Air Force C-17 Aircraft Procurement: Background and Issues for Congress

(name redacted)
Specialist in Military Aviation

April 6, 2010

Congressional Research Service
7-....
www.crs.gov
RS22763

CRS Report for Congress
Prepared for Members and Committees of Congress

Summary

A total of 223 C-17s have been procured through FY2010. The Administration's proposed FY2011 defense budget proposed to end C-17 procurement and did not request any funding for the procurement of additional C-17s. The Administration argues that enough C-17s have now been procured to meet future operational needs. Supporters of procuring additional C-17s in FY2011 believe additional C-17s will be needed to meet future operational needs. The issue of how much airlift capability will be needed in the future is currently being examined in a congressionally mandated study being done by the Institute for Defense Analyses (IDA) and in a separate Department of Defense (DOD) study called the Mobility Capabilities and Requirements Study 2016 (MCRS-16), which was due to be completed by the end of 2009.

FY2010 defense authorization bill: The conference report (H.Rept. 111-288 of October 7, 2009) on the FY2010 defense authorization act (H.R. 2647/P.L. 111-84 of October 28, 2009) authorizes no funding for the procurement of additional C-17s. Section 137 of the act prohibits the Secretary of the Air Force from proceeding with a decision to retire C-5As in any number that would reduce the active inventory of C-5s below 111 until certain conditions are met, and require the Secretary of the Air Force to submit a report to the congressional defense committees on the issue of C-5 retirement. Section 138 requires the Secretary of the Air Force, in coordination with the Director of the Air National Guard, to submit to the congressional defense committees, at least 90 days before a C-5 airlift aircraft is retired, a report on the proposed force structure and basing of C-5 and C-17 aircraft. Section 139 amends 10 USC 8062(g)(1) to state that the Secretary of the Air Force shall maintain a total inventory of not less than 316 C-5s and C-17s. If the current force of 111 C-5s were retained, this provision would support a C-17 force of not less than 205 C-7s—the number procured through FY2008.

FY2010 DOD appropriations bill: In lieu of a conference report, the House Appropriations Committee on December 15, 2009, released an explanatory statement on a final version of H.R. 3326. This version was passed by the House on December 16, 2009, and by the Senate on December 19, 2009, and signed into law on December 19, 2009, as P.L. 111-118.

The explanatory statement includes $2,588.5 million for procurement of 10 C-17s in 2010, an increase of $2,500.0 million over the administration request. The budget for modification of in-service C-17s is reduced in the statement by $17.4 million, from the request of $469.7 million to $352.3 million. As Congress decided to continue production, the Administration request for $91.4 million in post-production support was not funded.

The explanatory statement provides for the rescission of $22.4 million from Air Force research and development funds for the C-17 without further explanation.

Contents

Tables

Appendixes

Contacts

Introduction

Procurement of C-17 airlift aircraft began in FY1988, and a total of 223 have been procured through FY2010.

The Administration's proposed FY2011 defense budget proposed to end C-17 procurement and did not request any funding for the procurement of additional C-17s. Further, Secretary of Defense Robert Gates, in testimony to the Defense Subcommittee of the House Appropriations Committee, stated, "Should Congress add funds to continue this program, I will strongly recommend a presidential veto." The Administration argues that enough C-17s have now been procured to meet future operational needs.

Supporters of procuring additional C-17s in FY2011 believe additional C-17s will be needed to meet future operational needs. The issue of how much airlift capability will be needed in the future is currently being examined in a congressionally mandated study being done by the Institute for Defense Analyses (IDA) and in a separate Department of Defense (DOD) study called the Mobility Capabilities and Requirements Study 2016 (MCRS-16), which was due to be completed by the end of 2009.

The primary issue for Congress in FY2011 is whether to procure additional C-17s. An additional issue is whether to pass legislation relating to the airlift aircraft force structure. Congress's decisions on these issues could affect DOD capabilities and funding requirements and the U.S. military aircraft industrial base.

Background

C-17 Program

C-17 in Brief

The Air Force C-17, also known as the Globemaster III or simply the Globemaster, can transport equipment, supplies, and personnel over long distances, from one theater of operations to another, and can also land on more austere airfields with shorter runways. The C-17 complements the Air Force's larger and older C-5 Galaxy airlift aircraft in the strategic (i.e., inter-theater) airlift role, and smaller C-130 Hercules airlift aircraft in the tactical (i.e., intra-theater) airlift role.

Comparison with C-5

The C-5 and the C-17 can carry outsized (i.e., large-dimension) cargo items,[1] such as M-1 tanks. The C-5 can carry more cargo than the C-17 and has a longer unrefueled range than the C-17. Certain DOD cargo items, such as the Army's 74-ton mobile scissors bridge, are so large that they

[1] Outsize cargo items have dimensions that exceed 1,090 inches in length, 117 inches in width, or 105 inches in height. Somewhat smaller cargo items that exceed 96 inches in height but do not exceed 1,090 inches in length, 117 inches in width, or 105 in height are referred to as oversize cargo. Oversize cargo can be carried not only by the C-5 and C-17, but by other DOD airlift aircraft as well, such as the C-130.

can be carried only by a C-5. The C-17, however, can deploy cargo and personnel directly into more austere airfields with shorter runways.[2] The C-17 also costs less to operate per flight hour than the C-5 and has a higher mission capable rate (MCR), which is a measure of aircraft reliability. **Table 1**, adapted from a November 2009 GAO report, compares some characteristics of the C-17 and C-5.

Table 1. C-17 and C-5 Characteristics

Characteristic	C-17	C-5
Cargo	170,900 pounds	270,000 pounds
Troops	102	81
Unrefueled range	2,700 miles	6,320 miles
Minimum runway length	3,500 feet	6,000 feet
Speed	572 mph	518
Crew	3	7
Mission capable rate (2008)	86%	52%
Cost per flying hour (2008)	$12,014	$20,947

Source: Information taken from Figure 2 (page 27) of Government Accountability Office, *Defense Acquisitions[:] Strategic Airlift Gap Has Been Addressed, but Tactical Airlift Plans Are Evolving as Key Issues Have Not Been Resolved*, GAO-10-67, November 2009. GAO states that Figure 2 is based on GAO analysis of DOD data.

