in obligations, almost a ten to one ratio.

In the case of the tanker lease, the ratio would be even more dramatic assuming that the lease is scored as an operating lease. OMB has not taken an official position on whether the lease should be scored as an operating or a capital lease.

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[141]CBO, *The Budgetary Treatment of Leases and Public/Private Ventures* by Debbie Clay-Mendez, (February 2003), p. 5; see also p. xiii and Chapter 3.

Oversight Mechanisms For SPEs . In reaction to the tanker lease, as well as increasing use of SPEs by government agencies, OMB recently revised its scoring rules in OMB Circular A-11. Issued in July 2003, the revised rules specify that in any public/private partnership where the government benefits by leasing back the asset, the arrangement would be considered a capital lease and the net present value of all lease payments scored up front. Unless there is substantial private participation in the SPE, its transactions are to be scored as governmental.[142] If these new rules had been in effect, the Air Force tanker lease would probably have been considered a capital lease.

Some might consider that scorekeeping rules might not ensure that the budgetary and financial implications of leases were fully considered by decision makers. Based on current rules, CBO scores leases when legislation is being considered and OMB scores leases upon enactment or when the government makes a contractual commitment. CBO has proposed that all leases be authorized individually.[143] In the tanker lease legislation, the Air Force had two ways to get approval of the proposal - with authorization and appropriation language or a new start notification. The Air Force chose the latter simpler route.

Questions About Whether The Proposed Lease Is A Good Deal for the Government. Some observers have questioned whether the lease is a good deal for the government - as a lease or as a way to acquire tankers. GAO and others have raised concerns about the lack of competition for both the lease and the support cost package. To meet concerns within the Administration, the Institute for Defense Analysis was commissioned to assess the price.

Air Force's Lease Price Is Higher Than Commercial Rates. On July 24, 2003, John Plueger, CEO of International Leases Finance Corporation, a large, company that leases 600 jet aircraft to about 160 airlines worldwide, testified to the House Armed Services Committee about how commercial leases work. In light of today's oversupply of commercial aircraft, John Plueger suggested that a lease of 100 wide-body aircraft like the 767, particularly to the U.S. government, "the most creditworthy buyer" would "certainly command the highest concession levels offered by any aircraft manufacturer for commercial/civilian airliners."[144]

Mr. Plueger suggested that commercial lease rates on new widebody aircraft like the 767 generally range from about five-tenths to eight tenths of a percentage point per month times the cost of the aircraft.[145] If that rate were applied to the Air Force's

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[142]See OMB Circular A-11, *Preparation, Submission, and Execution of the Budget, Circular No. A-121* (2003), Appendix B-7.

[143]CBO, *The Budgetary Treatment of Leases and Public/Private Ventures* by Deborah Clay-Mendez, (February 2003), p. 57 to p. 58.

[144]Prepared statement of John Plueger to House Armed Services Committee, July 23, 2003, p7 and p. 8.

[145]Prepared statement of John Plueger, President and Chief Operating Officer of International Lease Finance Corporation, presented to hearing before House Armed Services (continued...)

estimated fair market value of the 767 tanker - an average of about $165 million in current dollars - the cost of the Air Force lease would range from $59 million to $95 million per aircraft per six-year lease, or about 35% to 57% of its value. The Air Force is planning to pay about 90% of the aircraft's market value, or about 40% to 60% more than suggested by the commercial formula.[146]

In a competitive market, why would the Air Force negotiate a lease at 90% of the value of the aircraft for a lease that would use the aircraft for less than one-quarter of its useful life? According to the Air Force, the lease price was negotiated in order to minimize the amount of the loan that would need to be repaid to bondholders at the end of the lease. That decision, in turn, was designed to limit the amount of funds that would be loaned at the highest rate, estimated to be 10% (a junk bond rate), to cover the risk that the Air Force would *not* buy the plane at the end of the lease.

Instead of negotiating the lease price to reflect the usage - either the length of time or the amount of hours flown - the Air Force negotiated the price to minimize financing costs and to make it easier for the Air Force to find resources to buy the aircraft at the end of the lease.

