



Air Force KC-X Tanker Aircraft Program: Background and Issues for Congress

Ronald O'Rourke
Specialist in Naval Affairs

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Summary

The Administration's proposed FY2010 defense budget requests \$439.6 million in Air Force research and development funding to begin a new program for acquiring new 179 KC-X aerial refueling tankers. The 179 KC-Xs, which could be procured at an annual rate of 12 to 18 aircraft and cost roughly \$200 million each, would replace roughly one-third of the Air Force's aging fleet of KC-135 aerial refueling tankers. The Air Force and the U.S. Transportation Command state that replacing the KC-135s is their highest recapitalization priority.

The two expected competitors for the KC-X program are Boeing, which is expected to offer a KC-X based on the Boeing 767 or Boeing 777 commercial airliner, and an industry team consisting of Northrop Grumman and the European Aeronautic Defense and Space Company (EADS—the parent company of Airbus), which is expected to offer a KC-X based on the Airbus A330 commercial airliner. A Boeing KC-X would be assembled in Seattle, while a Northrop/EADS KC-X would be assembled in Mobile, AL.

The administration's proposed new KC-X program follows previous unsuccessful attempts by the Department of Defense (DOD) to implement a KC-X acquisition program for replacing the KC-135s. The history of those earlier attempts forms an important part of the context for the Administration's proposed new KC-X program, particularly in terms of defining the capabilities that are needed in the KC-X and designing and conducting a fair competition between aircraft offered by Boeing and Northrop/EADS.

The issue for Congress in FY2010 is whether to approve, reject, or modify the Administration's request for FY2010 research and development funding for the new KC-X program, and whether to take any action to define the acquisition strategy for the new KC-X program. Key acquisition-strategy issues include whether to procure one KC-X design or two, and (if only one design is to be procured, as the Administration prefers), how to structure and conduct the competition for determining the winning design.

The House and Senate Armed Services Committees, in their markups of the FY2009 defense authorization bill (H.R. 2647/S. 1390), both recommend approving the Administration's request for \$439.6 million in research and development funding for the KC-X program.

Section 1044 of H.R. 2647 would repeal Section 1081 of the FY2008 defense authorization act (H.R. 4986/P.L. 110-181 of January 28, 2008), which directed the Secretary of the Air Force to conduct a pilot program of at least five years' duration to assess the feasibility and advisability of utilizing commercial fee-for-service air refueling tanker aircraft for Air Force operations.

Section 1058 of S. 1390 would amend Section 1081 of the FY2008 defense authorization act (H.R. 4986/P.L. 110-181 of January 28, 2008), to make changes intended to facilitate the implementation of a fee-for-service air refueling support pilot program.

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Introduction

The Administration's proposed FY2010 defense budget requests \$439.6 million in Air Force research and development funding to begin a new program for acquiring new 179 KC-X aerial refueling tankers.¹ The 179 KC-Xs, which could be procured at an annual rate of 12 to 18 aircraft and cost roughly \$200 million each, would replace roughly one-third of the Air Force's aging fleet of KC-135 aerial refueling tankers. The Air Force and the U.S. Transportation Command state that replacing the KC-135s is their highest recapitalization priority.

The two expected competitors for the KC-X program are Boeing, which is expected to offer a KC-X based on the Boeing 767 or Boeing 777 commercial airliner, and an industry team consisting of Northrop Grumman and the European Aeronautic Defense and Space Company (EADS—the parent company of Airbus), which is expected to offer a KC-X based on the Airbus A330 commercial airliner. A Boeing KC-X would be assembled in Seattle, while a Northrop/EADS KC-X would be assembled in Mobile, AL.

The administration's proposed new KC-X program follows previous unsuccessful attempts by the Department of Defense (DOD) to implement a KC-X acquisition program for replacing the KC-135s. The history of those earlier attempts forms an important part of the context for the Administration's proposed new KC-X program, particularly in terms of defining the capabilities that are needed in the KC-X and designing and conducting a fair competition between aircraft offered by Boeing and Northrop/EADS.

The issue for Congress in FY2010 is whether to approve, reject, or modify the Administration's request for FY2010 research and development funding for the new KC-X program, and whether to take any action to define the acquisition strategy for the new KC-X program. Key acquisition-strategy issues include whether to procure one KC-X design or two, and (if only one design is to be procured, as the Administration prefers), how to structure and conduct the competition for determining the winning design. Congress' decision on this issue could affect DOD capabilities and funding requirements, and the aircraft manufacturing industrial base.

Background

Roles and Missions of Aerial Refueling Aircraft

Aerial refueling aircraft—commonly called tankers—provide in-flight refueling services to bombers, fighters, strike fighters, airlift aircraft, surveillance aircraft, and other types of aircraft flown by the Air Force, Navy, and Marine Corps. Tankers enable other aircraft to deploy quickly to distant theaters of operation, and to remain in the air longer while operating in those theaters. Aerial refueling capability is a critical component of the U.S. military's ability to project power overseas and to operate military aircraft in theater with maximum effectiveness.

¹ In the designation KC-X, C means a cargo-type aircraft, K means that the aircraft is specifically an aerial refueling tanker, and X means the design of the aircraft has not been determined.

Current Fleet of Large Aerial Refueling Aircraft

KC-135 Stratotanker

The Air Force's current fleet of large tankers consists mostly of KC-135 Stratotankers. The Air Force states that, as of September 2008, a total of 453 KC-135s were in the inventory of the Air Force (182 aircraft), the Air National Guard (206 aircraft), and the Air Force Reserve (65 aircraft).² Somewhat confusingly, the Air Force also states that the service's Air Mobility Command (AMC) as of September 2008 managed an inventory of more than 481 Stratotankers, including 294 flown by the Air National Guard and Air Force Reserve in support of AMC missions.³ The commander of the U.S. Transportation Command, in February 2009 testimony to Congress, mentioned a figure of 415 KC-135s.⁴ The Air Force states that:

The KC-135 Stratotanker provides the core aerial refueling capability for the United States Air Force and has excelled in this role for more than 50 years. This unique asset enhances the Air Force's capability to accomplish its primary missions of Global Reach and Global Power. It also provides aerial refueling support to Air Force, Navy and Marine Corps and allied nation aircraft. The KC-135 is also capable of transporting litter and ambulatory patients using patient support pallets during aeromedical evacuations.⁵

The KC-135s are among the oldest of the Air Force's aircraft. The first production KC-135 was delivered to the Air Force in 1957, and the final one was delivered in 1965.⁶ DOD and Air Force documents for FY2010 state variously that average age of the KC-135 fleet in 2009 is more than 45 years,⁷ 47 years,⁸ 48 years,⁹ or more than 48 years.¹⁰ The aircraft have received various

² Air Force Fact sheet on the KC-135, available online at <http://www.af.mil/information/factsheets/factsheet.asp?fsID=110>. The fact sheet was accessed by CRS on July 29, 2009, at which time it carried a date of September 2008.

³ Air Force Fact sheet on the KC-135, available online at <http://www.af.mil/information/factsheets/factsheet.asp?fsID=110>. The fact sheet was accessed by CRS on July 29, 2009, at which time it carried a date of September 2008.

⁴ Statement of General Duncan J. McNabb, USAF Commander, United States Transportation Command, Before the House Armed Services Air & Land Forces and Seapower & Expeditionary Forces Subcommittees [Hearing] On the State of the Command, February 25, 2009, p. 6.

⁵ Air Force Fact sheet on the KC-135, available online at <http://www.af.mil/information/factsheets/factsheet.asp?fsID=110>. The fact sheet was accessed by CRS on July 29, 2009, at which time it carried a date of September 2008.

⁶ A total of 732 KC-135s were delivered to the Air Force.

⁷ See, for example, Department of Defense, *Fiscal Year 2010 Budget Request, Summary Justification*, May 2009, p. 1-50, or United States Air Force, *FY 2010 Budget Overview*, SAF/FMB, May 2009, p. 48.

⁸ See, for example, Department of Defense, *Fiscal Year 2010 Budget Request, Summary Justification*, May 2009, p. 1-16.

⁹ See, for example, Department of the Air Force, *Fiscal Year (FY) 2010 Budget Estimates, Research, Development, Test and Evaluation (RDY&E) Descriptive Summaries, Volume II, Budget Activities 4 – 6*, May 2009, Exhibit R-2, RDT&E Budget Item Justification, [PE]0605221F, KC-X, Next Generation Aerial Refueling Aircraft, page 1 of 8 (page 559 of the overall document).

¹⁰ See, for example, Department of the Air Force, Presentation to the House Armed Services Committee Subcommittee on Air and Land Forces, United States House of Representatives, Combined Statement of: Lieutenant General Daniel J. Darnell, Air Force Deputy Chief Of Staff For Air, Space and Information Operations, Plans And Requirements (AF/A3/5) Lieutenant General Mark D. Shackelford, Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ) Lieutenant General Raymond E. Johns, Jr., Air Force Deputy Chief of Staff for Strategic Plans And Programs (AF/A8), May 20, 2009, p. 17.

upgrades and modifications over the years, including new engines.¹¹ For a discussion of the potential longevity of the KC-135 fleet, see **Appendix E**.

KC-10 Extender

The Air Force as of September 2008 also operated 59 KC-10 Extender aerial refueling aircraft. The KC-10s are much younger than the KC-135s—the first KC-10 entered service in 1981.¹²

Earlier Attempts at a KC-X Program to Replace the KC-135s

The advanced age of the KC-135 fleet, and what to do about it, has been a matter of concern for policymakers since at least 1996.¹³ The Obama Administration's proposed new KC-X program follows previous unsuccessful attempts by DOD to implement a KC-X acquisition program for replacing the KC-135s. The history of those earlier attempts, summarized below, forms an important part of the context for the Administration's proposed new KC-X program, particularly

¹¹ Air Force Fact sheet on the KC-135, available online at <http://www.af.mil/information/factsheets/factsheet.asp?fsID=110>. The fact sheet was accessed by CRS on July 29, 2009, at which time it carried a date of September 2008. The fact sheet states that:

Of the original KC-135A's, more than 415 have been modified with new CFM-56 engines produced by CFM-International. The re-engined tanker, designated either the KC-135R or KC-135T, can offload 50 percent more fuel, is 25 percent more fuel efficient, costs 25 percent less to operate and is 96 percent quieter than the KC-135A.