Program Origin and Milestones

The C-17 program began in the early 1980s.[3] Procurement of C-17s began in FY1988.[4] The first C-17 was delivered to the Air Force in June 1993. The C-17 achieved Initial Operational Capability (IOC), with the delivery of 12 aircraft to a C-17 squadron, in January 1995. A full-rate production contract was awarded in February 1996. The C-17 program experienced development challenges and cost growth in its earlier years that were the subject of congressional oversight at the time.

[2] In addition to being able to land on shorter runways, the C-17 is more maneuverable on the ground than the C-5, which permits a larger number of C-17s to use an airfield simultaneously for loading and offloading equipment.

[3] The source selection decision for the program was announced in August 1981. A contract for the program was awarded in July 1982. The program was given Milestone II approval, and Full Scale Engineering Development (FSED) began, in February 1985.

The C-17 program had a difficult time winning congressional support in the late 1970s, and C-17 development was delayed until initial funding was finally approved in FY1981. By 1982, DOD was concerned its airlift shortfall was too urgent to await development of a new plane and decided to purchase aircraft readily available for production. Congress approved funds in the FY1983 budget to purchase 50 additional C-5B cargo planes and 44 new KC-10 Extender aerial refueling aircraft to quickly bridge the airlift gap. Because DOD wanted to develop the C-17 and buy additional C-5s, Congress directed DOD to develop a comprehensive description of its future acquisition plans. The result was the Airlift Master Plan of September 1983, which compared several alternatives for modernizing the airlift fleet and concluded that the C-17 was the most cost-effective.

[4] The program was granted Milestone III approval, and low-rate initial production (LRIP) began, in January 1989. The first flight of a C-17 occurred in September 1991. Developmental test and evaluation began in September 1991 and was completed in December 1994; initial operational test and evaluation (IOT&E) began in December 1994 and was completed in June 1995.

Procurement Quantities

Table 2 shows annual C-17 procurement quantities, along with changes over time in the planned total number of C-17s to be procured. C-17s were procured under overlapping multiyear procurement (MYP) arrangements in FY1997-FY2003 and FY2003-FY2007.

Table 2. C-17 Procurement Quantities

Fiscal Year	Annual quantity requested	Annual quantity procured	Cumulative quantity procured	Planned total number to be procured under that year's budget submission
1988	2	2	2	210
1989	4	4	6	210
1990	4	4	10	120
1991	6	0	10	120
1992	4	4	14	120
1993	6	6	20	40
1994	6	6	26	40
1995	6	6	32	40
1996	8	8	40	120
1997	8	8	48	120
1998	9	9	57	120
1999	13	13	70	120
2000	15	15	85	120
2001	12	12	97	134
2002	15	15	112	137
2003	12	15	127	180
2004	11	11	138	180
2005	14	15	153	180
2006	15	15	168	180
2007	12	22[a]	190	180
2008	0	15[b]	205	190
2009	0	8[c]	213	190
2010	0	10	223	205
2011	0	TBD	TBD	223

Source: Prepared by CRS based on DOD data.

Notes: n/a = figures not available from online DOD budget data, and have been requested from the Air Force.

a. Ten of these 22 aircraft were funded in Title IX of the FY2007 DOD appropriations act (H.R. 5631/P.L. 109-289 of September 29, 2006)—the title that provided additional appropriations associated with wartime operations.

b. Procured in the FY2008 supplemental appropriations act (H.R. 2642/P.L. 110-252 of June 30, 2008).

c. Procured in the FY2009 supplemental appropriations act (H.R. 2346/P.L. 111-32 of June 24, 2009).

Contractors, Employment, and Production Line Shutdown

The prime contractor for the C-17 is Boeing Airlift and Tankers of Long Beach, CA. C-17s are the only aircraft made at Boeing's Long Beach production plant.[5] A May 2009 press report states that the C-17 program, including supplier firms, employs a total of about 30,000 people in 43 states.[6]

As of July 2009, 190 C-17s had been delivered to the Air Force. The 213th C-17 is scheduled to be delivered to the Air Force in March 2011.[7] As the final C-17 moves down the production line, the parts of the production line behind that aircraft will begin to shut down. Thus, if C-17 procurement ends at 213 aircraft, parts of the C-17 production line will begin to shut down prior to March 2011. Suppliers who provide materials or make long leadtime items for the C-17 would be among the first parts of the line to shut down.

International Sales

The C-17 is available to countries other than the United States. The United Kingdom (6 aircraft), Canada (4), Australia (6), Qatar (2), and a 10-nation NATO consortium (3 aircraft) have acquired C-17s to date,[8] and the UK is reportedly interested in a seventh.[9] As of November 17, 2009, India was reportedly in negotiations to buy 10 C-17s.[10]

FY2011 Procurement Funding Request

Consistent with the Administration's proposal to end C-17 procurement, the proposed FY2011 defense budget did not request funding for the procurement of additional C-17s, and instead requested $153.3 million to shut down the C-17 production line. The budget also requested $14.3 million in procurement funding for the C-17 program, but the requested funding is for C-17 funds the acquisition of required C-17 support equipment, spares, data, material improvement projects, training equipment, obsolescence, and mission support.

C-5 Modernization Program

The Air Force currently operates 111 C-5s, including C-5As procured between 1969 and 1974, and C-5Bs and Cs procured in the 1980s.[11] Decisions on how many C-17s to procure can be affected by decisions on how many C-5s are retained in the strategic airlift fleet, and by decisions on efforts to modernize C-5s.

---

[5] Amy Butler, "New C-17s Not Needed, DOD Analysis Shows," *Aerospace Daily & Defense Report*, May 18, 2009: 3.

[6] John M. Doyle, "Senators Push Panel For 15 More C-17 Cargo Aircraft," *Aerospace Daily & Defense Report*, May 13, 2009: 3.