Proposed Cancellation Payments. The proposed contract for the lease includes substantial penalties for cancelling the lease, which could make it difficult for the Air Force to cancel. According to the proposed contract, the Air Force would be liable to make a "special payment" or penalty charges of an additional year's lease costs in case of cancellation. At the height of the lease, those payments would be about $2.7 billion (see Table 8). In addition, the Air Force would be liable for unamortized costs incurred by the contractor on aircraft that were planned to be built but where Boeing had not yet started construction. The Air Force has not estimated those costs.[147]

Table 8. Estimated Air Force Termination Liabilities, 2003-2017

in billions of current year dollars

Year/ Payment	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Penalty payments[a]	.05	.48	1.01	1.58	2.16	2.76	2.77	2.35	1.83	1.26	.68	.12

Notes:
[a]The Air Force would also be responsible for unamortized costs associated with the remaining aircraft out of the 100 in the lease that had not yet been built; the Air Force has not estimated the size of these potential costs.
Sources: Air Force Model and CRS calculations.

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[145](...continued)
Committee, July 23, 2003, p. 10.

[146]CRS calculations based on Air Force Briefing, for cost of lease ($27.7 million per plane per year) and Plueger formula in testimony.

[147]Boeing has estimated these costs but the figures are proprietary. Boeing would complete aircraft under construction and deliver them to Wilmington Trust, who would then sell the aircraft. Proceeds from those sales would go to the bondholders in the "A" and "B" tranches.

Is The Lease A Good Deal Compared To A Multiyear Buy? As discussed previously, some would argue that the cost of the proposed multiyear lease should be compared to a multiyear buy to set up a "level playing field." In its report to Congress, the Air Force acknowledged that on this basis, the gap would widen between the cost of the lease and a buy in terms in both present value and current dollars.

As discussed previously, other changes in other assumptions that would affect the comparison of costs made in the Air Force analysis were debated within the Administration, including:

- whether to assume a progress payment rate closer to standard rates for Air Force aircraft programs rather than the rates desired by Boeing;
- whether to compute inflation based on progress payments rather than compounded to the amount experienced at the time when the entire set of aircraft was completed as the Air Force assumed; and
- whether to decrease the government's imputed cost of insurance below commercial rates to reflect lower risk.

If these assumptions are changed, the gap between the cost of the lease compared to a multiyear grows from $3.9 billion to $5.7 billion in current dollars (see Table 9). Hence, by opting for a lease, the Air Force would be agreeing to pay a premium of from 19% to 27% more in order to have the convenience of paying lower amounts in earlier years.

If the Air Force were to spend the lease dollars on aircraft rather than exploiting the lease in order to pay less in earlier years, those additional dollars could purchase about 35 more tankers.[148]

Table 9. Cost of Lease vs. Multiyear Buy and Alternate Assumptions

(in billions of dollars/percent difference)

Cost of Air Force Lease Option	Cost of Non-Multiyear Buy with Air Force Assumptions	Cost of Multiyear Buy with Alternate Assumptions	Non Multiyear Buy vs. Lease with Air Force assumptions		Multiyear Buy vs. Lease with Alternate Assumptions	
			$ in Billions	% Diff.	$ in Billions	% Diff.
$21.1	$17.2	$15.4	- $3.9	- 19%	- $5.7	-27%

Notes: This table compares the cost of the lease payments and a subsequent purchase of the aircraft to a multiyear purchase with lower inflation, insurance, and progress payments. It excludes support costs, which would not be affected by the options.

Source: CRS calculations based on Air Force Model, July 1,2003.

[148]CRS calculation assuming that the price for the aircraft would be $162 million in current year dollars, the same as the last 20 in the 100 lot buy.

Deviation From Full Funding. Under Section 8159 of P.L. 107-117,which sets up the special rules for the tanker lease, the Air Force is exempted from the requirement to budget for potential termination liabilities.[149] This exemption is a significant departure from the longstanding government policy to provide full-funding of potential government liabilities in order to ensure compliance with the Anti-Deficiency Act, a law dating back to 1861.[150] That law prohibits any government employee from authorizing government spending unless there are sufficient appropriations to pay the government's contractual obligations. The Air Force considered providing the substantial funding for termination liability too difficult, and Congress authorized an exemption.

Section 8159 permits the Air Force to include special payments for cancellation of up to one year's additional lease payments. The proposed contract for the tanker lease adopts that cancellation schedule (see Table 8 above). Under this contract clause, the Air Force would be liable for termination payments that could be more than $2.7 billion at the high point of the lease in 2011 without having funds in its budget. In 2003, Congress provided that the Air Force could draw on appropriations for operations and maintenance or for procurement to make those payments.[151] This language parallels the special exemption from funding termination liabilities that is provided for multi-year procurement.