Under another modification program, 157 Air Force Reserve and Air National Guard tankers were re-engined with the TF-33-PW-102 engines. The re-engined tanker, designated the KC-135E, is 14 percent more fuel efficient than the KC-135A and can offload 20 percent more fuel.

Through the years, the KC-135 has been altered to do other jobs ranging from flying command post missions to reconnaissance. KC-135s are used for special reconnaissance and Air Force Materiel Command's NKC-135A's are flown in test programs. Air Combat Command operates the OC-135 as an observation platform in compliance with the Open Skies Treaty.

The KC-135R/T model aircraft continue to undergo life-cycle upgrades to expand its capabilities and improve its reliability. Among these are improved communications, navigation, auto-pilot and surveillance equipment to meet future civil air traffic control needs.

¹² Air Force fact sheet on the KC-135, available online at <http://www.af.mil/information/factsheets/factsheet.asp?id=109>. J. The fact sheet was accessed by CRS on July 29, 2009, at which time it carried a date of September 2008. The fact sheet states that:

The KC-10 Extender is an Air Mobility Command advanced tanker and cargo aircraft designed to provide increased global mobility for U.S. armed forces. Although the KC-10's primary mission is aerial refueling, it can combine the tasks of a tanker and cargo aircraft by refueling fighters and simultaneously carry the fighter support personnel and equipment on overseas deployments. The KC-10 is also capable of transporting litter and ambulatory patients using patient support pallets during aeromedical evacuations.

The KC-10 can transport up to 75 people and nearly 170,000 pounds (76,560 kilograms) of cargo a distance of about 4,400 miles (7,040 kilometers) unrefueled.

In addition to KC-135s and KC-10s, the Air Force, Marine Corps, and Navy operate additional smaller refueling aircraft. The Air Force uses modified C-130s to refuel Air Force special operations and combat search and rescue helicopters. The Marine Corps uses modified C-130s to refuel Marine helicopters and fighters. Some Navy aircraft have been configured to give them a secondary capability to refuel other Navy or Marine Corps aircraft in flight.

¹³ In 1996, the General Accounting Office (now the Government Accountability Office) asserted that the long-term viability of the KC-135 fleet was questionable and advocated expeditiously studying replacement options. (General Accounting Office, *U.S. Combat Airpower: Aging Refueling Aircraft Are Costly to Maintain and Operate*, GAO/NSIAD-06-160, August 1996.) DOD countered at the time that KC-135 airframe hours were low and that the Air Force could sustain the fleet for another 35 years.

in terms of defining the capabilities that are needed in the KC-X and designing and conducting a fair competition between aircraft offered by Boeing and Northrop/EADS.

Leasing Authority of 2002

In response to concerns about the aging KC-135 fleet, Section 8159 of the FY2002 defense appropriations act (H.R. 3338/P.L. 107-117 of January 10, 2002) authorized the Air Force to lease up to 100 Boeing 767s (and also up to four Boeing 737s) for not more than 10 years. The leased 767s were to be modified into aerial refueling tankers and used as replacements for KC-135Es—the oldest and least capable KC-135s. For the text of Section 8159, see **Appendix A**.

The leasing arrangement authorized by Section 8159 became a matter of debate, in part because it appeared to depart from traditional acquisition processes and, some observers argued, had the potential for weakening congressional oversight of tanker acquisition. The General Accounting Office (now the Government Accountability Office) concluded that a lease would cost more than procuring the aircraft.¹⁴ Other observers argued that Air Force arguments in favor of the lease contradicted the service's position of just a year prior regarding the urgency for replacing the KC-135s.¹⁵ Congress examined the leasing arrangement in four hearings, culminating with two Senate committee hearings in September 2003.¹⁶

Leasing and Purchasing Authority of 2003

Section 135 of the FY2004 defense authorization act (H.R. 1588/P.L. 108-136 of November 24, 2003) legislated a compromise between leasing proponents and opponents by authorizing the Secretary of the Air Force to lease up to 20 tankers, and to use a multiyear procurement (MYP) arrangement beginning as early as FY2004 to procure up to 80 tankers using incremental funding. Section 135 also required the Secretary of Defense to conduct a study to identify alternative means for maintaining and providing training for leased or purchased tankers. For the text of Section 135, see **Appendix B**. Another provision of the act—Section 134—prohibited the Air Force from retiring more than 12 KC-135Es in FY2004.

Developments in 2004 and 2005

On February 1, 2004, Deputy Secretary of Defense Paul Wolfowitz requested that the Defense Science Board (DSB) conduct an independent analysis of the KC-135E fleet. On February 24, 2004, acting Undersecretary of Defense for Acquisition Michael Wynne directed the Air Force to

¹⁴ General Accounting Office, Military Aircraft[:]: Observations on the Air Force's Plan to Lease Aerial Refueling Aircraft, Statement of Neal P. Curtin, Director, Defense Capabilities and Management, Testimony before the Committee on Commerce, Science, and Transportation, United States Senate, GAO-031143T, September 3, 2003, 22 pp.

¹⁵ In 2001, the Air Force reported that the KC-135 fleet would incur "significant cost increases" between 2001 and 2040, but that "no economic crisis is on the horizon ... there appears to be no run-away cost-growth," and that "the fleet is structurally viable to 2040." (*KC-135 Economic Service Life Study*, Technical Report F34601-96-C-0111, February 9, 2001.) 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. The service would begin recapitalization in the 2012 time frame to meet KC-135 retirement by 2040, when the Air Force expected the KC-135 to reach the end of its service life.

¹⁶ For a discussion, see CRS Report RL32056, *The Air Force KC-767 Tanker Lease Proposal: Key Issues For Congress*, by Christopher Bolkom.

conduct an aerial refueling AOA. DOD deferred using the authority granted in Section 135 until the completion of both the DSB report and an internal investigation by the DOD Inspector General (IG) on potential improprieties by Boeing Company executives.¹⁷

RAND Study of 2006

In 2006, RAND Corporation concluded an Analysis of Alternatives (AOA) for recapitalizing the Air Force's KC-135 fleet. The AOA concluded that purchasing new commercially-derived tankers was the most cost-effective means of initially recapitalizing the fleet.¹⁸

KC-X Competition of 2007-2008

Consistent with the findings of the 2006 RAND report, the Air Force in early 2007 released a formal request for proposals (RFP) for the procurement of 179 new KC-X tankers.¹⁹ Boeing responded to the RFP with the KC-767—a tanker variant of the Boeing 767-200 commercial airliner. A team consisting of Northrop Grumman and EADS responded to the RFP with the KC-30 (later called the KC-45)—a tanker version of the Airbus 330-200 commercial airliner. A March 2009 GAO report summarizes subsequent events:

On February 29, 2008, the Air Force selected a consortium consisting of Northrop Grumman and the European Aeronautic Defense and Space Company (EADS)—the parent company of Airbus—over Boeing to build the KC-X tankers. In March 2008, Boeing filed a bid protest with GAO. On June 18, 2008, GAO sustained Boeing's protest and, consistent with that decision, recommended that the Air Force reopen discussions with the offerors, obtain revised proposals, re-evaluate the revised proposals, and make a new source selection decision. In July 2008, the Secretary of Defense stated that there would be a new solicitation requesting revised proposals from industry, and the Undersecretary of Defense for Acquisition, Technology and Logistics would replace the Air Force as the source selection authority. DOD expected to award the new contract by December 31, 2008. However, on September 10, 2008, the Secretary announced his decision to terminate the second competition noting there was not enough time for DOD to complete a competition that would be viewed as fair and competitive in such a highly-charged environment by January 2009, when the next administration would take office. He stated that rather than handing the next administration an incomplete and possibly contested process, the next team should review the military requirements objectively and craft a new acquisition strategy. Further, he added

¹⁷ On April 20, 2004, Darleen A. Druyan, the former lead Air Force negotiator on the tanker lease proposal, 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 leasing arrangement between the Air Force and Boeing. (R. Merle, "Ex-Pentagon Official Admits Job Deal," *Washington Post*, April 21, 2004.) Lease supporters argued that Ms. Druyan was a single "bad apple" and that her actions did not negate the merits of leasing Boeing 767s for use as tankers. In February 2005, however, the DOD IG reportedly concluded that Air Force Secretary James Roche misused his office when he lobbied the Office of Management and Budget (OMB) to support the lease concept. (R. Jeffrey Smith, "Roche Cited for 2 Ethics Violations," *Washington Post*, February 10, 2005.) The IG's final report concluded that four other senior DOD officials were guilty of evading Office of Management and Budget (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 air refueling requirements. (Department of Defense, Office of the Inspector General, *Management Accountability Review of the Boeing KC-767A Tanker Program*, OIG-2004-171, May 13, 2005.)

¹⁸ KC-135 Recapitalization Analysis of Alternatives. Briefing to Congress, January 26-27, 2006.

¹⁹ "Air Force Posts KC-X Request for Proposals," *Air Force Print News Today*, January 31, 2007, online at <http://www.af.mil/news/story.asp?id=123039360>.

that DOD plans to continue funding the program in the fiscal year 2010 through 2015 budget. The Chief of Staff of the Air Force stated that a new KC-X competition could take the new administration between 8 months and 4 years to complete.²⁰

For additional discussion of the RFP, Boeing's protest, and GAO's ruling on Boeing's protest, see **Appendix C**.

Administration's Proposed New KC-X Acquisition Program

FY2010 Funding Request

The Administration's proposed FY2010 defense budget requests \$439.6 million in Air Force research and development funding to begin a new program for acquiring new 179 KC-X aerial refueling tankers.²¹

Number of Aircraft Contemplated

The proposed new KC-X program envisages replacing the KC-135 fleet in three stages, of which the 179 new KC-Xs would represent the first stage, replacing roughly one-third of the KC-135 fleet. The replacement tankers to be procured in second and third stages of the effort would be designated KC-Ys and KC-Zs.

Potential Cost of Program

A March 2009 GAO report states that the procurement cost of 179 KC-Xs could be about \$35 billion,²² or an average of about \$195 million per aircraft. The Air Force testified in May 2009 that it has budgeted about \$3.5 billion per year for a projected procurement rate of 12 to 18 aircraft per year,²³ which would equate to an average cost of about \$195 million to \$290 million per aircraft. GAO states that, when the projected KC-Ys and KC-Zs are added in, the KC-135 replacement effort "is expected to involve the procurement of about 600 aircraft over 40 years at a cost that could exceed \$100 billion,"²⁴ or an average cost of roughly \$170 million per aircraft.