[7] Government Accountability Office, *Defense Acquisitions[:] Strategic Airlift Gap Has Been Addressed, but Tactical Airlift Plans Are Evolving as Key Issues Have Not Been Resolved*, GAO-10-67, November 2009, p. 4.

[8] Totals from Boeing press releases as of November 27, 2009.

[9] Andrew Chuter, "Britain In Talks With Boeing For Another C-17," DefenseNews.com, November 27, 2009.

[10] "India eyeing 10 C-17s", UPI wire report of November 17, 2009, obtained from UPI.com.

[11] A total of 126 C-5s were produced. Fourteen C-5As have been retired, and one C-5B has crashed.

The Air Force is implementing a two-phase program for modernizing its fleet of 111 C-5s. The modernization effort is intended to improve C-5 operational capability, flight safety, reliability, and maintainability. The prime contractor for both phases of the modernization effort is Lockheed Martin of Marietta, GA.

C-5 Avionics Modernization Program (AMP)

The first phase of the modernization effort, the C-5 Avionics Modernization Program (AMP), began in 1999. The first flight of an AMP-modified C-5 occurred in December 2002. Operational test and evaluation of AMP began in September 2005 and was completed in July 2006. AMP-modified C-5s achieved initial operational capability (IOC) in February 2007.[12] As of July 2009, 55 C-5s had received the AMP modifications.[13] The Administration's FY2011 budget submission changed the quantity of C-5s to receive the AMP modifications from 110 to 88.[14] Modernization of the 88 is scheduled for completion in 2012.

C-5 Reliability and Re-engining Program (RERP)

The second phase of the C-5 modernization effort, the C-5 Reliability Enhancement and Re-engining Program (RERP), began in 2000. The RERP phase includes the installation of new engines and the modification of more than 70 electrical, fuel, and other subsystems. C-5s that receive RERP modification do so after receiving AMP modification, and are redesignated C-5Ms. Three C-5s received RERP during the RERP program's system development and demonstration (SDD) phase; the first production aircraft to receive RERP was scheduled to enter modification in August 2009.[15]

The RERP phase was originally intended for all 111 C-5s, like the AMP phase, but cost growth in 2007 that was sufficient to trigger a Nunn-McCurdy breach led to a DOD restructuring of the RERP phase in 2008 that limited RERP modifications to 52 C-5s.[16] The first flight of a RERP-modified C-5 occurred in June 2006. Test and evaluation of RERP-modified C-5s began in June 2006 and, as of June 2008, was scheduled to be completed in April 2010. Initial operational capability of RERP-modified C-5s is scheduled for June 2013.[17]

The Air Force testified in May 2009 that:

---

[12] Department of Defense, *Selected Acquisition Report (SAR), C-5 AMP*, December 31, 2009, p. 6.

[13] Government Accountability Office, *Defense Acquisitions[:] Strategic Airlift Gap Has Been Addressed, but Tactical Airlift Plans Are Evolving as Key Issues Have Not Been Resolved*, GAO-10-67, November 2009, p. 30.

[14] Department of Defense, *Selected Acquisition Report (SAR), C-5 AMP*, December 31, 2009, p. 6.

[15] Government Accountability Office, *Defense Acquisitions[:] Strategic Airlift Gap Has Been Addressed, but Tactical Airlift Plans Are Evolving as Key Issues Have Not Been Resolved*, GAO-10-67, November 2009, p. 30.

[16] DOD states:

> After notifying Congress of a Nunn-McCurdy breach on September 27, 2007, the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD (AT&L)) certified a restructured C-5 Reliability Enhancement and Reengining Program (RERP) on February 14, 2008. On March 14, 2008, the USD (AT&L) conducted a successful MS [Milestone] C Defense Acquisition Board (DAB) [review]. The USD (AT&L) signed the Acquisition Program Baseline (APB) reflecting the Nunn-McCurdy certification and the MS C approval on June 24, 2008.
>
> (Department of Defense, Selected Acquisition Report (SAR), C-5 RERP, June 30, 2008, p. 4.)

[17] Department of Defense, Selected Acquisition Report (SAR), C-5 RERP, June 30, 2008, p. 6.

> All C-5B/Cs have entered or completed AMP modification and the first C-5A completed modification on 16 Feb 2009…. Currently, the C-5 AMP effort continues at two modification centers at Dover AFB, Delaware and Travis AFB, California and will modify all 111 C-5 aircraft by 2015.
>
> The Reliability Enhancement and Re-engining Program (RERP) builds upon the C-5 AMP modification. C-5 RERP replaces the propulsion system and improves the reliability of over 70 systems and components….
>
> The production program is delivering on cost and on schedule. These efforts will fully modernize 52 C-5s that meet the warfighters' requirements.[18]

The Government Accountability Office (GAO) reported in November 2008 that:

> The Air Force has cut the number of C-5s it plans to fully modernize by more than half because of substantial cost increases in the modernization effort.... All 111 C-5s will receive the avionics upgrade, while only 52 will receive the reliability enhancement and reengining upgrade. This mix may change again, based on the results of DOD's new mobility capabilities studies, possible C-5 retirements, and a revised cost estimate for C-5 modernization....
>
> The costs to modernize C-5 aircraft have not been fully identified and are likely to increase. While the Air Force now estimates it will spend $9.1 billion to modernize C-5s, the costs may be underestimated because DOD did not apply risk or uncertainty analysis to its reliability enhancement and reengining program major cost drivers. Moreover, that particular effort is underfunded by almost $300 million and costs may escalate if the Air Force has to stretch the program schedule to stay within funding targets. At the same time, the Air Force has not fully priced or budgeted for a new C-5 upgrade program it plans to begin in fiscal year 2010 to address current avionics deficiencies and to add new capabilities. Some future costs, however, may be avoided should the Air Force justify retirement of some older C-5s and forego planned modifications.[19]

---

[18] 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, pp. 18-19.