Comparison To Statutory Requirements For Multiyear Procurement. Like the proposed long-term tanker lease, a multiyear procurement also represents a long-term commitment by the government over a period of years, and is also exempted from funding termination liability. DOD's multi-year programs, however, are required to meet a set of criteria set out in statute, to get specific authorization, and DOD must certify that budgetary resources have been set aside for the program.[152] These strict rules are designed to ensure that the loss of budgetary flexibility and the exemption from the funding termination liability are offset by the benefits to the government.

For DOD's multiyear programs, Congress established the following conditions:

- the program results in substantial savings;
- the requirement, funding, and design are stable;
- the cost estimates are realistic; and

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[149]Section 8159 (b), P.L. 107-117, *FY2002 DOD Appropriations Act*. This section exempts the Air Force from Title 10, Section 2401, which requires budgeting of funds for termination liabilities in long-term leases, specific authorization of leases, and various reporting requirements.

[150]*U.S. Code, Title 31,* Section 1341. For history of full-funding policy, see CRS Report RL31404, *Defense Procurement: Full Funding Policy - Background, Issues, and Options for Congress,* by Ronald O'Rourke and Stephen Daggett, November 21, 2002.

[151]See addition of paragraph (g) to Section 8159, P.L. 107-117, *FY 2002 DOD Appropriations Act* that was enacted in Section 8117 in P.L. 107-248, *FY2003 DOD Appropriations Act*.

[152]See *U.S. Code,* Title 10, Chapter 137, Section 2306 b.

- the Secretary of Defense certifies that funds have been set aside in future years.[153]

These criteria are designed to ensure that programmatic risks are low and DOD achieves significant savings that offset the loss of flexibility of a long-term commitment.

Because multi-year procurements must also be specifically authorized, these criteria are considered during the normal budgetary review. In addition, DOD generally provides funds for the annual portion of the contract as well as additional investment to increase the overall efficiency of the production. DOD must certify that resources have been included in future years.

In the case of the tanker lease, Congress provided special authorities for the tanker lease and exempted the Air Force from the requirement to budget for termination liability with the following requirements:

- the Air Force must submit a report that outlines the terms and conditions of the proposed contract and "expected savings, if any," between a lease and a purchase as well as annual reports thereafter;
- a contract cannot be signed until at least 30 calendar days have elapsed since submission of the report;
- the present value of the total payments of the lease cannot exceed 90 percent of the fair market value of the aircraft as required by OMB Circular A-11;
- the Air Force must accept delivery and return aircraft in a commercial configuration; and
- aircraft cannot be modified unless special authority is provided in an appropriations act or the aircraft is transferred to the Air Force, which requires separate authorization.[154]

Under these requirements, the benefits to the government from locking in resources and shouldering additional financial risk are less clear.

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[153]See *U.S. Code*, Title 10, Chapter 137, Section 2306 b (a) and (i).

[154]See Section 1859 (c) (6) through (10), *P.L. 107-117*

Appendix A. The Law Authorizing the Lease

Statutory authority for the Air Force to lease 100 767 tankers (and also 4 Boeing 737 transport aircraft) was provided in Section 8159 of the FY2002 DoD appropriations act (P.L. 107-117 of January 10, 2002), which states:

> SEC. 8159. MULTI-YEAR AIRCRAFT LEASE PILOT PROGRAM. (a) The Secretary of the Air Force may, from funds provided in this Act or any future appropriations Act, establish and make payments on a multi-year pilot program for leasing general purpose Boeing 767 aircraft and Boeing 737 aircraft in commercial configuration.
>
> (b) Sections 2401 and 2401a of title 10, United States Code, shall not apply to any aircraft lease authorized by this section.
>
> (c) Under the aircraft lease Pilot Program authorized by this section:
>
> (1) The Secretary may include terms and conditions in lease agreements that are customary in aircraft leases by a non-Government lessor to a non-Government lessee, but only those that are not inconsistent with any of the terms and conditions mandated herein.
>
> (2) The term of any individual lease agreement into which the Secretary enters under this section shall not exceed 10 years, inclusive of any options to renew or extend the initial lease term.
>
> (3) The Secretary may provide for special payments in a lessor if the Secretary terminates or cancels the lease prior to the expiration of its term. Such special payments shall not exceed an amount equal to the value of 1 year's lease payment under the lease.
>
> (4) Subchapter IV of chapter 15 of title 31, United States Code shall apply to the lease transactions under this section, except that the limitation in section 1553(b)(2) shall not apply.
>
> (5) The Secretary shall lease aircraft under terms and conditions consistent with this section and consistent with the criteria for an operating lease as defined in OMB Circular A–11, as in effect at the time of the lease.
>
> (6) Lease arrangements authorized by this section may not commence until:
>
> (A) The Secretary submits a report to the congressional defense committees outlining the plans for implementing the Pilot Program. The report shall describe the terms and conditions of proposed contracts and describe the expected savings, if any, comparing total costs, including operation, support, acquisition, and financing, of the lease, including modification, with the outright purchase of the aircraft as modified.
>
> (B) A period of not less than 30 calendar days has elapsed after submitting the report.
>
> (7) Not later than 1 year after the date on which the first aircraft is delivered under this Pilot Program, and yearly thereafter on the anniversary of the first delivery, the Secretary shall submit a report to the congressional defense committees describing the status of the Pilot Program. The Report will be based on at least 6 months of experience in operating the Pilot Program.
>
> (8) The Air Force shall accept delivery of the aircraft in a general purpose configuration.
>
> (9) At the conclusion of the lease term, each aircraft obtained under that lease may be returned to the contractor in the same configuration in which the aircraft was delivered.

(10) The present value of the total payments over the duration of each lease entered into under this authority shall not exceed 90 percent of the fair market value of the aircraft obtained under that lease.

(d) No lease entered into under this authority shall provide for—

(1) the modification of the general purpose aircraft from the commercial configuration, unless and until separate authority for such conversion is enacted and only to the extent budget authority is provided in advance in appropriations Acts for that purpose; or

(2) the purchase of the aircraft by, or the transfer of ownership to, the Air Force.

(e) The authority granted to the Secretary of the Air Force by this section is separate from and in addition to, and shall not be construed to impair or otherwise affect, the authority of the Secretary to procure transportation or enter into leases under a provision of law other than this section.

(f) The authority provided under this section may be used to lease not more than a total of 100 Boeing 767 aircraft and 4 Boeing 737 aircraft for the purposes specified herein.

Sections 2401 and 2401a of title 10 of the U.S. Code, referred to in subsection (b) of the above provision, are laws that set forth the requirements and limitations that normally govern DoD leases of ships, aircraft, vehicles, and equipment.

Subchapter IV of chapter 15 of title 31, referred to in subsection (c)(4) of the above provision, sets forth laws on the budget process that govern the availability of appropriations for obligation and the closing of appropriation accounts at the end of the fiscal year, including the treatment of unobligated balances. Section 1553(b)(2) of title 31, which forms part of this subchapter, establishes a limit on authority provided in Section 1553(b)(1) under which, following the closure of an appropriation account, "obligations and adjustments to obligations that would have been properly chargeable to that account, both as to purpose and in amount, before closing and that are not otherwise chargeable to any current appropriation account of the agency may be charged to any current appropriation account of the agency available for the same purpose." Section (b)(2) limits the amount of appropriations that can be charged under this authority to no more than 1 percent of the total appropriations for the account.

The FY2000 defense appropriations act (P.L. 106-79 of October 25, 1999) contained a provision (Section 8133) somewhat similar to section 8159 above that permitted the Air Force to lease six aircraft "for operational support purposes, including transportation of the combatant Commanders in Chief," which are the U.S. military officers in charge of U.S. military forces operating in various regions of the world.

Appendix B. Net Present Value (NPV) Analysis[155]

Net present value (NPV) analysis is a method of calculating and comparing costs that takes into account the time value of money. The time value of money refers to the fact that a dollar available today (i.e., in the present) is worth more than a dollar available in the future, because inflation reduces the purchasing power of money over time, and because money available today can be invested to generate and return and grow over time. NPV analysis essentially adjusts the value of future sums of money to account for the investment value of money over time.

Both businesses and governments use NPV analysis. Governments can use NPV analysis for comparing spending options that involve making payments in differing years. The Office of Management and Budget (OMB) instructs executive branch agencies to use NPV analysis in comparing the costs of leasing and procurement options. This guidance is provided in OMB circular A-94, which sets forth guidelines for executive branch agencies to use in conducting benefit-cost analyses and evaluating federal programs.[156] Since procurement options usually involve making relatively large payments in the nearer term while leasing options usually involve making a series of smaller payments over a longer period of time, OMB officials and financial analysts elsewhere believe that NPV analysis, by accounting for the time value of money, provides for a methodologically more fair comparison.

