

# CRS Report for Congress

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## Air Force Aerial Refueling

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### Summary

Aerial refueling aircraft are key to air operations. The U.S. tanker fleet is large and effective, but old. Modernizing or replacing the current fleet of tankers presents the Department of Defense (DOD) with difficult choices in terms of desired capabilities, force structure, and budget. How this fleet will be maintained or replaced, and on what schedule, has proven controversial. This report will be updated as events warrant.

### Background

Modern military air operations require aerial refueling. Refueling aircraft, or tankers, extend the range of fighters, bombers, and other aircraft. Tankers increase the range and flexibility of projection forces. They increase the amount of time that combat and surveillance aircraft can stay “on-station,” and they boost combat aircraft lethality. According to senior Air Force officials, “Clearly the tanker fleet is really some of the very fiber that holds our Air Force’s unique global capabilities together. It is an essential enabler for getting to the fight and fighting the fight.”<sup>1</sup> Navy aircraft can be configured to refuel other Navy or Marine Corps aircraft, but the Navy prefers to use “big wing” Air Force tankers for long-range flight operations.<sup>2</sup>

Air Force and Department of Defense (DOD) leaders believe they need 550-650 KC-135-like aircraft.<sup>3</sup> Yet the need for aerial refueling could grow in the future. Over the past several years, the United States has reduced by two-thirds the number of forward bases

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<sup>1</sup> A. Butler, “Air Force Mulling Replacement for Aging, Maintenance-Needy KC-135,” *Inside the Air Force*, May 4, 2001.

<sup>2</sup> Department of the Navy (N78) provided to CRS by USN LLW via email Sept. 2, 2005.

<sup>3</sup> See, for example, *Tanker Requirements Study-05*. Department of the Air Force, Air Mobility Command. February 2001, and *Mobility Capabilities Study* (MCS). Office of the Secretary of Defense. December 2005.

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from which it can operate. Major overseas en route air bases have declined 69%.<sup>4</sup> Thus, to maintain the same level of engagement, U.S. forces must deploy more frequently and over greater distances.

**Air Force Capabilities.** The majority of the Air Force's tankers are Boeing **KC-135 Stratotankers**. The Air Force owns 531 Stratotankers: 114 "E" models, and 417 more capable "R" models. The average KC-135 is approximately 45 years old. The KC-135 can carry 200,000 lbs of fuel that it dispenses to USAF aircraft through a flying boom. A drogue can be attached to refuel Navy, Marine Corps, or allied-country aircraft. The Multi-Point Refueling System Program outfits 20 KC-135Rs with wingtip pods so the aircraft can simultaneously refuel two probe-equipped aircraft. The KC-135 can also carry 35,000 lbs of cargo in addition to its fuel payload. The Stratotanker is expected to fly until 2040.

The Air Force also owns 59 Boeing **KC-10A Extenders**. The KC-10 has an average fleet age of 21.5 years. The KC-10 is more flexible and more capable than the KC-135. It can carry twice as much fuel as the *Stratotanker*, (356,000 lbs) and can be refueled in the air to increase delivery range or on-station time. All KC-10s use the flying boom, and 20 can employ wing tip probe and drogue systems. The KC-10 can carry up to 75 troops and 170,000 lbs of cargo in addition to its fuel payload, representing approximately 12% of all of DOD's organic airlift capability. Current plans call for the KC-10 to remain in the active inventory through 2040.

A brief review of recent conflicts underscores the importance of tanker aircraft. In both Iraq and Afghanistan, U.S. military aircraft projected power over long distances and in theaters with less than desirable access to forward bases or neighboring airspace. Thus, combat and support aircraft had to fly great distances both to the theater and while in theater, increasing aerial refueling demands. A large proportion of the Air Force's aerial refueling fleet (149 KC-135s, and 33 KC-10s) participated in Operation Iraqi Freedom, flying over 6,000 sorties and offloading over 300 million pounds of fuel.

**Modernization Controversy.** Modernizing or replacing the Air Force tanker fleet has been a point of contention for 10 years. In 1996, the General Accounting Office (GAO) asserted that the long-term viability of the KC-135 fleet was questionable and advocated expeditiously studying replacement options. DOD countered that KC-135 airframe hours were low and that the fleet was sustainable for another 35 years.<sup>5</sup> In 2001, the Air Force reported 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."<sup>6</sup> At that time, the Air Force position on tanker modernization was to conduct an analysis of alternatives (AOA) to determine the optimal replacement option for KC-135s. Recapitalization would begin in the 2012 time frame to meet the KC-135 2040 retirement.