[19] Government Accountability Office, *Defense Acquisitions[:] Timely and Accurate Estimates of Costs and Requirements Are Needed to Define Optimal Future Strategic Airlift Mix*, GAO-09-50, November 2008, p. 3. The report also stated on page 6 that:

> Together, [the AMP and RERP] upgrades were expected to improve the fleet's mission capable rate to at least 75 percent, thereby increasing payload capability and transportation throughput, and to reduce total ownership costs over the life cycle by about $14 billion in 2008 dollars.
>
> DOD initially expected to spend about $12 billion on the C-5 AMP and RERP efforts. However, both modernization efforts experienced cost problems. AMP development costs increased by approximately 20 percent and would have been higher had the Air Force not reduced requirements and deferred some development activities to other programs. Officials waived 14 operational requirements and deferred the correction of 250 deficiencies identified during testing, many of which will be addressed and funded in RERP or future efforts. In 2007, DOD reported that RERP average procurement unit costs grew more than 50 percent from the original baseline estimate.

The report also stated on pages 8-9 that:

> C-5 modernization cost increases caused DOD to change its approach for meeting its strategic airlift requirements. DOD had planned to meet the requirements with 112 fully modernized C-5s—

(continued...)

Requirements for Strategic Airlift

DOD's requirements for airlift capability have evolved over the years. The discussion below summarizes developments in the situation since 2005.

Mobility Capabilities Study 2005 (MCS-05)

DOD's Mobility Requirements Study of 2005 (MCS-05) identified a requirement for between 292 and 383 strategic airlift aircraft. The bottom end of this range coincided with the Air Force's program of record at the time, which included a force of 292 aircraft—180 C-17s and 112 fully modernized C-5s.[20] MCS-05 recommended a strategic airlift force structure of 292 aircraft, which the study said would meet national military strategy requirements with "acceptable risk."[21] The 2006 Quadrennial Defense Review (QDR) subsequently stated a DOD goal of maintaining 292 strategic airlifters, including 180 C-17s and 112 fully modernized C-5s.[22]

The unclassified executive summary of MCS-05 noted that unlike past mobility studies, MCS-05 did not recommend an airlift requirement expressed in millions of ton-miles per day (MTM/D) of airlift capacity.[23]

(...continued)

> i.e., those receiving both the AMP and RERP modifications—and 180 C-17 aircraft. The cost for the C-5 modernization efforts was estimated to be approximately $12 billion—about $900 million for the AMP program and $11.1 billion for the RERP program.
>
> However, just prior to the RERP production decision in February 2007, the prime contractor, Lockheed Martin, indicated that RERP costs related to labor and supplier parts had significantly increased, prompting new cost estimates. The Air Force's estimate of $17.5 billion was $4.2 billion more than Lockheed Martin's estimate of $13.3 billion at that time. The new estimate increased projected average procurement unit costs by more than 50 percent compared to the original baseline and triggered a statutory requirement for review and certification of the program.
>
> Following notification to Congress of the cost increase, the Under Secretary of Defense for Acquisition, Technology and Logistics requested that the CAIG estimate the cost of various options for DOD to meet its strategic airlift mission. The CAIG analyzed 14 options covering a range of scenarios for the RERP program in three broad categories: modifying all C-5 aircraft, partially modifying the C-5 fleet, and canceling the C-5 RERP program. Each option also assumed that the department would have at least 203 C-17 aircraft, 14 more than the program planned to acquire at that time. The CAIG estimated the cost of providing the RERP modification to all 111 aircraft to be $15.4 billion, halfway between the contractor's and the Air Force's estimates. Based on this analysis, the Under Secretary of Defense for Acquisition, Technology and Logistics concluded that the cost to RERP all C-5 aircraft was unaffordable and opted to limit full modification to 52 aircraft—47 C-5 Bs, both C-5 Cs, and 3 system development and demonstration aircraft. While the Air Force is expected to spend $3.4 billion less under the restructured program, ultimately less than one-half of the 111 aircraft will be modernized and at a much higher unit cost than originally estimated.

[20] One C-5 was destroyed in a crash on April 3, 2006, leaving 111 in the inventory.

[21] "Headquarters Air Mobility Command White Paper, KC-X: The Next Mobility Platform, The Need For A Flexible Tanker," p. 4.

[22] Government Accountability Office, *Defense Acquisitions[:] Timely and Accurate Estimates of Costs and Requirements Are Needed to Define Optimal Future Strategic Airlift Mix*, GAO-09-50, November 2008, p. 1.

[23] A ton-mile is one ton of cargo transported one mile. Transporting 50 tons (112,000 pounds) of cargo over a distance of 2,000 miles equates to 100,000 ton miles.

A previous DOD study of strategic airlift requirements, called the Mobility Requirements Study 2005 (MRS-05), was completed in 2000. The study established a requirement of 54.5 MTM/D.[24] Some observers expected that MCS-05 would identify a new requirement closer to 60 MTM/D, while others speculated that MCS-05 would not increase the 54.5 MTM/D requirement because of DOD concerns about being able to afford a larger airlift fleet.[25]

In September 2005, the Government Accountability Office (GAO) criticized the methodology that was being used for MCS-05.[26] A more detailed GAO criticism followed in September 2006, as MCS-05 was nearing completion.[27] Other observers criticized MCS-05 for not adequately addressing DOD intra-theater airlift needs, and for focusing on near-term capabilities rather than taking a longer view.[28] The criticism regarding intra-theater airlift needs was particularly germane because the C-17 can be used in for intra-theater airlift operations.

In September 2006, it was reported that the Air Force's Air Mobility Command was again studying DOD airlift needs. Some observers might have interpreted the Air Force's initiation of another airlift study so soon after the completion of MCS-05 as tacit acknowledgment of flaws in the MCS and an attempt to ameliorate them.[29]

Congressionally Mandated Study of 2007

To provide Congress with greater clarity into airlift requirements, Section 1034 of the FY2007 Defense Authorization Act (H.R. 5122/P.L. 109-364 October 17, 2006) required DOD to submit a report to Congress defining airlift requirements in terms of million-ton-miles per day. DOD delivered the report in classified form to the congressional defense committees on February 27, 2007.