Alternatives to NPV analysis include nominal (unadjusted) analysis and real (i.e., inflation-adjusted) analysis. Since procurement options usually involve making relatively large payments in the nearer term while leasing options usually involve making a series smaller payments over a longer period of time, nominal cost comparisons tend to be the least favorable to leasing options, real cost comparisons tend to be somewhat more favorable to leasing options, and NPV cost comparisons tend to be the most favorable to leasing options.

To illustrate the differences between nominal, real, and NPV cost comparisons, consider a simplified example involving hypothetical options for procuring or leasing four airplanes. For purposes of the example, assume that the four planes have a total of procurement cost of $500 (i.e., they cost an average $125 each to procure); that under the procurement option, the planes would be purchased using two annual payments of $250; and that under the leasing option, the planes would be leased for a period of 5 years, with annual lease payments of $108 per year. Assume also that the anticipated rate of inflation during this five-year period is 2% per year, and that the anticipated nominal rate of return on investments during this period is 5% per year (i.e., 3% per year more than the anticipated rate of inflation). What are the comparative costs of these two options?

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[155]This section prepared by Ronald O'Rourke, Specialist in National Defense, Foreign Affairs, Defense, and Trade Division.

[156]U.S. Office of Management and Budget. Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs. Washington, 2003. 22 p. This document is available on the Internet at [www.whitehouse.gov/omb/circulars/a094/a094.pdf] .

In a nominal (i.e., unadjusted) calculation, also called a then-year dollar calculation, neither the effect of inflation on eroding purchasing power nor the investment value of money over time is taken into account, and the cost comparison looks like this:

Option	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Procure	250	250				**500**
Lease	108	108	108	108	108	**540**

As can be seen in the table, when calculated this way, the lease option is $40 more expensive than the procurement option.

In a real calculation, which adjusts the values of sums of money in future years to account for how inflation (in this case, at 2% per year) erodes the purchasing power of those sums, the cost comparison looks like this:

Option	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Procure	250	245.00				**495.00**
Lease	108	105.84	103.72	101.65	99.62	**518.83**

As can be seen in the table, when anticipated inflation is taken into account, the difference in cost between the two options is reduced from the $40 shown in the nominal calculation to $23.83. The entries in this table can be used to answer questions such as: "What is the purchasing power, in today's prices, of $108 in Year 5?" The answer is that, assuming a 2% annual rate of inflation, $108 in Year 5 would purchase $99.62 worth of goods in today's prices.

In an NPV calculation, which adjusts the values of sums of money in future years to account for the investment value of money over time (in this case, a 5% annual return on investment), the cost comparison looks like this:

Option	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Procure	250	238.10				**488.10**
Lease	108	102.86	97.96	93.29	88.85	**490.96**

As can be seen in the table, when the investment value of money over time is taken into account, the difference in cost between the two options is reduced from the $40 shown in the nominal calculation to $2.86. The entries in the NPV table can be used to answer questions such as: "What sum of money, if invested today at a 5% annual rate of return, would grow to a nominal total of $108 in Year 5?" The answer is that $88.85, if invested today at a 5% rate of return, would grow to a nominal total of $108 dollars by Year 5.

As shown in the table above, the NPV of the procurement option is $488.10 while the NPV of the lease option is $490.96. What these NPVs mean is that spending $488.10 now (i.e., in the present) is the same, from a financial point of view, as spending $250 now and $250 next year, while spending $490.96 now is the same, from a financial point of view, as spending $108 per year for the next five years.

The annual rate of return on investment used in an NPV analysis is called the discount rate because this is the rate at which the value of future sums of money is adjusted downward (i.e., discounted). Discount rates can be expressed in nominal terms (so as to include the annual inflation rate) or in real terms (so as to show the rate of return above the anticipated inflation rate). The example discussed here used a nominal discount rate of 5%, which was equivalent to a real discount rate of 3% (i.e., 5% minus the anticipated inflation rate of 2%).