²⁰ Government Accountability Office, *Defense Acquisitions[:] Assessments of Selected Weapon Programs*, GAO-09-326SP, March 2009, p. 156.

²¹ The requested funding is found in the Air Force's research development, test and evaluation (RDT&E) account in PE (i.e., program element, meaning line item) 0605221F, KC-X, Next Generation Aerial Refueling Aircraft.

²² Government Accountability Office, *Defense Acquisitions[:] Assessments of Selected Weapon Programs*, GAO-09-326SP, March 2009, p. 156.

²³ Department of the Air Force, Presentation to the House Armed Services Committee Subcommittee on Air and Land Forces, United States House of Representatives, Combined Statement of: Lieutenant General Daniel J. Darnell, Air Force Deputy Chief Of Staff For Air, Space and Information Operations, Plans And Requirements (AF/A3/5) Lieutenant General Mark D. Shackelford, Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ) Lieutenant General Raymond E. Johns, Jr., Air Force Deputy Chief of Staff for Strategic Plans And Programs (AF/A8), May 20, 2009, p. 17

²⁴ Government Accountability Office, *Defense Acquisitions[:] Assessments of Selected Weapon Programs*, GAO-09-326SP, March 2009, p. 156.

Administration Plan: Competition for a Single Design

The Administration wants to build a single KC-X design, and wants to conduct a competition to select that design. The Air Force testified in May 2009 that:

The Air Force and the Department of Defense have been considering options for conducting a new source selection since the previous competition was terminated by the Secretary of Defense in September 2008. It is the Air Force's desire to begin the competition in Summer 2009 and award a contract in early 2010.²⁵

On July 27, 2009, it was reported that:

The Pentagon has notified prospective bidders that the long-awaited draft request for proposals for the U.S. Air Force's KC-135 replacement competition is now planned for release in mid-September—with a formal draft likely to follow in October. If this schedule holds, selection of the winning replacement refueling tanker design could be in mid-2010. That is roughly a six-month slip from earlier plans for the program.²⁶

Expected Competitors

Boeing is expected to offer a KC-X based on either the Boeing 767 or Boeing 777, while the Northrop/EADS team is expected to offer a KC-X based on the Airbus A330.

DOD Statements on KC-X as a High Priority

DOD states that “with the average age of the [KC-135] inventory over 45 years old, a new Tanker has become an operational necessity as well as a financially prudent decision to meet refueling requirements.”²⁷ The U.S. Transportation Command testified in February 2009 that:

My number one recapitalization priority is replacing the fleet of 415 Eisenhower-era KC-135s with a new platform to preserve a unique asymmetric advantage for our nation. The KC-X with multipoint refueling allowing same sortie service to Air Force, Navy, Marine and coalition aircraft will address the significant risk we are currently carrying in air capacity and address further capability risks associated with an airframe that is almost 50 years old - and will be over 80 years old by the time we recapitalize all of them. The ability to carry cargo and operate forward with defensive systems will be a game changer when the aircraft is not needed as a tanker. Further delays in replacing this aircraft will add significant risk to our ability to rapidly project combat power to support the nation and our allies. It is imperative to expedite a smart, steady reinvestment program.²⁸

²⁵ Department of the Air Force, Presentation to the House Armed Services Committee Subcommittee on Air and Land Forces, United States House of Representatives, Combined Statement of: Lieutenant General Daniel J. Darnell, Air Force Deputy Chief Of Staff For Air, Space and Information Operations, Plans And Requirements (AF/A3/5) Lieutenant General Mark D. Shackelford, Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ) Lieutenant General Raymond E. Johns, Jr., Air Force Deputy Chief of Staff for Strategic Plans And Programs (AF/A8), May 20, 2009, p. 17.

²⁶ “Tanker RFP,” *Aerospace Daily & Defense Report*, July 27, 2009: 1. See also Amy Butler, “Draft Tanker RFP Slips Into Fall,” *Aerospace Daily & Defense Report*, July 16, 2009: 1-2; and David Morgan, “Pentagon Eyes September For Next Step In Aerial Tanker,” *Reuters.com*, July 15, 2009.

²⁷ Department of Defense, *Fiscal Year 2010 Budget Request, Summary Justification*, May 2009, p. 1-50.

²⁸ Statement of General Duncan J. McNabb, USAF, Commander, United States Transportation Command, Before the (continued...)

The Air Force testified in May 2009 that:

The KC-X remains the Air Force's highest procurement and recapitalization priority. Air refueling is critical to the entire Joint and Coalition team's ability to project combat power around the world. The current fleet of Eisenhower-era KC-135s averages over 48 years old.

KC-X tankers will provide increased aircraft availability, more adaptable technology, more flexible employment options, and greater overall capability than the current fleet of KC-135R/T tankers. The KC-X will be able to refuel receptacle and probe-equipped aircraft on every mission and to receive fuel in-flight plus carry cargo, passengers, & conduct aeromedical evacuation. The KC-X will also be equipped with defensive systems to enhance its utility to the warfighter.

The KC-X program is based on a planned purchase of 179 aircraft and is the first of up to three recapitalization programs to replace the entire legacy fleet. The Air Force has budgeted approximately \$3.5 billion per year for a projected annual production rate of 12-18 aircraft. But even with this level of investment, it will take several decades to replace the 400+ KC-135s. Given the age of the fleet and the time required to recapitalize, it is absolutely critical for the Air Force to move forward now on this program.²⁹

Industrial Base

Employment Effects as Asserted for 2007-2008 Competition

Boeing's plan for the 2007-2008 KC-X competition called for 767s to be assembled at the Boeing plant in Everett, WA and be converted into tankers (KC-767s) at Boeing's plant in Wichita, KS. Boeing claimed that 44,000 U.S. workers from 300 U.S. suppliers would be involved in building the KC-767.³⁰

The Northrop/EADS plan for the 2007-2008 KC-X competition called for assembling its KC-X (originally called the KC-30, and later the KC-45) at a new plant planned for Mobile, AL. Northrop/EADS stated that assembling KC-Xs there would create 2,000 new jobs. Northrop originally stated that its proposal would result in 25,000 direct and indirect U.S. jobs—a calculation that Northrop/EADS stated was based a Department of Commerce employment model. Subsequently, Northrop raised its job estimate to approximately 48,000 direct and indirect jobs and 230 suppliers from 49 states. Northrop based the revised estimate on feedback received from suppliers and a Department of Labor employment model.³¹ In January 2008, EADS

(...continued)

House Armed Services Air & Land Forces and Seapower & Expeditionary Forces Subcommittees [Hearing] On the State of the Command, February 25, 2009, pp 6-7.

²⁹ Department of the Air Force, Presentation to the House Armed Services Committee Subcommittee on Air and Land Forces, United States House of Representatives, Combined Statement of: Lieutenant General Daniel J. Darnell, Air Force Deputy Chief Of Staff For Air, Space and Information Operations, Plans And Requirements (AF/A3/5) Lieutenant General Mark D. Shackelford, Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ) Lieutenant General Raymond E. Johns, Jr., Air Force Deputy Chief of Staff for Strategic Plans And Programs (AF/A8), May 20, 2009, p. 17.

³⁰ Boeing press release, "Boeing KC-767 Tanker Win Would Benefit Arizona Economy," November 26, 2007.

³¹ Press release, "Northrop Grumman Updates Job Projections for Air Force KC-45A Program," March 11, 2008, available online at http://www.irconnect.com/noc/press/pages/news_releases.html?d=138001.

announced that it would conduct final assembly of all commercial freighter versions of the Airbus 330-200 at the Mobile, AL, facility, increasing the potential number of new jobs that would be created at Mobile if the Northrop/EADS KC-X were selected.³²

Domestic Content as Discussed in 2007-2008 Competition

In the 2007-2008 KC-X competition, some observers questioned whether the Northrop/EADS proposal satisfied requirements in the Buy American Act, which requires the federal government to purchase domestically manufactured goods. The statute defines goods to have been domestically manufactured if their components have “substantially all” been mined, produced, or manufactured within the United States.³³ The definition of “substantially all” has been left to the Federal Acquisition Regulations (FAR). In the FAR, a good is considered “domestic” if the cost of domestically produced components exceeds 50% of the value of the whole article.³⁴

One way a KC-X contractor could potentially satisfy requirements of the Buy American Act is by having 50% or more of total cost of their proposed aircraft produced in the United States. Reportedly, approximately 85% of Boeing’s KC-X in the 2007-2008 competition would have been manufactured in the United States.³⁵ Northrop/EADS stated that “at least 58 percent” of its proposal in the 2007-2008 KC-X competition would be comprised of products manufactured by U.S.³⁶ For a listing of Boeing 767 and Airbus A330 suppliers, see **Appendix D**.

FY2009 Legislative Provisions

The FY2009 defense authorization act (S. 3001/P.L. 110-417 of October 14, 2008) contained three provisions relating to Air Force tanker aircraft:

- Section 131 amended an earlier provision—Section 135(b) of the FY2007 defense authorization act (H.R. 5122/P.L. 109-364 of October 17, 2006)—to require the Air Force to maintain at least 74 of the KC-135Es that are retired by the Air Force after September 30, 2006, in a condition that would allow recall of that aircraft to future service in the Air Force Reserve, Air National Guard, or active forces aerial refueling force structure. (Section 135(b) had originally required that each KC-135E retired after September 30, 2006, be maintained in such a condition.)
- Section 132 repealed Section 135 of the FY2004 defense authorization act (H.R. 1588/P.L. 108-136 of November 24, 2003)—the provision discussed earlier (see

³² Jen DiMascio, “Airbus Vows to Boost Business in Alabama If it Can Make Tankers There,” *Defense Daily*, January 15, 2008. Some observers have estimated a market for 200 Airbus 330-200 freighters over the next 10 years. As of January 2008, Airbus had orders for approximately 60 aircraft. (“Airbus 330,” Jane’s All the World’s Aircraft, February 19, 2008, available online at <http://www.janes.com>.)

³³ For more information on the Buy American Act, see CRS Report 97-765, *The Buy American Act: Requiring Government Procurements to Come from Domestic Sources*, by John R. Luckey.

³⁴ FAR § 25.101.

³⁵ Eric Rosenburg, “Boeing Duels for Tanker Deal,” *Seattle Post-Intelligencer*, September 30, 2007, available online at http://seattlepi.nwsource.com/business/333751_tanker01.html.