Evolution in Planned Mix of Airlift Aircraft, 2005-2009

As shown in **Table 3**, which is taken from a November 2009 GAO report, the planned mix of C-17s and C-5s evolved between December 2005 and June 2009 due to various events, including continued procurement of C-17s, the restructuring of the C-5 modernization program to limit the RERP phase to 52 aircraft, and the crash in 2006 of one C-5 (which reduced the C-5 inventory from 112 to 111).

[24] Marc Selinger, "DoD Launching New Review of Transportation Needs," *Aerospace Daily*, March 11, 2004.

[25] John Tirpak, "Air Mobility in the Doldrums," *Air Force Magazine*, vol. 88, issue 8, August 2005, available online at http://www.afa.org/magazine/aug2005/0805mobility.html.

[26] Government Accountability Office, *Defense Transportation: Opportunities Exist to Enhance the Credibility of the Current and Future Mobility Capabilities Studies*, GAO-05-659R, September, 2005.

[27] Government Accountability Office, *Defense Transportation: Study Limitations Raise Questions About the Adequacy and Completeness of the Mobility Capabilities Study and Report*, GAO-06-938, September 2006.

[28] John T. Bennett, "Influential DoD Mobility Study's Focus on Intratheater Needs Questioned," *Inside the Air Force*, April 7, 2006.

[29] Michael Fabey, "AF Formulating Mobility Plan," *Aerospace Daily*, September 28, 2006.

Table 3. Planned Mix of Strategic Airlift Aircraft, 2005-2009

Aircraft type	December 2005	September 2006	February 2008	June 2008	June 2009
Event	Mobility Capability Study released	Congressional appropriation for additional C-17s	C-5 RERP program restructured	Congressional appropriation for additional C-17s	Congressional appropriation for additional C-17s
C-17s	180	190	190	205	213
C-5s (fully modernized—both AMP and RERP)	112	112	52	52	52
C-5s (AMP modernization only)	0	0	59	59	59
Estimated MTM/D	33.09	33.95	32.17	34.79	34.79

Source: Information taken from Table 5 (page 12) of Government Accountability Office, *Defense Acquisitions[:] Strategic Airlift Gap Has Been Addressed, but Tactical Airlift Plans Are Evolving as Key Issues Have Not Been Resolved*, GAO-10-67, November 2009. GAO states that Table 5 is based on GAO analysis of DOD budget and program data.

Notes: Fully modernized C-5s are those that have received both AMP and RERP.

Congressionally Mandated IDA Study of 2009

Section 1046 of the FY2008 defense authorization act (H.R. 4986/P.L. 110-181 of January 28, 2008) required the Secretary of Defense "to conduct a requirements-based study on alternatives for the proper size and mix of fixed-wing intratheater and intertheater airlift assets to meet the National Military Strategy for each of the following timeframes: fiscal year 2012, 2018, and 2024." The study was conducted by the Institute for Defense Analyses (IDA) and completed in February 2009. The study summarized its findings as follows:

> *What are the airlift requirements?*
>
> The requirements for single or two concurrent MCO demands were based on those used in the Mobility Capabilities Study (MCS) from 2005. For the non-MCO demands, however, this study was able to take advantage of early versions of the more current Steady State Security Posture scenarios in order to derive demands outside the major theaters of war. Together, these constituted the requirements assumed for airlift.
>
> *Does the currently programmed fleet meet the requirements?*
>
> We found that the POR fleet is adequate in meeting the benchmark requirements identified in the MCS for moderate acceptable risk. Three different computer models used in this study produced somewhat different results for deliveries. The most pessimistic results matched MCS benchmark results, and with the other models, lower force levels than programmed also met the MCS benchmark level.
>
> *What programmatic alternatives might also be considered and how well do they meet these requirements? What are the life-cycle costs of these alternatives?*
>
> The study considered 36 alternative mixes and sizes and compared them both in cost and effectiveness with the POR. Figure ES-1 illustrates the relative capabilities of several alternative fleets that differ only in numbers or types of strategic lift aircraft (i.e., numbers

and types of C-5s and C-17s). Results are shown relative to the capabilities that met the MCS moderate risk delivery demands for cargo. Similar analyses were performed for alternative fleets that differ in the numbers and types of intratheater airlift aircraft.

The study identified several relatively inexpensive ways of generating higher capability from existing forces, without procuring additional strategic airlifters beyond those already programmed. These include the following: use C-5s at Emergency Wartime Planning levels (adds 2-4 percent, depending on whether the extra weight carried is fuel or cargo); transport with CRAF[30] whatever oversize cargo that CRAF can carry, in addition to bulk cargo on pallets, in order to free up organic airlifters for the larger and heavier cargo (adds 10 percent); use host nation airlifters to the maximum extent possible (4 or 5 percent); and make use of tankers not involved in tanking missions to carry cargo in theater (adds about 4 percent). Use of these capabilities could also allow for a smaller strategic fleet that still meets MCS benchmark delivery requirements. Thus, our analyses using the MCR moderate risk benchmark suggest that an upper bound on the number of required strategic airlifters is 316, indicated by the two yellow boxes in Figure ES-1.