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<sup>4</sup> *Basic Air Force Structure and Expeditionary Aerospace Force (EAF) Operations*, Maj. Gen. H. Chandler, Presentation to U.S. Air Force Caucus, Bolling AFB, Mar. 23, 2001.

<sup>5</sup> GAO/NSIAD-96-160.

<sup>6</sup> "KC-135 Economic Service Life Study," Technical Report F34601-96-C-0111, Feb. 9, 2001.

Section 8159 of the FY2002 DOD Appropriations Act (P.L. 107-117) authorized the Air Force to lease 100 Boeing KC-767 aircraft to replace the oldest KC-135Es. This proposal proved controversial because section 8159 appeared to depart from traditional acquisition processes and to weaken congressional oversight. It was also established that a lease would cost more than procuring the aircraft, and many found Air Force arguments in favor of the lease to contradict its position of just a year prior. The proposed lease was debated in four congressional hearings, culminating with a pair of Senate hearings in September 2003.<sup>7</sup> Subsequently, alleged and admitted ethical violations by government and industry representatives involved in the lease proposal added to the controversy.

The FY2004 Defense Authorization Act (P.L. 108-136, Sec. 135) forged a compromise between opponents and proponents of the KC-767 by giving the Air Force permission to lease 20 tanker aircraft and purchase no more than 80 aircraft. Section 134 of this act prohibited the Air Force from retiring in FY2004 more than 12 KC-135Es. In September 2004, it was announced that the Air Force had grounded 29 KC-135Es due to safety concerns. Conferees also mandated that the Air Force conduct an aerial refueling AOA (Sec. 134) and that an independent assessment be conducted on the condition of the KC-135E fleet (Sec. 345).

On February 1, 2004, former Deputy Secretary of Defense Paul Wolfowitz requested that the Defense Science Board (DSB) conduct the independent analysis of the KC-135E fleet, and on February 24, 2004, former acting Undersecretary of Defense for Acquisition Michael Wynne directed the Air Force to conduct an aerial refueling AOA. Although it had the statutory authority to proceed, DOD did not request any funds for FY2005 to lease 20 aircraft or procure 80 aircraft. Defense Department leaders instead deferred executing either action until the completion of the DSB report, and an internal investigation by the DOD Inspector General (IG) on potential improprieties by Boeing Company executives and whether these activities negatively effected the Tanker lease program.

On April 20, 2004, Darleen A. Druyan, the former lead Air Force negotiator on the tanker lease program, pleaded guilty to one charge of criminal conspiracy. Ms. Druyan admitted to secretly negotiating an executive job with the Boeing company while still overseeing the \$23 billion deal between the Air Force and Boeing.<sup>8</sup> Lease supporters argued that Ms. Druyan was a single “bad apple” and that her actions did not negate the KC-767’s merits. In February 2005, however, it was reported that the DOD IG found that Air Force Secretary James Roche misused his office when he lobbied the Office of Management and Budget (OMB) to support the lease concept.<sup>9</sup> The IG’s final report found that four other senior DOD officials were guilty of evading OMB and DOD acquisition regulations that are designed to demonstrate best business practices and to provide accountability. The DOD IG found that senior DOD officials knowingly misrepresented the state of the KC-135 fleet and aerial refueling requirements.<sup>10</sup>

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<sup>7</sup> See CRS Report RL32056, *The Air Force KC-767 Tanker Lease Proposal*

<sup>8</sup> R. Merle, “Ex-Pentagon Official Admits Job Deal,” *Washington Post*, Apr. 21, 2004.

<sup>9</sup> R. Jeffrey Smith, “Roche Cited for 2 Ethics Violations,” *Washington Post*, Feb. 10, 2005.

<sup>10</sup> *Management Accountability Review of the Boeing KC-767A Tanker Program*, Office of the Inspector General of the Department of Defense, OIG-2004-171, May 13, 2005.

## FY07 Congressional Action

As part of its FY07 budget request, the Air Force requested \$240 million for KC-135 replacement and expressed its plan to retire 78 KC-135Es. Both House and Senate authorizers rejected the Air Force request for \$36.1 million in procurement funds. Senate authorizers cut \$199 million from the \$204 million requested in R&D funds, while the House cut \$51 million from this request. House and Senate authorizers, (Sec. 135, 109-452 and Sec. 143, 109-254 respectively), agreed to allow the Air Force to retire only the 29 KC-135Es grounded due to safety concerns.