³⁶ “Northrop Grumman’s KC-45 Tanker: Making the Right Choice,” January 25, 2007, available online at <http://www.northropgrumman.com/kc45/benefits/choice.html>.

“Leasing and Purchasing Authority of 2003”) that authorized the Secretary of the Air Force to lease up to 20 tankers, and to use a multiyear procurement (MYP) arrangement beginning as early as FY2004 to procure up to 80 tankers using incremental funding.

- Section 133 required the Secretary of Defense to submit a report to the congressional defense committees by March 1, 2009, regarding the KC-X competition was terminated on September 10, 2008.

The text of Section 133 is as follows:

SEC. 133. REPORTS ON KC-(X) TANKER AIRCRAFT REQUIREMENTS.

(a) Report Required- Not later than March 1, 2009, the Secretary of Defense shall submit to the congressional defense committees a report regarding the competition for the KC-(X) tanker aircraft that was terminated on September 10, 2008. The report shall include the following:

(1) An examination of original requirements for the KC-(X) tanker aircraft, including an explanation for the use of the KC-135R tanker aircraft as the baseline for the KC-(X) tanker aircraft.

(2) A summary of commercial derivative or commercial off-the-shelf aircraft available as potential aerial refueling platforms using aerial refueling capabilities (such as range, offload at range, and passenger and cargo capacity) in each of the following ranges:

(A) Maximum gross take-off weight that is less than 300,000 pounds.

(B) Maximum gross take-off weight in the range from 301,000 pounds maximum gross take-off weight to 550,000 pound maximum gross take-off weight.

(C) Maximum gross take-off weight in the range from 551,000 pounds maximum gross take-off weight to 1,000,000 pound maximum gross take-off weight.

(D) Maximum gross take-off weight that is greater than 1,000,000 pounds.

(b) Reassessment Required- The Secretary of Defense shall reassess the requirements for aerial refueling that were validated by the Joint Requirements Oversight Council on December 27, 2006. Not later than 30 days after the reassessment, the Secretary shall submit to the congressional defense committees a report containing the complete results of the reassessment.

Issues for Congress

The issue for Congress in FY2010 is whether to approve, reject, or modify the Administration’s request for FY2010 research and development funding for the new KC-X program, and whether to take any action to define the acquisition strategy for the new KC-X program. Key acquisition-strategy issues include whether to procure one KC-X design or two, and (if only one design is to be procured, as the Administration prefers), how to structure and conduct the competition for determining the winning design.

Build One Design Or Two?

The Administration wants to build only one KC-X design. Some observers, including some Members of Congress, have expressed interest building two designs (i.e., both a Boeing and Northrop/EADS design).

Summary of Arguments

The Administration and other supporters of building a single design could argue one or more of the following:

- Building two designs would increase KC-X development costs by requiring the development of two aircraft, increase KC-X procurement costs by splitting the production learning curve for the program between two sources, and increase KC-X life-cycle operating and support costs by requiring the Air Force to maintain two sets of KC-X training, maintenance, and support, facilities. Air Force Secretary Michael Donley testified to the Senate Appropriations Committee on June 4, 2009, that procuring two KC-X designs would nearly double the program's estimated \$35 billion procurement cost.³⁷ If two KC-X designs are built, the Air Force for some time will bear the costs of operating four different types of tankers—KC-135s, KC-10s, and the two KC-X designs.
- KC-X procurement costs will be constrained (and KC-X production quality and schedule adherence will be maintained) with production of a single design because the KC-X builder will understand that its performance in building KC-Xs will influence DOD thinking on whether to use that firm to build KC-Ys and KC-Zs, or to execute other DOD acquisition programs. Since tankers are based on commercial airliners, building a single KC-X design now will not prevent DOD from holding an effective competition in future years for KC-Ys and KC-Zs.
- DOD cannot afford to procure more than about 18 KC-Xs per year without reducing funding for other defense programs, so producing a second KC-X design for the purpose of being able to produce more than 18 KC-Xs per year is not important.
- DOD has learned lessons from the 2007-2008 KC-X competition, and consequently will be able to structure and conduct a new KC-X competition that is fair to both sides and whose result, if challenged, will be upheld by GAO.

Supporters of building two designs could argue one or more of the following:

- Building two designs would permit annual competition in the production of KC-Xs, which will constrain KC-X procurement costs (and ensure production quality and schedule adherence) more effectively than using single source to produce all KC-Xs.³⁸ The Navy is contemplating continued production of its two Littoral

³⁷ See, for example, Marina Malenic, "Air Force Says Tanker Split But Would Nearly Double Program Cost," *Defense Daily*, June 5, 2009: 1-2.

³⁸ Among those who make this argument is Jacques Gansler, who served as Under Secretary of Defense for Acquisition, Technology and Logistics during the Clinton Administration, believes competitive dual sourcing is a good (continued...)

Combat Ship (LCS) designs in part for this reason.³⁹ The 2006 RAND analysis of alternatives for the KC-X found that, “a mixed [Air Force tanker] fleet ... has

(...continued)

fit for the KC-X program, since both competing aircraft already have established worldwide logistics networks. Gansler in 2006 compared cost growth for ten DOD aircraft programs developed without production competition to the cost of seven commercial aircraft produced in a competitive environment. He found that the ten single-source DOD acquisition programs had an average cost increase of 46%, while the seven competitively produced commercial airliners had an average cost decrease of 16% over the life of the program. For the KC-X program, Gansler assumed a purchase of 100 new tankers with a base price of \$125 million dollars and a 75/25 split favoring the best-value candidate. (Gansler’s analysis considered a 75/25 split to be illustrative and found other splits such as 60/40, etc. could be expected to produce similar savings.) Based on these assumptions, he found a competitively sourced tanker acquisition would potentially generate \$7.7 billion in cost savings compared to a single-source tanker program, provided the cost growth averages of the single-source and competitively sourced aircraft programs examined earlier in his study were repeated in the KC-X program. (Jacques S. Gansler and William Lucyshyn, “Competition in the USAF Tanker Replacement Program,” presentation slides, June 12, 2006, slides 18-19, 24, 35, and 40.)

John Lehman, who was Secretary of the Navy during the Reagan Administration and is a strong supporter of using competition in procurement, cited Gansler’s study in a June 8, 2009, opinion column advocating the use of competition in the KC-X program. The column also stated:

One such opportunity [for improving defense acquisition] is the current competition to replace the 45-year-old U.S. Air Force tanker fleet. This is a source selection between Boeing and Northrop Grumman conducted to award another 40 years of competition-free monopoly to the winner of the beauty contest. Under these Pentagon rules, the contestants are judged on which can produce the best fantasy about how low their prices will be in future decades, free of competition, producing their wondrous but still unbuilt airplane....

The air tanker program is a perfect candidate to return to the competitive cost control of yore. Bureaucrats will argue against it for the following reasons:

- With a planned buy of only 179 it is not big enough to split. No. The Navy got huge benefits from competing frigates, destroyers, cruisers and submarines with total numbers far lower than the tanker.
- Split competition requires freezing designs and fixed-price contracts, which prevents change orders. Yes.
- Operating and maintaining two types of aircraft is more difficult and costly than one. No. The Air Force proved that wrong when they made the case for expeditionary air wings now successfully operating five or more different aircraft types.
- The two candidates, the A330 and B767 derivatives, are too different to compete apples to apples. No. It is easy to normalize range/payload/etc. to compete fairly every year with different airplanes.
- Managing two contractors is more work than one. Yes.

In such a common-sense procurement, the government gets huge benefits: Just as in the “Toyota culture” of constant innovation, the two contractors will be under constant pressure to improve ideas and productivity, knowing their competitor is doing the same, and the price can be expected to drop each year.

In past successful split programs, the final design was locked, so the contractors could bid fixed-price. As technology advanced, there were block upgrades after two to five years where the design specifications were modified to incorporate innovations; the new design was frozen again until the next block upgrade.

(John Lehman, “When 2 Is Cheaper Than 1,” *DefenseNews.com*, June 8, 2009.)

³⁹ For more on the LCS program, see CRS Report RL33741, *Navy Littoral Combat Ship (LCS) Program: Background, Oversight Issues, and Options for Congress*, by Ronald O'Rourke

comparable cost-effectiveness, so there is no reason to exclude a priori an Airbus-Boeing mixed buy on cost-effectiveness grounds.”⁴⁰

- Producing two KC-X designs will enhance DOD’s potential for using competition in the future for the procurement of KC-Ys and KC-Zs,
- Building two designs would make possible a combined annual KC-X production rate at the Boeing and Northrop/EADS facilities of up to 36 aircraft per year, which would permit the Air Force to replace KC-135s more quickly, reducing the risk that KC-135s might reach the end of their service lives before they are replaced, and reducing more quickly KC-135 maintenance costs.
- In light of past difficulties in structuring and conducting a KC-X competition that is fair to both sides, building both designs would permit the KC-X program to proceed more expeditiously.

Potential Intermediate Alternative Building One Design at Two Sites

An alternative to building one design or two would be to have the two competitors build a single design—an approach that the Navy uses for the production of surface combatants and attack submarines. Under this approach, DOD would select a single design to build (either the Boeing design or the Northrop/EADS design), and that design would be built by both Boeing and Northrop/EADS. Advocates could argue that this approach would avoid the added development and operation and support costs associated with building two designs, and that if each KC-X were produced jointly by Boeing and Northrop/EADS (similar to how each Virginia-class attack submarine is built jointly by General Dynamics and Northrop),⁴¹ it could avoid some of the added costs of splitting the production learning curve between two sites. Advocates could also argue that having both firms build a single design would provide a potential for building up to 36 KC-Xs per year, should policymakers determine that such a rate is affordable.⁴²

Terms for a Competition

If a single KC-X design is to be built, an additional issue for Congress is how DOD should structure and conduct the competition so as to ensure that it fair to both sides and will withstand any protest by the losing bidder.

Lowest Price vs. Best Value

One issue is whether DOD should select the winning design on the basis of lowest cost (and technically acceptable) or best value. The question is significant because some observers believe that a selection based on lowest cost might be more likely to favor one design, while a selection based on best value might be more likely to favor another. Advocates of a competition based on

⁴⁰ Michael Kennedy et al., *Analysis of Alternatives (AoA) for KC-135 Recapitalization, Executive Summary*, RAND Corporation, 2006, p. 12.