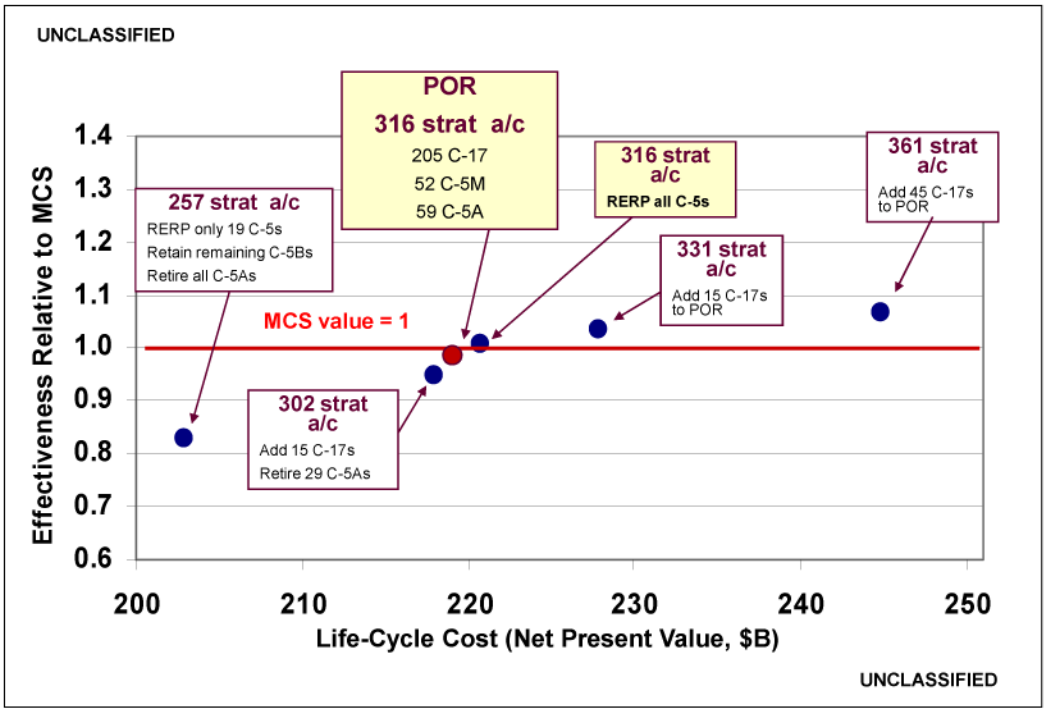

Figure ES-1. Comparison of Cost-Effectiveness for Several Airlift Force Alternatives in Two Concurrent MCOs

[30] This is a reference to the Civil Reserve Air Fleet, a group of commercial aircraft that U.S. airlines are committed by contract to make available to DOD to augment DOD's military airlift capability in emergencies.

A small amount of additional capability could be achieved if all C-5s are converted through Reliability Enhancement and Re-engining Program (RERP) to C-5Ms. This alternative is at comparable life-cycle cost to that of the POR; near-term acquisition costs are almost repaid over time in later years by reduced operating and support (O&S) costs.

Traditionally, airlift and other force requirements are set by wartime demands (i.e., MCOs), not steady-state peacetime demands. Airlift is heavily used in both. If the appropriate acquisition planning scenarios are not MCOs but are high tempo non-MCO operations such as in Iraq and Afghanistan today, we find that some C-5As could be retired to save O&S costs with no loss in capability for those missions. This is illustrated in Figure ES-2. Moreover, a more cost-effective fleet than the POR is one that, in addition to having fewer C-5As, uses the smaller C-27Js instead of the larger C-130Js. These observations are driven by the need for numerous, geographically separated, but small loads during non-MCO operations, as currently anticipated in DoD planning scenarios.

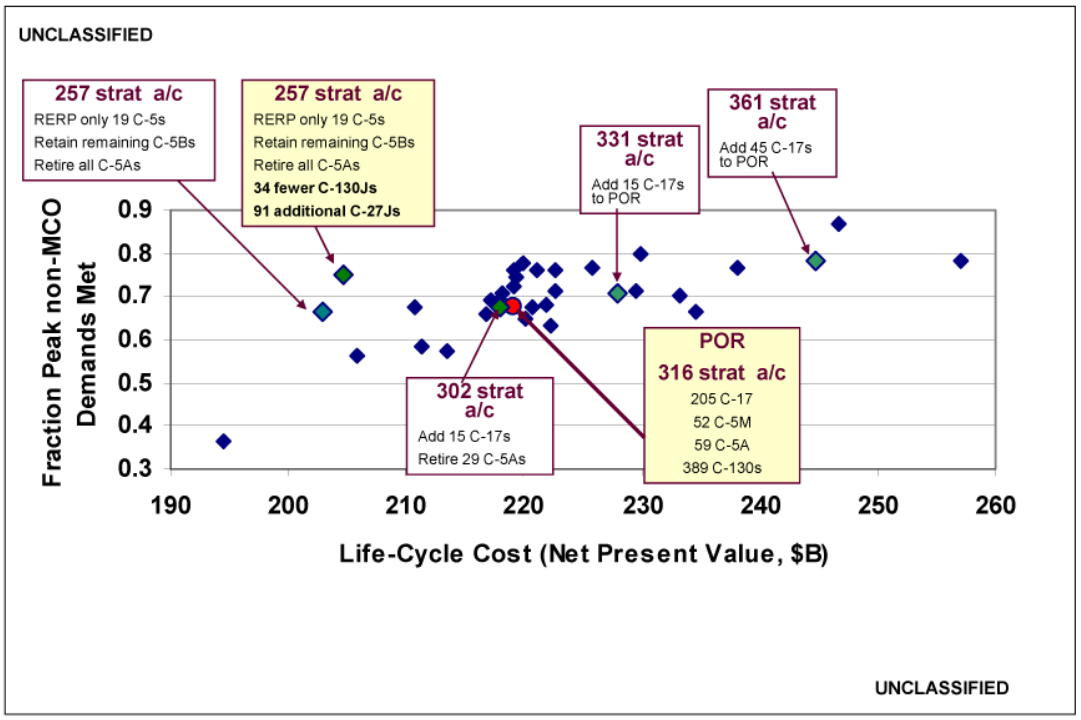

Figure ES-2. Comparison of Cost-Effectiveness for Several Airlift Force Alternatives in Airlift-Stressing non-MCO Operations

Our assessment of the C-17 line shutdown and restart is that continued production, even at low rates, is expensive relative to restart costs. Moreover, under the scenarios and other assumptions considered in this study, additional C-17s were not needed to meet the MCS moderate-acceptable-risk delivery rates used as a benchmark by the analyses conducted here. We also found that retiring C-5As to release funds to buy and operate more C-17s is not cost-effective.

How do the alternatives differ in service life?