## Issues for Congress

The FY2005 Defense Authorization Act (P.L. 108-375) contained a provision (Sec.133) that terminated the leasing authority granted by P.L. 108-136 (Sec. 135). Resurrecting the KC-767 lease, or initiating a similar lease, appears unlikely. As DOD considers new efforts to modernize or replace the Air Force aerial refueling fleet, several issues appear to compete for congressional attention.

**Potential Tanker Options.** There appear to be four general options for recapitalizing the aerial refueling capability of the KC-135E fleet: re-engine and modernize the current fleet, purchase one or more models of new commercial aircraft and convert them into a military tanker, purchase and convert used commercial aircraft into tankers, and lease aerial refueling services from the private sector. As part of its oversight function, Congress may wish to assess the strengths and weaknesses of each option and to assess whether implementing a single option or a mix of options is the most cost effective way to recapitalizing the aging KC-135 fleet.

In May 2004, the Defense Science Board (DSB) published its independent assessment of the condition of the aerial refueling fleet. In addition to rebutting Air Force claims that the KC-135 fleet urgently needed to be replaced, the DSB recommended that “serious consideration be given” to purchasing and converting used aircraft for aerial refueling (especially the DC-10), re-engining some KC-135s, and increasing the use of commercial aerial refueling services. While others have also suggested these options (See CRS Report RL32056), the DSB is DOD’s most respected group of scientific and technical advisors, and its recommendations tend to be influential.

The DSB also noted that a tanker fleet consisting of two different types of aircraft — large, long-range tankers and smaller, “tactical tankers” — is likely most prudent and effective. This recommendation may be gaining some traction within the Air Force. In August 2005, two important Air Force leaders (now both retired), Chief of Staff Gen. John Jumper and Air Mobility Command’s Chief Gen. John Handy, recommended acquiring more large tankers, like the KC-10.<sup>11</sup> Larger tankers could potentially be based on aircraft such as the Boeing 777, the Airbus A330, or the C-17 airlifter. In the past, the Air Force has resisted suggestions to equally combine the airlift and refueling missions

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<sup>11</sup> M. Selinger, “U.S. Air Force Needs More ‘KC-10-Like’ Tankers, General Says,” *Aerospace Daily*, Aug. 3, 2005. J. Bennett, “Jumper Forecasts Changes for USAF Aerial Refueling Tanker Fleet,” *Inside the Air Force*, Sept. 2, 2005.

on a single large aircraft, but new budgetary constraints and the potential closing of the C-17 production line in January 2007 may increase the appeal of this concept.

The congressionally-mandated analysis of alternatives (AoA) was completed in December 2005 and released to Congress in early 2006. This study found that purchasing new medium-to-large commercial aircraft and converting them into tankers was the most cost effective approach. Commercial aircraft in medium-to-large class include the Airbus 330 and 340, and the Boeing 767, 787, 777 and 747. The AoA's estimates of the cost-effectiveness of these aircraft are close enough that all can be considered as candidates, as could a mix of these aircraft. The AoA did not find cost-effective, the options recommended by the DSB: re-engining KC-135Es, converting used aircraft into tankers, and leasing commercial aerial refueling services.

The AoA may be correct that purchasing approximately 500 new aircraft over the coming decades may be the most cost effective way to re-capitalize the KC-135 fleet. Purchasing 500 new aircraft also appears to be the most capital intensive option. To realize the maximum economic benefit, the Air Force will need, for many years, to invest a relatively large portion of its annual budget to purchasing tankers. The AoA notes that cost effectiveness estimates are *highly sensitive* to cost of the basic commercial aircraft prior to any military modification – also known as the “green aircraft.” Thus, other recapitalization options may be relatively more cost effective if green aircraft can't be purchased for the desired price. Considering current emerging budget pressures, it may be useful to not prematurely decide against pursuing less capital intensive options such as re-engining some number of KC-135Es, purchasing used aircraft, and in some cases, leasing aerial refueling services.