⁴¹ For a discussion of the joint production approach for Virginia-class attack submarines, see CRS Report RL32418, *Navy Attack Submarine Procurement: Background and Issues for Congress*, by Ronald O'Rourke

⁴² For an article discussing the possibility of building one KC-X design at multiple sites, see John M. Doyle, “Rep. Taylor Suggests Multiple Tanker Assembly Sites,” *Aerospace Daily & Defense Report*, May 20, 2009: 5.

lowest cost might argue that it would be easier to design and implement, and easier to defend in the event of a protest.⁴³ Advocates of a competition based on best value might argue that it would have a higher likelihood of taking into account considerations that are not strictly cost related, but nevertheless important to meeting Air Force requirements for its future tanker fleet

Performance Requirements and Evaluation Factors

An additional question regarding the terms of the competition concerns the performance requirements for the KC-X and the evaluation factors that will be used in the KC-X competition. A March 6, 2009, news report stated:

The restart of the Air Force next-generation tanker competition took a major step forward last week when the Joint Requirements Oversight Council revalidated the program's requirements, according to defense officials.

⁴³ A May 1, 2009, news article that provided a perspective in favor of basing the decision on lowest cost stated:

The Pentagon should set price above bonus capabilities when selecting a winner in the \$35 billion competition to build a new fleet of aerial-refueling aircraft, the military's former top acquisition official said this week in his last hours on the job.

Meeting with reporters on his last day on the job—April 27—Pentagon acquisition chief John Young said this method would generate less controversy and be less burdensome on taxpayers. Young's successor, Ashton Carter, took the oath of office later that day.

“The government could possibly go and successfully have a best-value competition on tanker, but not with 800 requirements, almost all of which are tradeable,” Young said during the April 27 meeting at the Pentagon. “To successfully do that, the government is going to have to articulate ... a smaller set of requirements and be crystal clear about the relative priorities of those requirements.”

Last fall, a military official laid out two courses of action the Pentagon could take when awarding a contract. The first is called “lowest price, technically acceptable,” and the second, “best value.”

The first strategy requires a bidder to meet a number of threshold requirements. If those benchmarks are met, the final decision is made based on price. The second strategy requires bidders to meet the threshold requirements and a number of supporting requirements. The decision is made by who meets the most secondary requirements.

Since last fall, Air Force requirements and acquisition officials have been working to whittle down the massive list of tanker requirements. A lack of clarity in the lengthy list is what ultimately led the Government Accountability Office to sustain a protest filed by Boeing, which lost the competition to Northrop Grumman-EADS in February 2008.

In March, Inside the Air Force reported that the service had nearly halved the number of “evaluation elements” it will use when evaluating proposals for the KC-X tanker.

“I think the government can successfully go down that route and succeed, but there's no question it could be controversial,” Young said this week.

If both competitors meet the desired requirements, the Pentagon should ultimately choose the less expensive proposal, he said.

“If they are technically acceptable—[and] meet the requirements—ask people for their best price to meet those requirements and pick [a winner] that way,” Young said. “That gets the best deal for the taxpayer.

“I'm struggling to see what the downside of that is,” he continued. “I think, given the clearly demonstrated propensity for controversy in this space, you may have to go to those strategies.”

Taking his views a step further, Young said he penned a memo to acquisition officials noting this best-price strategy could prove useful when evaluating future competitions. In some cases, the Pentagon is paying more for capabilities it does not need.

“Once I have something that meets my articulated, prioritized technical requirements, I ought to go get the best price for the taxpayer,” he said. “What is the downside to that?”

(Marcus Weisgerber, “Young Claims USAF Should Make Price Top Factor In KC-X Competition,” *Inside the Air Force*, May 1, 2009.)

The JROC—chaired by Vice Chairman of the Joint Chiefs of Staff Marine Corps Gen. James Cartwright—discussed the KC-135 tanker replacement program during a Feb. 26 meeting at the Pentagon, according to sources. At press time (March 5), a JROC memorandum had not been signed, according to one defense official.

The JROC must validate a requirement before a major, high-budget program enters the acquisition phase.

“The requirement didn’t change,” Air Mobility Command chief Gen. Arthur Lichte told reporters last week when speaking about the tanker competition, not the JROC meeting....

Over the last few months, AMC requirements officials have been refining a list of more than 800 sub-requirements that were part of the original request for proposals

“We’ve gone back over and scrubbed them so as to make sure that, when we put a requirement out there, we didn’t make too many sub-requirements,” Lichte said at the same conference in Florida.

“We want to make sure we’re specific where we need to be specific [and] consolidate some of those requirements,” he said during a Feb. 26 briefing.

For instance, “if we wanted defensive systems, we could describe that in maybe 25 different requirements,” Lichte said, noting a cleaned -up version could instead state the new tanker needs a Large Aircraft Infrared Countermeasure system.

“I think we’ve got [the requirements] to the right level and now we’re waiting for OSD to make the final decision and to go forward with whatever acquisition strategy that we’re going to have,” he said.⁴⁴

A March 20, 2009, news report stated:

The Air Force has simplified the evaluation factors it plans to use when it re-examines bids for the KC-X next-generation tanker replacement program, according to service officials. This comes as Defense Secretary Robert Gates this week reaffirmed his position against buying two different aerial refueling aircraft.

Service officials hope trimming more than 800 “evaluation elements” will “clarify and condense” the new request for proposals, making it “more understandable to solicitors,” one service official said this week.

“We’re somewhere around half of the evaluation elements that we had before,” the official said. “I think industry will find a much clearer depiction of what it is we’re asking for, but the basic requirements have not changed.”

Air Force officials briefed the Joint Requirements Oversight Council late last month on the service’s process for clarifying and condensing evaluation factors, according to the official. The panel reaffirmed the fundamental next-generation tanker requirements as stated in the analysis of alternatives and capabilities development document remain sound.

“Nothing has fundamentally changed,” the official said.

⁴⁴ Marcus Weisgerber, “JROC Revalidates Air Force KC-X Tanker Program Requirements,” *Inside the Air Force*, March 6, 2009.

At press time (March 19), the group has not issued a JROC memorandum.⁴⁵

Air Force or OSD Management of Competition

An additional question is whether the KC-X competition will be managed by the Air Force or by the Office of the Secretary of Defense.⁴⁶

Legislative Activity for FY2010

FY2010 Funding Request

The Administration's proposed FY2010 defense budget requests \$439.6 million in Air Force research and development funding to begin a new program for acquiring new 179 KC-X aerial refueling tankers. The requested funding is found in the Air Force's research development, test and evaluation (RDT&E) account in PE (i.e., program element, meaning line item) 0605221F, KC-X, Next Generation Aerial Refueling Aircraft.

FY2010 Defense Authorization Bill (H.R. 2647/S. 1390)

House

The House Armed Services Committee, in its report (H.Rept. 111-166 of June 18, 2009) on H.R. 2647, recommends approving the Administration's request for \$439.6 million in research and development funding for the KC-X program. (Page 190, line 88) The committee's report states:

KC-X

The committee notes that the KC-X program is planned to replace the Department of the Air Force's KC-135 aerial refueling tanker fleet, which now has an average aircraft age of 47 years. The committee also notes that the KC-X program has been subject to delays resulting from contractor protests to the Government Accountability Office, and believes that further delay in the acquisition of the KC-X aerial refueling tanker could jeopardize Department of Defense requirements for global mobility. Accordingly, the committee strongly urges the Department to include the necessary funds in its Future Years Defense Program to rapidly conduct source selection and to award a KC-X aerial refueling tanker contract as expeditiously as possible. (Pages 100-101)

The report also states:

KC-X tanker replacement program

⁴⁵ Marcus Weisgerber, "Air Force Simplifies KC-X Evaluation Factors That Will Appear In RFP," *Inside the Air Force*, March 20, 2009.

⁴⁶ For an article discussing the issue of who will manage the KC-X competition, see Amy Butler, "USAF Could Lose Oversight Of Next Tanker Duel," *Aerospace Daily & Defense Report*, May 18, 2009: 4.

The committee believes that the Department of Defense should implement measures to ensure competition throughout the lifecycle of the KC-X tanker replacement program to ensure that the program delivers the best capability to the warfighter and the best value to the U.S. Government. Accordingly, the committee urges the Secretary of Defense to utilize as many of the competitive measures specified in subsection (b) of section 202 of the Weapon Systems Acquisition Reform Act of 2009 (Public Law 111-23) as is practicable when developing the acquisition strategy and source selection plan. The committee notes that the intent of section 202 is to require the Secretary of Defense to plan for persistent competition to control program costs and improve the reliability of the KC-X tanker acquired by the Department throughout the program's lifecycle, including development, procurement, and sustainment. (Page 203)

Section 1032 of H.R. 2647 requires Secretary of Defense shall submit to the congressional defense committees a report on the force structure findings of the 2010 Quadrennial Defense Review (QDR). The report is to include the analyses used to determine and support the findings on force structure, and description of any changes from the previous quadrennial defense review to the minimum military requirements for major military capabilities. Regarding Section 1032, the committee's report states:

The committee expects that the analyses submitted will include details on all elements of the force structure discussed in the QDR report, and particularly the following:...

(3) A description of the factors that informed decisions regarding aerial refueling aircraft force structure, including: the modeling, simulations, and analyses used to determine the number and type of aerial refueling aircraft necessary to meet the national defense strategy; the force sizing constructs used including peak demand; the number and type of aerial refueling aircraft necessary to meet the national security objective; the changes made, and supporting rationale for the changes made, to the aerial refueling aircraft force structure from that proposed in MCS-05; and the operational risks associated with the planned aerial refueling aircraft fleet, based on requirements of combatant commanders, and measures planned to address those risks;... (Page 388)

Section 1044 of H.R. 2647 would repeal Section 1081 of the FY2008 defense authorization act (H.R. 4986/P.L. 110-181 of January 28, 2008), which directed the Secretary of the Air Force to conduct a pilot program of at least five years' duration to assess the feasibility and advisability of utilizing commercial fee-for-service air refueling tanker aircraft for Air Force operations. Regarding Section 1044, the committee's report states:

The committee is aware that the Air Force has conducted initial analysis to develop the program structure for the pilot program, based on two diverse options, and has received feedback from potential providers in the aviation industry. However, based on its review of data gathered to date, the committee is concerned that the pilot program will be a costly alternative with little operational benefit and is not in the best interest of the Air Force. (Page 391)

The committee's report also states:

Fee for Service Refueling

The budget request contained \$10.0 million for a fee-for-service refueling pilot program. The committee recommends eliminating the funds for the pilot program.