The higher the discount rate, the greater the reduction in value over time. Consequently, a key factor in NPV analysis is to choose the correct discount rate.[157]

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[157]For more on NPV analysis, see the following Internet sites:
- www.toolkit.cch.com/text/P06_6530.asp
- www.finaid.org/loans/npv.phtml
- www.computerworld.com/managementtopics/roi/story/0,10801,78530,00.html
- www.prenhall.com/divisions/bp/app/cfldemo/CB/NetPresentValue.html
- www.computerworld.com/news/1999/story/0,11280,36470,00.html

Appendix C. Multi-year Procurement (MYP)[158]

What Is MYP And How Does It Differ From Annual Contracting?

Three Key Differences. Multi-year procurement (MYP), also called multi-year contracting, is a special contracting authority that Congress approves for a few major DoD procurement programs. The statute covering multi-year contracting for acquisition of property is 10 U.S.C. 2306b.[159] Key differences between annual contracting, which most DoD procurement programs use, and MYP include the number of years of purchases covered, authority for Economic Order Quantity (EOQ) purchases, and termination liabilities.

Contracts Cover 2 to 5 Years of Planned Purchases. The principal difference between annual contracting and MYP concerns the number of years of purchases that can be covered by a single contract. Under annual contracting, DoD is permitted to sign a contract to purchase no more than a single year's purchase of a weapon or platform, and only after Congress has provided the necessary funding for that year's purchase. Under MYP, in contrast, DoD is permitted sign a contract covering two to five year's of planned purchases of that weapon or platform, including the initial year's purchase that Congress has already funded and one to four additional years worth of planned purchases that will not be funded until Congress passes the DoD budgets for each of those future fiscal years.

As an example, consider a case in which DoD plans to procure a total of 40 airplanes during the 5-year period FY2004-FY2008 in annual quantities of 4, 10, 10, 10, and 6. Under annual contracting, following enactment of an FY2004 DoD budget that funds the procurement of the first 4 planes, DoD could sign a contract to purchase those 4 planes. A year later, following enactment of an FY2005 budget that funds the procurement of the next 10 planes, DoD could sign a second contract to purchase those 10 planes. And so on.

Under MYP, in contrast, following enactment of the FY2004 budget that funds the procurement of the first 4 planes, DoD could sign a contract covering up to5 years of planned purchases (all 40 planes), even though Congress at this point has funded the procurement of only the first 4 planes.

Authority For Economic Order Quantity (EOQ) Purchases. A second difference between annual contracting and MYP is that programs approved for MYP have the authority to make use of Economic Order Quantity (EOQ) purchasing. EOQ authority, which is written into 10 USC 2306b, permits programs using MYP to make up-front batch purchases of certain components of all the weapons or platforms being procured under the MYP contract, so as to get better prices on those components from the subcontractors that provide them. Ordering components this

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[158]This section prepared by Ronald O'Rourke, Specialist in National Defense, Foreign Affairs, Defense, and Trade Division.

[159]Multi-year contracting for acquisition of services is covered in 10 USC 2306c.

way can be referred to as **o**rdering them in **e**conomic **q**uantities, which (after some reversing of word order) leads to the acronym EOQ. EOQ purchases are a principal means by which MYP contracting reduces costs compared to annual contracting, and programs approved for MYP are expected to take advantage of EOQ purchases so as to generate these savings.

As an illustration using the example from above, if DoD has been granted authority to sign a 5-year MYP covering the 40 planes planned for FY2004-FY2008, DoD might bundle together the 50 sets of landing gear intended for those planes and order them all together in FY2004, the initial year of the contract. The FY2004 budget for the program consequently would include funding sufficient to procure not only the first 4 planes, but 40 sets of landing gear as well. In a detailed presentation of the FY2004 budget request for the program, the funding for the 40 sets of landing gear would appear as advanced procurement (AP) funding in support of the MYP, sometimes abbreviated as AP (MYP).

Larger Termination Liability. A third way in which MYP differs from annual contracting is that MYP contracts can feature larger termination liabilities (i.e., cancellation penalties) than annual contracts. These larger termination liabilities protect contractors from the financial consequences of a decision by DoD to change its mind in the middle of a multi-year procurement and not procure the minimum number of units each year established in the MYP contract. Specifically, the larger termination liability is intended to ensure that a contractor is compensated for any investments in work force optimization and improved production equipment that the contractor has made as a consequence of the government's MYP commitment, but which the contractor will no longer be able to fully exploit due to DoD's change of mind. The larger termination liability deters DoD from changing its mind, giving the contractor confidence that DoD will fulfill its MYP commitment.