> We projected aircraft service lifetimes based on planned flying hour and flying severity conditions. Excursions to the planned operating conditions were also examined. Our findings are that all airlifters except the C-130E have structural lifetimes that are beyond 2030. Virtually all the C-5s and C-17s have lifetimes beyond 2040. The C-130E is near its structural life limit and extensions to that life are not cost-effective by our analyses.
>
> *How well do CRAF aircraft contribute to wartime deliveries? At what specific organic fleet inventory would it impede the ability of CRAF participants to remain a viable augmentation option?*
>
> We included CRAF in the simulated airlift deliveries and find them to be useful for passenger and cargo delivery, especially in MCOs if CRAF aircraft are allowed to carry some oversize cargo. Nonetheless, fewer than half of the CRAF aircraft available for Stage III (during two MCOs) are actually used, so current incentives provide more than enough CRAF for wartime demands. We also note that restructuring airline fleets should not significantly influence CRAF availability but may reduce numbers of charter passenger aircraft. A larger organic military fleet of airlift aircraft does not challenge passenger CRAF viability but could influence cargo CRAF because the organic fleet would be expected to shoulder a larger amount of the cargo movement required in peacetime. However, the cargo CRAF participates in a strong economic sector, does not strongly depend on CRAF in contrast to other commercial revenues, and is not likely to be significantly hurt by likely changes in DoD force levels.[31]

Mobility Capabilities and Requirements Study 2016 (MCRS-16)

The Office of the Secretary of Defense (OSD) and the U.S. Transportation Command are currently examining future requirements for airlift capability in a study called Mobility Capability and Requirements Study 2016 (MCRS-16), which is expected to be completed by the end of 2009.[32] The U.S. Transportation Command testified in February 2009 that MCRS-16 and the congressionally mandated IDA study discussed in the previous paragraph "will aid decision makers in determining the mobility requirements necessary to defend the homeland, prevail in the war on terror, conduct irregular warfare and win conventional campaigns in the 2016 timeframe."[33]

GAO reported in November 2008 that

> According to Air Force officials, [MCRS-16] will take into account a variety of changes that have occurred since the last mobility study was completed in 2005, including the following:

[31] W. L. Greer, G. M. Koretsky, and J. P. Woolsey, *Study on Size and Mix of Airlift Force, Unclassified Synopsis*, Institute for Defense Analyses, IDA Paper P-4428, February 2009, pp. ES-1 to ES-4. A copy of this document was provided to CRS by Lockheed on October 2, 2009.

[32] 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. 19.

[33] [33] 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.

> • Addition of over 92,000 Marines and Army soldiers and their equipment that will need to be transported to locations across the United States and around the world.
>
> • Establishment of a new African Command that will require the movement of troops and equipment to a variety of locations around the second largest continent in the world.
>
> • Introduction of Mine Resistant Ambush Protected vehicles, which are being used in Iraq to provide enhanced protection for U.S. troops.
>
> • Increase in weight of the Army's Future Combat System vehicles, which makes it no longer possible to transport some vehicles with C-130 aircraft (DOD's primary tactical airlifter).

The GAO report also stated:

> Some expect the [congressionally mandated IDA study and MCRS-16] will identify increased demands on airlift, particularly for the C-17 since it can perform both a strategic and tactical role. As Army equipment becomes heavier and/or bulkier, the C-17 may be the only aircraft capable of delivering major weapon systems to the front lines and to more austere bases in the theater of combat. The results of both studies, if done accurately and comprehensively, should provide the analytical foundation for the future airlift force structure.[34]

A May 2009 press report stated:

> Early indications from the Pentagon's Mobility Capabilities Requirements Study suggest no need for additional strategic airlift beyond the funded procurements of re-engined C-5s and 205 C-17s already planned, says U.S. Air Force Chief of Staff Gen. Norton Schwartz.
>
> The 2005 Mobility Capabilities Study had suggested a requirement of roughly 300 strategic airlifters, and Schwartz says he sees "no major shift in the demand signal." The 2005 study, however, was discredited in much of Washington as a budget-driven formality under former Defense Secretary Donald Rumsfeld, and a new study has been eagerly awaited….
>
> Even if more strategic airlift is ultimately needed, Air Force Secretary Michael Donley says an independent study[35] presents several options before considering a buy of additional C-17s, the only aircraft made at Boeing's Long Beach, Calif., plant.
>
> These include leasing additional Civil Reserve Air Fleet capacity, as well as re-engining all 111 C-5s.[36]

Prior-Year Legislation Relating to Airlift Force Structure

Section 132 of FY2004 Defense Authorization Act

Section 132 of the FY2004 defense authorization act (H.R. 1588/P.L. 108-136 of November 24, 2003) prohibited the Secretary of the Air Force from proceeding with a decision to retire C-5As

[34] Government Accountability Office, *Defense Acquisitions[:] Timely and Accurate Estimates of Costs and Requirements Are Needed to Define Optimal Future Strategic Airlift Mix*, GAO-09-50, November 2008, p. 10.

[35] This may be a reference to the congressionally mandated IDA study.

[36] Amy Butler, "New C-17s Not Needed, DOD Analysis Shows," *Aerospace Daily & Defense Report*, May 18, 2009: 3.

from the active inventory of the Air Force in any number that would reduce the total number of C-5As in the active inventory below 112 (effectively now 111, following the crash in 2006 of a C-5 in 2006) until the Air Force modified a C-5A aircraft to RERP configuration and DOD's Director of Operational Test and Evaluation conducted an operational evaluation of that aircraft and provided to the Secretary of Defense and the congressional defense committees an operational assessment. This provision was repealed by Section 311 of the FY2009 supplemental appropriations act (see below).

Section 132 of FY2006 Defense Authorization Act

Section 132 of the FY2007 defense authorization act (H.R. 5122/P.L. 109-364 of October 17, 2006) amended 10 USC 8062 to create a new subsection (g)(1) stating that, effective October 1, 2008, the Secretary of the Air Force shall maintain a total aircraft inventory of strategic airlift aircraft of not less than 299 aircraft. The provision defines strategic airlift aircraft as those with a cargo capacity of at least 150,000 pounds and a capability to transport outsized cargo over an unrefueled range of at least 2,400 nautical miles. The aircraft types that meet this definition are the C-5 and C-17.