A provision is included elsewhere in this title [Section 1044] that would repeal the requirement to conduct a fee-for-service pilot program. (Page 284; see also page 282 for the recommended line-item reduction)

Senate

Division D of S. 1390 as reported by the Senate Armed Services Committee (S.Rept. 111-35 of July 2, 2009) presents the detailed line-item funding tables that in previous years have been included in the Senate Armed Services Committee's report on the defense authorization bill. Division D recommends approving the Administration's request for \$439.6 million in research and development funding for the KC-X program. (Page 687 of the printed bill, line 88) The committee's report states:

KC-X tanker replacement program

The committee regards the need to modernize the current fleet of KC-135 aerial refueling tanker aircraft as a vital national security priority and supports the KC-X tanker recapitalization program, as well as efforts by the Air Force both to maintain the existing fleet and augment capability with aerial fee-for-service, if it proves cost-effective under the pending pilot program. Given the troubled history of the program, the committee expects that the Department of Defense will pursue a process of procuring replacement tankers that will ensure that the joint warfighter receives the best capability at the best price. The committee believes that this can only be achieved by an acquisition strategy that does not pre-determine the outcome of the competition and a competition that is fair and open. In addition, the committee believes that, in accordance with the principles of the Weapon Systems Acquisition Reform Act of 2009 (Public Law 111-23) and as a means of improving contractor performance, the Department of Defense must ensure that the acquisition strategy of the KC-X program includes measures that ensure competition, or the option of competition, throughout the life cycle of the program, where appropriate and cost-effective. (Page 99)

Section 1058 of S. 1390 would amend Section 1081 of the FY2008 defense authorization act (H.R. 4986/P.L. 110-181 of January 28, 2008), which directed the Secretary of the Air Force to conduct a pilot program of at least five years' duration to assess the feasibility and advisability of utilizing commercial fee-for-service air refueling tanker aircraft for Air Force operations. The committee's report states:

The committee recommends a provision [Section 1058] that would provide an exemption to the 5-year limitation on multiyear contracts and make other minor changes to enable the Air Force to implement a fee-for-service air refueling support pilot program.

Section 1081 of the National Defense Authorization Act for Fiscal Year 2008 (Public Law 110-181) directed the Secretary of the Air Force to conduct a pilot program to assess the feasibility and advisability of utilizing commercial fee-for-service air refueling tanker aircraft for Air Force operations.

The Air Force has been working with the private sector to implement this pilot program. The Air Force has informed the committee that results from their formal request for information process indicate that a multiyear contract that exceeds the current 5-year limit would be necessary to promote adequate competition and reduce program costs. The Air Force needs to have authority to make commitments for the 8-year pilot program in order to issue a request for proposal. The Air Force also needs to be able to offer carriers insurance coverage

similar to that provided to civil reserve air fleet (CRAF) program partners. This provision would provide the Air Force with those authorities. (Page 179)

The text of Section 1058 is as follows:

SEC. 1058. MULTIYEAR CONTRACTS UNDER PILOT PROGRAM ON COMMERCIAL FEE-FOR-SERVICE AIR REFUELING SUPPORT FOR THE AIR FORCE.

(a) Multiyear Contracts Authorized- The Secretary of the Air Force may enter into one or more multiyear contracts, beginning with the fiscal year 2011 program year, for purposes of conducting the pilot program on utilizing commercial fee-for-service air refueling tanker aircraft for Air Force operations required by section 1081 of the National Defense Authorization Act for Fiscal Year 2008 (P.L. 110-181; 122 Stat. 335).

(b) Compliance With Law Applicable to Multiyear Contracts- Any contract entered into under subsection (a) shall be entered into in accordance with the provisions of section 2306c of title 10, United States Code, except that—

(1) the term of the contract may not be more than 8 years;

(2) notwithstanding subsection 2306c(b) of title 10, United States Code, the authority under subsection 2306c(a) of title 10, United States Code, shall apply to the fee-for-service air refueling pilot program;

(3) the contract may contain a clause setting forth a cancellation ceiling in excess of \$100,000,000; and

(4) the contract may provide for an unfunded contingent liability in excess of \$20,000,000.

(c) Compliance With Law Applicable to Service Contracts- A contract entered into under subsection (a) shall be entered into in accordance with the provisions of section 2401 of title 10, United States Code, except that—

(1) the Secretary shall not be required to certify to the congressional defense committees that the contract is the most cost-effective means of obtaining commercial fee-for-service air refueling tanker aircraft for Air Force operations; and

(2) the Secretary shall not be required to certify to the congressional defense committees that there is no alternative for meeting urgent operational requirements other than making the contract.

(d) Limitation on Amount- The amount of a contract under subsection (a) may not exceed \$999,999,999.

(e) Provision of Government Insurance- A commercial air operator contracting with the Department of Defense under the pilot program referred to in subsection (a) shall be eligible to receive government provided insurance pursuant to chapter 443 of title 49, United States Code, if commercial insurance is unavailable on reasonable terms and conditions.

Appendix A. Section 8159 of FY2002 Defense Appropriations Act

The text of section 8159 of the FY2002 defense appropriations act (H.R. 3338/P.L. 107-117 of January 10, 2002) is as follows:

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.

Appendix B. Section 135 of FY2004 Defense Authorization Act

The text of Section 135 of the FY2004 defense authorization act ((H.R. 1588/P.L. 108-136 of November 24, 2003) is as follows:

SEC. 135. PROCUREMENT OF TANKER AIRCRAFT.

(a) **LEASED AIRCRAFT**- The Secretary of the Air Force may lease no more than 20 tanker aircraft under the multiyear aircraft lease pilot program referred to in subsection (d).

(b) **MULTIYEAR PROCUREMENT AUTHORITY**- (1) Beginning with the fiscal year 2004 program year, the Secretary of the Air Force may, in accordance with section 2306b of title 10, United States Code, enter into a multiyear contract for the purchase of tanker aircraft necessary to meet the requirements of the Air Force for which leasing of tanker aircraft is provided for under the multiyear aircraft lease pilot program but for which the number of tanker aircraft leased under the authority of subsection (a) is insufficient.

(2) The total number of tanker aircraft purchased through a multiyear contract under this subsection may not exceed 80.

(3) Notwithstanding subsection (k) of section 2306b of title 10, United States Code, a contract under this subsection may be for any period not in excess of 10 program years.

(4) A multiyear contract under this subsection may be initiated or continued for any fiscal year for which sufficient funds are available to pay the costs of such contract for that fiscal year, without regard to whether funds are available to pay the costs of such contract for any subsequent fiscal year. Such contract shall provide, however, that performance under the contract during the subsequent year or years of the contract is contingent upon the appropriation of funds and shall also provide for a cancellation payment to be made to the contractor if such appropriations are not made.

(c) **STUDY OF LONG-TERM TANKER AIRCRAFT MAINTENANCE AND TRAINING REQUIREMENTS**- (1) The Secretary of Defense shall carry out a study to identify alternative means for meeting the long-term requirements of the Air Force for—

(A) the maintenance of tanker aircraft leased under the multiyear aircraft lease pilot program or purchased under subsection (b); and

(B) training in the operation of tanker aircraft leased under the multiyear aircraft lease pilot program or purchased under subsection (b).

(2) Not later than April 1, 2004, the Secretary of Defense shall submit a report on the results of the study to the congressional defense committees.

(d) **MULTIYEAR AIRCRAFT LEASE PILOT PROGRAM DEFINED**- In this section, the term ‘multiyear aircraft lease pilot program’ means the aerial refueling aircraft program authorized under section 8159 of the Department of Defense Appropriations Act, 2002 (division A of P.L. 107-117; 115 Stat. 2284).

(e) **SENSE OF CONGRESS**- It is the sense of Congress that, in budgeting for a program to acquire new tanker aircraft for the Air Force, the President should ensure that sufficient

budgetary resources are provided to the Department of Defense to fully execute the program and to further ensure that all other critical defense programs are fully and properly funded.

Appendix C. KC-X Competition of 2007-2008

This appendix provides additional information and discussion on the KC-X competition of 2007-2008.

Request for Proposal

In January 2007, the Air Force released its formal RFP for the KC-X acquisition program. Assistant Secretary of the Air Force Sue Payton reportedly emphasized that the Air Force had completed a rigorous review process for KC-X to ensure the RFP mirrors joint war-fighting requirements.⁴⁷ The RFP outlined nine primary key performance parameters:

- Air refueling capability
- Fuel offload and range at least as great as the KC-135
- Compliant Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) equipment
- Airlift capability
- Ability to take on fuel while airborne
- Sufficient force protection measures
- Ability to network into the information available in the battle space
- Survivability measures (defensive systems, Electro-Magnetic Pulse (EMP) hardening, chemical/biological protection, etc.)
- Provisioning for a multi-point refueling system to support Navy and Allied aircraft⁴⁸

In November 2007, Ms. Payton explained the evaluation criteria that the Air Force used in determining the KC-X competition. The KC-X evaluation factors are:

- Factor 1—Mission Capability. Mission capability includes five subfactors listed in descending order of importance:
 - Subfactor 1.1—Key System Requirements
 - Subfactor 1.2—Subsystem Integration and Software
 - Subfactor 1.3—Product Support
 - Subfactor 1.4—Program Management
 - Subfactor 1.5—Technology Maturity and Demonstration
- Factor 2—Proposal Risk

⁴⁷ “Air Force Posts KC-X Request for Proposals,” *Air Force Print News Today*, Press Release 070107, January 30, 2007, online at http://www.af.mil/pressreleases/story_print.asp?id=123039273.

⁴⁸ Ibid.