One Similarity: Full Funding Policy Still Applies. One way in which MYP does *not* differ from annual contracting is that MYP programs, like annually contracted programs, are subject to the full funding policy regarding defense procurement. Obtaining MYP authority for a program, in other words, does not exempt that program from the requirement to fully fund each year's worth of procurement. The up-front EOQ purchase in an MYP program must also be fully funded. Thus, in the example above, the FY2004 budget must fully fund the 4 planes being procured that year as well as the 40 sets of landing gear being purchased under EOQ authority. No portion of the procurement cost of the 4 planes or the 40 sets of landing gear may be funded in a fiscal year after FY2004. The FY2005 budget must fully fund the 10 planes to be procured in FY2005 (minus the cost of their landing gears, which were paid for in FY2004), and no portion of their procurement cost may be funded in a fiscal year after FY2005. And so on.[160]

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[160]For a general discussion of the full funding policy, see CRS Report RL31404, *Defense Procurement: Full Funding Policy – Background, Issues, and Options for Congress*, by Ronald O'Rourke and Stephen Daggett. Washington, 2002. (Updated November 21, 2002) 41 p.

How Does Use of MYP Reduce Cost?

Using MYP generally reduces the procurement cost of the items covered under the MYP contract in two ways. One way, discussed above, is by reducing the cost of components that are procured up-front in large batches through the use of the EOQ authority that comes with MYP.

The second way that using MYP generally reduces the procurement cost of the items covered under the MYP contract is by giving the prime contractor the confidence to make investments in work force optimization and improved production equipment that the contractor would not be able to justify making in a situation of annual contracting. Under annual contracting, the prime contractor faces some uncertainty about whether procurements planned for future years will actually happen. MYP reduces that certainty and thus makes it less risky for the contractor to make investments in work force optimization and improved production equipment that can reduce unit production costs but would make economic sense for the contractor (i.e., generate a sufficient return on investment for the contractor) only if the contractor produces a certain minimum number of units over a period of several years. Investments in work force optimization can involve providing extra training to workers to improve their productivity, or keeping on the payroll highly productive workers who might be laid off after completing their portion of the work involved in producing a single year's worth of production. Investments in improved production equipment can involve purchasing new machine tools that make components more quickly, more accurately, or with less waste.

How Much Does Use Of MYP Reduce Costs?

Savings from use of MYP vary from program to program, but typically, they can reduce the combined procurement cost of the items being procured under the MYP contract by 5% to 10%. A significant share of this savings is achieved by using the EOQ authority that comes with MYP. If an MYP program uses a delayed (and thus smaller) EOQ than would be typical for the program (a possibility discussed in the main body of this report), then the total savings in procurement costs achieved would likely be smaller than the typical 5% to 10%.

Why Not Use MYP For All DoD Procurement Programs?

If using MYP can reduce the cost of a DoD procurement program, why does Congress grant authority only sparingly, for a few DoD programs? One reason is that Congress as a general practice prefers to avoid taking actions that commit future Congresses to a particular course of action, which is sometimes called "tying the hands" of future Congresses. Permitting the use of MYP on a program effectively ties the hands of future Congresses with respect to that program by committing future Congresses to procuring a certain minimum number of units over a period of several years.

In addition to tying the hands of future Congresses, MYP, by effectively locking a program into place for several years, reduces the DoD's and Congress' options for making adjustments (particularly downward adjustments) to the DoD budget to

respond to changing military needs or budgetary circumstances. DoD and Congress usually cannot make substantial downward adjustments to MYP programs unless they are prepared to incur the sizeable termination liability costs that can be written into MYP contracts. As a result, any changes that DoD or Congress might need to make to the DoD budget to respond to changing circumstances will now fall more heavily on the non-MYP programs in the DoD budget. The larger the number of DoD programs that are approved for MYP, the more heavily the remaining non-MYP programs might have to bear the burden of any downward adjustment in the DoD budget. Shifting all DoD procurement programs, or many of them, to MYP would eliminate or significantly reduce DoD's and Congress' flexibility in adjusting the DoD budget in future years to respond to changing circumstances.