**Mobility Capabilities Study.** The AoA for KC-135 Recapitalization was informed by, and produced in parallel with DoD's Mobility Capabilities Study (MCS). The MCS is DoD's first comprehensive mobility study since before the September 11<sup>th</sup> terrorist attacks. The MCS has been criticized on a number of grounds. Unlike past studies, the MCS did not provide a quantitative airlift requirement expressed in millions of ton-miles per day. Also, the MCS did not, according to some observers, adequately assess intra-theater airlift needs. The close linkage between the MCS and the AoA suggests that perceived shortcomings in one study apply to the other study.

**Industrial Base Concerns.** Since 2001, discussions about replacing the KC-135 fleet have featured debates over potential consequences for the U.S. aviation industrial base generally and the Boeing Co. specifically. Some claimed that the KC-767 lease was a financial “bailout” for Boeing, while others noted that U.S. aircraft manufacturers had suffered from reduced business after the September 11, 2001 terrorist attacks. Replacing KC-135s with American aircraft would have a dual benefit, they argued. The industrial base debate appears to have taken on increased focus beginning in the Spring of 2005. The European Aeronautic Defense & Space Co. (EADS) announced that it would build the Airbus A330 aircraft in a new factory in Mobile, AL rather than in Europe. Northrop Grumman Corp. announced that it would team with EADS to compete for future aerial refueling aircraft contracts. The KC-30, as the refueling aircraft would be named, would,

according to Northrop officials, create 1,000 new American jobs and would be composed predominantly of American parts.<sup>12</sup>

Boeing supporters have complained that EADS receive direct government subsidies, making them unfairly competitive. In May 2005, the House Armed Services Committee published its version of the FY2006 Defense Authorization Act (H.R. 1815, H.Rept. 109-89), which some argue “levels the playing field” for the U.S. aircraft industry. Section 817 would prohibit DOD from entering into a contract with any foreign company (including a joint venture) that received subsidies from a government in the World Trade Organization. This would appear to bar EADS from future tanker competition.

Supporters of limiting competition for future Air Force tanker contracts to U.S. companies argue that such action is warranted and vital to the health of the industrial base. Airbus, they note, was created in the early 1970s for the express purpose of maintaining and fostering the European commercial jet aircraft industry. Airbus’ growing international success, it is argued, is due to heavy and unfair subsidies from European governments, some of which violated the General Agreement on Tariffs and Trade (GATT).<sup>13</sup> European defense firms are increasingly successful in winning U.S. defense contracts, such as the VXX Presidential Helicopter, and the Army’s Light Utility Helicopter (LUH). These successes come at the expense of U.S. companies, and U.S. jobs, and make the United States dangerously dependent on foreign defense companies, it is argued. Further, the consolidation of the U.S. defense industrial base could reduce both domestic competition and innovation, ultimately resulting in less competitive and effective future products.

Opponents of limiting competition for future Air Force tanker contracts to U.S. companies argue that such protection is unnecessary and potentially counterproductive. Such protections are unnecessary, it is argued, because DOD’s 2005 *Annual Industrial Capabilities Report to Congress* states that the U.S. defense industrial base is healthy and a world leader in 236 of 255 critical defense technologies.<sup>14</sup> Further, the United States enjoys a foreign trade surplus in aerospace products, which is growing in 2005.<sup>15</sup> European companies have argued for years that U.S. companies like Boeing also receive indirect government subsidies, and this perspective was implicitly recognized by a 1992 agreement on aircraft trade between the United States and the European Community.<sup>16</sup> Finally, some argue that increased European success in the U.S. defense market proves that this increases competition, which ultimately benefits U.S. civilian and military end-users, and more such “globalization” is to be promoted.<sup>17</sup>

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<sup>12</sup> J. Karp, “Northrop, EADS Join on Air Force Proposal,” *Wall Street Journal*, Sept. 8, 2005.

<sup>13</sup> For more information, see CRS Report RS21002, *Boeing/Airbus: Size, Speed, and Subsidies*.

<sup>14</sup> Sharon Weinberger, “Annual Report Paints Rosy Picture of Defense Industrial Base,” *Defense Daily*, Mar. 28, 2005.

<sup>15</sup> “Aerospace Foreign Trade Surplus Growing,” *Defense Daily*, Sept. 6, 2005.

<sup>16</sup> RS21002 *Opcit.*

<sup>17</sup> Dave Ahearn, “Heritage Foundation Urges Further Defense Industry Globalization,” *Defense Today*, July 29, 2005.