- Factor 3—Past Performance
- Factor 4—Cost/Price
- Factor 5—Integrated Fleet Air Refueling Assessment⁴⁹

The Air Force considered the first three KC-X evaluation factors of equal importance. The final two factors were considered of equal importance, but less important relative to the first three criterion. Lastly, the Air Force regarded “Factors 1, 2, 3, and 5, when combined, [to be] significantly more important than factor 4.”⁵⁰

Boeing Protest

Air Force officials debriefed both Boeing and Northrop officials on how their respective bids were scored in March 2008. On March 11, 2008, Boeing protested the Air Force’s decision to the GAO.⁵¹ On March 26, 2008, both the Air Force and Northrop separately filed motions for the GAO to dismiss portions of Boeing’s protest.⁵² GAO rejected these motions.⁵³ Work on the KC-45A stopped while the GAO considered the protest.⁵⁴

Boeing’s protest was based on a perception that the Air Force used a flawed process in the KC-X selection process. For example, in a press release detailing Boeing’s rationale for protesting, Boeing stated:

It is clear that frequent and often unstated changes during the course of the competition—including manipulation of evaluation criteria and application of unstated and unsupported priorities among the key system requirements—resulted in selection of an aircraft that was radically different from that sought by the Air Force.⁵⁵

Boeing stated that both teams received identical ratings across the five evaluation areas in the KC-X competition. Boeing claimed that the Air Force’s treatment of both Boeing’s cost estimates and Boeing’s past experience of building Air Force tankers, if scored differently, could have affected the outcome of the source selection.⁵⁶ In response to Boeing’s protest, an Air Force press release stated:

Proposals from both offerors were evaluated thoroughly in accordance with the criteria set forth in the Request for Proposals. The proposal from the winning offeror is the one Air Force officials believe will provide the best value to the American taxpayer and to the

⁴⁹ USAF slide obtained from “Performance Comes First,” Air Force Association Daily Report, November 21, 2007, online at <http://dailyreport.afa.org/AFA/Reports/2007/Month11/Day21/1028factors.htm>.

⁵⁰ Ibid.

⁵¹ Boeing News Release, “Boeing Protests U.S. Air Force Tanker Contract Award,” March 11, 2008, online at http://www.boeing.com/ids/globaltanker/news/2008/q1/080311b_nr.html.

⁵² Andrea Shalal-Esa, “Air Force, Northrop Ask GAO to Dismiss Boeing Protest,” *Reuters*, March 26, 2008.

⁵³ Susanna Ray and Edmond Lococo, “Northrop Loses Effort to Dismiss Boeing Protest,” *Bloomberg News*, April 2, 2008, online at <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a2hruo2xpyFQ>.

⁵⁴ Sean Reily, “Air Force Keeps Tanker Freeze,” *Mobile Press-Register*, March 18, 2008, online at <http://www.al.com/press-register/stories/index.ssf?/base/news/120583171412090.xml&coll=3>.

⁵⁵ Boeing Company News Release, “Boeing Protests U.S. Air Force Tanker Contract Award,” March 11, 2008, online at http://www.boeing.com/news/releases/2008/q1/080311b_nr.html.

⁵⁶ Ibid.

warfighter. Air Force members followed a carefully structured process, designed to provide transparency, maintain integrity and promote fair competition. Air Force members and the offerors had hundreds of formal exchanges regarding the proposals throughout the evaluation process. Air Force officials provided all offerors with continuous feedback through discussions on the strengths and weaknesses of their proposals. Several independent reviews assessed the process as sound and thorough.⁵⁷

GAO Ruling on Protest

On June 18, 2008, the GAO announced that it had completed its examination of DOD's decision to award Northrop the KC-X contract (for 80 aircraft) and found that Boeing's complaint had merit.⁵⁸ GAO's managing associate general counsel for procurement law, Michael R. Golden, stated:

Our review of the record led us to conclude that the Air Force made a number of significant errors that could have affected the outcome of what was a close competition between Boeing and Northrop Grumman. We therefore sustain Boeing's protest. We also denied a number of Boeing's challenges to the award to Northrop Grumman, because we found that the record did not provide us with the basis to conclude that the agency had violated the legal requirements with respect to those challenges.

GAO recommended that discussions between the government and the bidders be resumed, that bidders be given the opportunity to submit revised proposals, and that the Air Force make a new decision based on this additional input. The Air Force is not statutorily obliged to heed GAO's recommendations but must respond to them within 60 days (i.e., by August 17, 2008).⁵⁹

GAO made clear that it was not passing judgment on the relative merits of the proposed aircraft. Instead, GAO stated that it assessed whether the Air Force complied with statutory and regulatory requirements in evaluating the competing bids. GAO cited seven specific reasons for sustaining portions of the Boeing protest, which are summarized below:

1. The Air Force evaluation did not follow the prioritization of technical requirements specified in its own solicitation. Nor did it give credit to the Boeing proposal for satisfying the greater number of non-mandatory technical criteria, though the solicitation expressly requested this.
2. The Air Force used the degree to which the Northrop Grumman bid exceeded a specific key performance objective as an important discriminator between proposals, despite the solicitation's provision stating that this would not be the case.
3. Solicitation required that proposed tankers be able to refuel all fixed-wing, tanker-compatible Air Force aircraft using existing Air Force procedures. The protest record did not support the Air Force's determination that the Northrop Grumman proposal did so.
4. Air Force discussions with each of the bidding companies were unequal and misleading. Boeing was told that it had fully satisfied a key operational utility parameter, yet the Air Force later determined that the

⁵⁷ "Air Force Officials Respond to Boeing Protest," Air Force Print News Today, March 12, 2008, online at http://www.af.mil/news/story_print.asp?id=123089878.

⁵⁸ GAO, "Statement Regarding the Bid Protest Decision Resolving the Aerial Refueling Tanker Protest By The Boeing Company B-311344 et al.," Government Accountability Office (Washington, D.C.), June 18, 2008. Available on the World Wide Web at <http://www.gao.gov/press/boeingstmt.pdf>.

⁵⁹ GAO also recommended that the Air Force consider amending its proposal solicitation before engaging the companies in the discussions, that it reimburse Boeing for the cost of filing and pursuing the protest, and that it terminate the existing contract with Northrop Grumman if Boeing's proposal is ultimately selected.

Boeing proposal only partially met the requirement. The Air Force continued its discussion with Northrop Grumman on the same key parameter without informing Boeing that its assessment had changed.

5. Northrop Grumman refused to agree to a specific solicitation requirement regarding the development of Air Force maintenance capability within a specified period. The Air Force unreasonably assessed this to be an “administrative oversight” and awarded the contract improperly in light of this exception to a material solicitation requirement.
6. The Air Force unreasonably evaluated the military construction (hangers, runways, parking aprons, etc.) required to sustain each of the proposed aircraft. During the protest proceedings, the Air Force conceded that calculations properly performed would have resulted in a most probable life cycle cost for the Boeing offer lower than that for the Northrop Grumman proposal.⁶⁰
7. The Air Force improperly adjusted upward Boeing’s estimate of the non-recurring (i.e., one-time) engineering portion of its most probable life cycle cost value. The Air Force would have been able to do so had it found the cost to be unreasonably low, but it did not. Additionally, the cost model used by the Air Force to adjust this cost estimate was unreasonable.

⁶⁰ Life cycle cost refers to the total cost of owning, operating, maintaining, and disposing of a given asset. It is often referred to as “cradle-to-grave” cost. Life cycle costs are calculated within a range, from lowest to highest. The “most probable” cost is the one calculated to have the statistically highest probability of being true.

Appendix D. Boeing 767 and Airbus 330 Suppliers

Table D-I. Boeing 767 Suppliers

Supplier	Parent Country	Component(s)
Aero Vodochody	Czech Republic	airframe parts (for BAE Systems)
Alenia	Italy	wing control surfaces, flaps and leading-edge slats, wingtips, elevators, fin rudder, nose radome
Avcorp	Canada	front and rear spar stiffeners, floor grid details and assemblies, aft strut fairings
Boeing Canada	Canada	fixed trailing edge panels, composite wing-to-body fairings, engine strut fairings
Bombardier (Learjet)	Canada	wing trailing edge support structures
Bombardier (Canadair)	Canada	rear fuselage, pressure bulkhead
Daido Steel	Japan	steel sheets
Embraer	Brazil	flap supports
Fuji	Japan	wing fairings, main landing gear doors
Fujukawa Aluminum	Japan	forgings and extensions
GKN Aerospace (Westland Aerospace, formerly BP Chemicals; with Lucas Aertspace Cargo Systems)	United Kingdom	flap track fairings
Goodrich (Cleveland Pneumatic)	United States	main landing gear
Hitco Carbon Composites	United States	flap track fairings
IPTN	Indonesia	flaps, keel beams (for Mitsubishi)
Kaman Aerospace	United States	wing trailing edges
Kawasaki Heavy Industries	Japan	center-fuselage body panels, exit hatches, wing in-spar ribs
Korean Aerospace (Samsung)	Republic of Korea	wing trailing edges
LMI Aerospace	United States	skins, wing panels, floor beams, curtain tracks
Lunn Industries (Alcore)	United States	leading edge slat core assemblies (for ASTA)
Menasco Aerospace	United States	nose landing gear unit
Mitsubishi Heavy Industries	Japan	rear fuselage body panels, stringers, passenger and cargo doors, dorsal fin
Nihon Kokuki (Nippi)	Japan	wing in-spar ribs, various structural components for Mitsubishi
PPG Industries	United States	landing light lens assemblies, cockpit windows
Shin Meiwa	Japan	tailplane trailing edges (for Northrop Gumman/Vought)

Source: Teal Group

Note: Commercial variants powered by engines manufactured by either General Electric, Pratt & Whitney, or Rolls Royce.

Table D-2. Airbus 330/350 Suppliers⁶¹

Supplier	Parent Domicile	Component(s)
Advanced Technology and Research (ATR) Corp.	United States	graphite epoxy underwing fairings (for Aerostructures Corp.)
Aerostructures Corp. (Now Vought)	United States	inner spoilers/airbrakes, center spar, upper wing skin panels, inner and outer wingbox leading edge assemblies (for BAE), outer flaps, flap track shrouds, spoiler parts (for DASA-EADS)
AHF-Ducommun	United States	leading edge wing skins
Boeing (Aerospace Technologies of Australia)	United States	main gear doors, floor support structure, pressurization bulkhead between passenger cabin, main landing gear compartment (for Aérospatiale-EADS)
Bombardier (Canadair)	Canada	leading edge wing assemblies, nose gear bay and doors, nose bottom fuselage, rear sealed frame, ventral beam, pressurized lateral floor, aft pressure bulkhead (for Aérospatiale-EADS), inboard front spar assembly (for BAE)
BTR Aerospace	Canada	main landing gear fairings
CC Industries	United States	outer rear spar, main landing gear support, ribs (for BAE)
Ciba-Geigy Corp.	Federal Republic of Germany	HTA/6376 prepreg on wings
Dowty Aerospace Canada	Canada	center landing gear
Dowty Rotol (with Cleveland Pneumatic)	United Kingdom	design and manufacture of main landing gear
Fairchild Dornier	Federal Republic of Germany	fuselage and wing components, interior panels
Fischer Advanced Composite Components	Federal Republic of Germany	interior components (for DASA-EADS)
GKN Aerospace (formerly BP Advanced Materials)	United Kingdom	composite panels (for BAE)
General Engineering	Unknown	side stay fairing
Hawker de Havilland, Australia	Australia	wingtips, winglets, wing root fillet, ribs (for BAE)
Heath Techna Aerospace	United States	composite components (for BAE)
IPTN	Indonesia	flap track carriages, sheet metal parts (for BAE)
Korean Aerospace Industries (Daewoo)	Republic of Korea	wing components
Korean Air (with Silat)	Republic of Korea	upper fuselage panels of Section 15 (for Aérospatiale-EADS)
Marion Composites	United States	flap track fairings (for Aerostructures Corp.)