Thus, in considering a DoD request for MYP authority for a particular procurement program, Congress balances the potential savings that can be achieved by using MYP on the program against the effect that approving the use of MYP would have in tying the hands of future Congresses and reducing DoD's and Congress' flexibility in making adjustments to the DoD budget in the future to respond to changing circumstances. This weighing of potential advantages and disadvantages traditionally has resulted in a situation where only a few major DoD procurement programs at any one time are given MYP authority while most DoD procurement programs use annual contracting.

How Does Congress Approve MYP?

Defense Appropriation Act. Subsection (l)(3) of 10 USC 2306b states that "The head of an agency may not initiate a multi-year procurement contract for any system (or component thereof) if the value of the multi-year contract would exceed $500,000,000 unless authority for the contract is specifically provided in an appropriations Act." The appropriation act that usually provides MYP authority for DoD procurement programs is the annual defense appropriation act. The authority is usually granted through a provision in Title VIII of the act, which is the general provisions title. In recent years it has been Section 8008. In the FY2003 defense appropriations act, for example, Section 8008 provided MYP authority for the Air Force C-130 cargo plane program, the Army's Family of Medium Tactical Vehicles (FMTV) program, and the Navy's F/A-18E/F strike fighter aircraft program.

Defense Authorization Act. Subsection (i)(3) of 10 USC 2306b states that "In the case of the Department of Defense, a multi-year contract in an amount equal to or greater than $500,000,000 may not be entered into for any fiscal year under this section unless the contract is specifically authorized by law in an Act other than an appropriations Act." The "Act other than an appropriations Act" where DoD MYP contracts are authorized is usually the defense authorization act. In the defense authorization act, MYP is authority is usually granted on a program-by-program basis through separate sections in Title I of the act (the procurement title). In the FY2003 defense authorization act, for example, MYP authority was provided for the Air Force C-130 cargo plane program in Section 131, for the Army's FMTV program in Section 113, and for DoD procurement of certain chemicals relating to the U.S. space program in Section 826. In addition, Section 121 of the act extended the duration of a previously authorized MYP for the Navy's DDG-51 destroyer program.

Associated Committees. Given that MYP authority for a DoD procurement program is usually provided through provisions in both the defense appropriation and authorization bills, the granting of MYP authority for a DoD procurement program usually reflects a favorable recommendation on the issue by the committees with principal jurisdiction over these two bills – the House and Senate Appropriations committees and the House and Senate Armed Services committees, respectively.

What Criteria Do Programs Need To Meet To Qualify For MYP?

Subsection (a) of 10 USC 2306b sets forth 6 criteria that DoD procurement programs need to meet to qualify for MYP:

> To the extent that funds are otherwise available for obligation, the head of an agency may enter into multi-year contracts for the purchase of property whenever the head of that agency finds each of the following:
>
> (1) That the use of such a contract will result in substantial savings of the total anticipated costs of carrying out the program through annual contracts.
>
> (2) That the minimum need for the property to be purchased is expected to remain substantially unchanged during the contemplated contract period in terms of production rate, procurement rate, and total quantities.
>
> (3) That there is a reasonable expectation that throughout the contemplated contract period the head of the agency will request funding for the contract at the level required to avoid contract cancellation.
>
> (4) That there is a stable design for the property to be acquired and that the technical risks associated with such property are not excessive.
>
> (5) That the estimates of both the cost of the contract and the anticipated cost avoidance through the use of a multi-year contract are realistic.
>
> (6) In the case of a purchase by the Department of Defense, that the use of such a contract will promote the national security of the United States.

Criterion (1) is intended to disqualify programs where the anticipated savings from using MYP are relatively minor and thus not worth the consequences in terms of tying the hands of future Congresses and reducing DoD's and Congress's flexibility for making adjustments to future DoD budgets in response to changing circumstances. The clause previously required a minimum anticipated savings of 10%, but was changed in the early 1990s to a requirement for "substantial savings," which in practice might be understood to mean at least 5% or so, and preferably something closer to a minimum of10%.

Criterion (2) is intended to disqualify programs where there might be a significant risk of DoD changing its mind about the need for procuring the item in the annual and total quantities set forth in the MYP contract due to changing military requirements – a decision which could incur a sizeable termination liability. Criterion (3) is similarly intended to disqualify programs where there might be a significant risk of DoD changing its mind about the need for procuring the item in

the annual quantities set forth in the MYP contract due to a service's inability to fully fund the program. Criterion (4) is intended to disqualify programs where there might be a significant risk of incurring the potentially high costs associated with issuing change orders to alter the design of weapons and platforms that are under construction.