⁶¹ The Airbus 350 is a planned model that will be similar in size to the Airbus 330. It was originally expected to be a derivative of the Airbus 330, but is now expected to be a new design aircraft.

Supplier	Parent Domicile	Component(s)
Marvin Group	United States	large ribs (for BAE)
Messier-Hispano-Bugatti	France	nose landing gear, wheels and brakes (option)
Mitsubishi Heavy Industries	Japan	cargo doors
PPG Industries	United States	cockpit windows
RTI International Metals	United States	titanium on A350
SABCA	Belgium	tailcones (for DASA)
Shin Meiwa	Japan	wing fairings
Socea	France	rear upper panels of center fuselage section
SOCATA	France	composite belly fairing
SONACA	Belgium	full-span leading edge slats, slat tracks
Xian Aircraft Co. (AVIC-I)	Peoples Republic of China	avionics access doors

Source: Teal Group

Note: Commercial variants of both aircraft types are powered by engines manufactured by either General Electric, Pratt & Whitney, or Rolls Royce.

Appendix E. Potential Longevity of KC-135 Fleet

2004 DSB Report and 2006 RAND Analysis

A 2004 Defense Science Board (DSB) task force report examined, among other things, the potential longevity of the KC-135 fleet.⁶² The 2006 RAND Analysis of Alternatives (AOA) on aerial refueling also examined the technical condition of the KC-135 fleet.

The DSB report stated that airframe service life, corrosion, and maintenance costs factors would potentially determine the KC-135s operational life expectancy. Each of these factors is discussed briefly below.

Airframe Service Life

KC-135s, along with their associated B-52 bombers, were originally purchased to give the United States a strategic nuclear strike capability. As a result, both fleets of airplanes spent a significant amount of time during the Cold War on ground alert. Consequently, in 2004, the average KC-135 airframe had flown only about 17,000 hours of an estimated service life of 36,000 hours (KC-135E) or 39,000 hours (KC-135R). On this basis, the DSB report concluded that KC-135 airframes were viable until 2040 at “current usage rates.”⁶³ The 2006 RAND AOA similarly concluded that the KC-135 fleet “can operate into the 2040s,” but not without risks.⁶⁴

Corrosion

The 2004 DSB report concluded that corrosion did not pose an “imminent catastrophic threat to the KC-135 fleet” and that the Air Force’s maintenance practices were postured “to deal with corrosion and other aging problems,”⁶⁵ but also stated:

However, because the KC-135s are true first generation turbojet aircraft designed only 50 years from the time man first began to fly, concerns regarding the ability to continue operating these aircraft indefinitely are intuitively well founded.⁶⁶

Maintenance Costs

A 2004 GAO report stated that KC-135 flying hour costs increased in real (i.e., inflation-adjusted) terms by 29% between 1996 and 2002.⁶⁷ The DSB report agreed that KC-135 maintenance costs had increased significantly, but found that they had leveled off due to Air Force changes in KC-

⁶² *Defense Science Board Task Force Report on Aerial Refueling Requirements*, May 2004, p. iv.

⁶³ *Ibid.*

⁶⁴ Michael Kennedy et al., *Analysis of Alternatives (AoA) for KC-135 Recapitalization, Executive Summary*, RAND Corporation, 2006, pp. 15-16.

⁶⁵ *Defense Science Board Task Force Report on Aerial Refueling Requirements*, May 2004, p. iv.

⁶⁶ *Ibid.*, p. 17.

⁶⁷ General Accounting Office, *Military Aircraft[:.] DOD needs to Determine Its Aerial Refueling Requirements*, GAO-04-439, June 2004, p. 13.

135 depot processes. The DSB report forecasted modest growth in maintenance costs in the future.⁶⁸

Risks Of Flying Older Aircraft

Some observers express about potential problems that may arise in flying 50- to 80-year-old tankers that could possibly ground the entire KC-135 fleet. The DSB report examined the issue and concluded that “although grounding is possible, the task force assesses the probability as no more likely than that of any other aircraft in the inventory of the Services.”⁶⁹ The 2006 RAND analysis expressed a belief that it is possible that KC-135s will be able to operate into the 2040s, but the report expressed a lack of confidence that KC-135s could continue to be operated that long without risks of major maintenance cost increases, poor fleet availability, or possible fleet-wide grounding. The RAND analysis concluded that “the nation does not currently have sufficient knowledge about the state of the KC-135 fleet to project its technical condition over the next several decades with high confidence.”⁷⁰ The analysis recommended more thorough scientific and technical study of the KC-135 to provide a more reliable basis for future assessments of the condition of the KC-135 fleet.⁷¹

2009 News Reports on 2001 DOD Study

A March 13, 2009 news report on a 2001 DOD study on the KC-135 fleet stated:

The cost of maintaining geriatric KC-135 Stratotankers into the 2040s will likely increase nearly 50 percent over the next 30 years to account for major structural and engine improvements needed simply to keep the venerable aircraft flying, according to documents obtained by *Inside the Air Force*.

The overall annual maintenance will rise from \$2.1 billion in fiscal year 2001 to \$3 billion in 2040, according to the KC-135 Economic Service Life Study. In all, it will cost the Air Force more than \$103 billion to operate and maintain Stratotankers between 2001 and 2040—almost triple the cost of buying nearly 200 new KC-X refuelers, according to the report, which makes its projections using calendar year 2000 dollar amounts....

This is the first time the results of the 2001 study have been reported in full, although some details have been referenced in a number of Congressional Research Service reports.

The study was conducted before the major boom in tanker missions following the Sept. 11, 2001, terrorist attacks. Since then, tanker missions have increased dramatically to support combat operations in Afghanistan and Iraq, in addition to refueling fighter jets that constantly patrol the skies over the United States as part of Operation Noble Eagle.

Air Force Materiel Command chief Gen. Arthur Lichte said he stands behind the 2001 study, claiming its predictions have been “right on the mark.”

⁶⁸ *Defense Science Board Task Force Report on Aerial Refueling Requirements*, May 2004, pp. iv-v.

⁶⁹ *Ibid.*, p. 18.

⁷⁰ Michael Kennedy et al., “Analysis of Alternatives (AoA) for KC-135 Recapitalization, Executive Summary,” RAND Corporation, 2006, p. 16.

⁷¹ *Ibid.*

“We have pretty high confidence that the things that [the study] suggested to do in the outyears will come true,” Lichte said during a Feb. 26 briefing with reporters at a conference in Florida.

While the “structural integrity of the KC-135 fleet remains strong,” costs associated with maintaining that level of integrity will contribute to the nearly \$1 billion jump in maintenance costs. In 2001, structure-related upkeep costs were reported at \$321 million. That specific maintenance will increase to \$1.1 billion annually in 2040, according to the report.

Overhauling the R-model tanker’s General Electric F108 engines over the next 30 years is expected to jump from \$13 million to \$66 million, the report states.

All KC-135s will need to have their outer skin replaced beginning in 2018 due to corrosion, according to the report and Lichte....

“Depot level airframe and engine maintenance are the primary cost drivers to sustain the KC-135 fleet through 2040,” the report states.⁷²

A March 6, 2009, news report stated:

Many of the Air Force’s geriatric, Eisenhower-era KC-135 tanker aircraft fleet will have to have their “skin” replaced beginning around 2018, according to the top general in charge of Air Mobility Command.

“There was an independent study ... that starts to look at ... the 2018 time frame and beyond—you need to start thinking about re-skinning the aircraft, the fuselage itself in the back” of the plane, Gen. Arthur Lichte said in a Feb. 26 briefing with reporters. The study was conducted in 2000 and published in February 2001.

Over the years, corrosion has built up where rivets hold the skin to the frame of the aircraft. Thus, the service will likely need to begin improvements late in the decade, he said, noting the study has been “right on the mark” with all of its other predictions.

“We have pretty high confidence that the things that [the study] suggested to do in the outyears will come true as well,” Lichte said.

The revelation comes as the Air Force awaits word from the Office of the Secretary of Defense on when to restart the service’s KC-X next-generation tanker competition. The Air Force has scrubbed its requirements for the aircraft so that they will be presented in a clearer fashion, according to Lichte....

In February 2005, then-Pentagon acquisition chief Michael Wynne asked for a paper detailing what technical and maintenance issues still needed to be addressed that are not part of a major KC-135 aircraft re-engine effort. A group of subject matter experts was then assembled to project future maintenance needs out to 2050. The study revealed 44 KC-135 repair issues.

⁷² Marcus Weisgerber, “Report: KC-135 Maintenance Could Reach \$3 Billion Per Year By 2040,” *Inside the Air Force*, March 13, 2009.

“This was a qualitative assessment that relied on engineering judgment, experience and historical data to estimate future sustainment needs,” according to documents provided by AMC.

Today it costs \$7 million for each KC-135 aircraft that goes through the maintenance depot every five years, according to Lichte. The service sends about 72 planes through the depot each year.

“If you can get rid of those [KC-]135s sooner, or have fewer to put through that time period of re-skinning, then you save some money,” he said.

In addition to new skin, the study found the planes will all need new wiring in the 2020s and 2030s. Also in the 2030s, a large portion of the depot maintenance remains unknown, according to the documents.⁷³

Author Contact Information

Ronald O'Rourke
Specialist in Naval Affairs
rorourke@crs.loc.gov, 7-7610

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⁷³ Marcus Weisgerber, “Air Force Will Likely Need to Re-Skin Its KC-135 In The 2018 Time Frame,” *Inside the Air Force*, March 6, 2009. Ellipses as in original.