Section 311 of FY2009 Supplemental Appropriations Act

Section 311 of the FY2009 supplemental appropriations act (H.R. 2346/P.L. 111-32 of June 24, 2009) repealed Section 132 of the FY2004 defense authorization act (see above) and permits the Secretary of the Air Force to retire C-5As 15 days after certifying to the congressional defense committees that retiring the aircraft will not significantly increase operational risk of not meeting the national defense strategy, and provided that such retirements may not reduce total strategic airlift force structure inventory below the 292 strategic airlift aircraft level identified in the Mobility Capability Study 2005 (MCS-05) unless otherwise addressed in the FY2010 defense authorization act.

Issues for Congress

Procuring C-17s and Legislating on Airlift Force Structure

The primary issue for Congress in FY2011 is whether to procure additional C-17s. An additional issue is whether to pass additional legislation relating to the airlift aircraft force structure.

The Administration argues that enough C-17s have now been procured to meet future operational needs. Supporters of procuring additional C-17s in FY2011 believe additional will be needed to meet future operational needs.

In considering whether to procure additional C-17s in FY2011, Congress may consider a number of factors, including the total requirement for airlift capability and the cost-effectiveness of C-5 modernization compared to procuring additional C-17s. Additional factors to consider are constraints on total defense spending, the potential affect that procuring additional C-17s may have on reducing funding for other defense programs, and the possibility that funding additional C-17s will lead to the veto of the FY2011 defense authorization and/or appropriations bills.

Requirements for Airlift Capability

Awaiting Results of IDA Study and MCRS-16

Observers are now awaiting the results of the two current studies on the total requirement for airlift capability—the congressionally mandated IDA study and MCRS-16.

September 2009 Letter from Secretary of Defense

A September 29, 2009 letter from Secretary of Defense Robert Gates to the chairmen of the House and Senate Armed Services Committee states:

> I am writing as a follow up to our discussion last week regarding the retirement of strategic airlift aircraft.
>
> The Department [of Defense] fully supports the language in Section 311 of the Supplemental Appropriations Act of 2009 (P.L. 111-32) which requires a minimum of 292 strategic airlift aircraft as reflected in the Department's 2005 Mobility Capability Study.
>
> Since the release of MCS-05, Congress has funded an additional 33 C-17s the Department did not request. The addition of these C-17 aircraft influenced our decision to upgrade only 52 of 111 C-5s with the Reliability Enhancement and Re-engining Program (RERP). Congress is now considering adding another 10 C-17s in the FY2010 budget.
>
> The Department's current fleet of 324 aircraft (213 C-17/111 C-5) is in excess of strategic airlift needs, driving increased operating costs at the expense of other priorities. Each C-5A costs over $13 million in annual operating expenses. Since we are over our current requirement by eight aircraft, as determined by the analysis conducted during the C-5 RERP Nunn-McCurdy recertification, it costs the Department over $100 million a year in excess expenditures. These costs will only grow if we receive additional C-17s and/or delay the ability for the Department to retire excess aircraft.
>
> Initial indications from Mobility Capability Requirements Study 2016 show the strategic balance will not fundamentally change. This leads me to believe: 1) the Department does not need additional C-17s to meet strategic needs; 2) the Department needs to begin shedding excess strategic airlift inventory by retiring a portion of the C-5A fleet now. The Department requests your support and authority to allow the proper management of the strategic airlift fleet to meet the Nation's requirements.
>
> Thank you for your strong interest and continued support of the Department.[37]

November 2009 GAO Report

GAO reported in November 2009 that:

> Additional funds provided by Congress for C-17 procurement more than offset the strategic airlift gaps associated with reduced C-5 modernization plans. However, there is a potential

[37] Letters dated September 29, 2009, from Secretary of Defense Robert Gates to the Honorable Carl Levin and (separately) the Honorable Ike Skelton, posted on *InsideDefense.com* (subscription required).

future gap in tactical airlift capabilities for transporting medium weight Army equipment that cannot fit on C-130 aircraft. The C-17 fleet, in its dual role of providing both strategic and tactical airlift, currently provides this capability and is anticipated to continue to do so for many years. The JFTL [Joint Future Theater Lift aircraft] is envisioned to eventually replace the C-130H and perform this and other roles, but will not be available for 15 years or more under the current acquisition strategy. While the various mobility studies acknowledge the C-17s' significant dual role, they did not comprehensively evaluate an expanded future use of the C-17 for the transport of medium weight equipment and how this could affect the force structure, the C-17s' service life, and when to shut down the C-17 production line. For example, the studies do not quantify current and anticipated future use of the C-17 for tactical airlift. This is because DOD officials do not consider the C-17 to be a suitable substitute for the JFTL....

A potential future capability gap exists in the deployment and redeployment of Army medium weight weapon systems within a theater of combat. The C-17 is the only aircraft currently capable of transporting heavier equipment, such as combat configured armored Strykers and Mine Resistant Ambush Protected vehicles, within a theater of operations as these are too large and bulky for C-130s to carry. However, the C-17 cannot transport this equipment into austere, short, or unimproved landing areas. DOD's long-term plan is to use the JFTL, the planned C-130H replacement, to transport these vehicles in theater, including to such access-challenged locations. However, it will not be available for at least 15 years as currently planned. While the various mobility studies acknowledge the C-17 can perform both strategic and tactical airlift missions, none of the three recently completed or ongoing studies comprehensively considered the C-17 in the tactical force structure, even though about 20 percent of the tactical sorties flown by the C-17 fleet in fiscal year 2007 were for missions where loads were too large for C-130s. As such, DOD has not evaluated the impact the increasing tactical heavy lift mission will have on future tactical airlift requirements, the C-17's service life, its availability to perform strategic airlift and other tactical airlift missions, and the impact it could have on C-17 production shutdown plans.

DOD officials do not believe that the C-17 is a suitable substitute for the JFTL mission. A DOD official stated that preliminary results of the Mobility Capabilities and Requirements Study 2016 show that in the worst case planning scenario there would be enough C-17s to perform its primary role as a strategic airlifter, as well as some tactical missions through 2016. This is because the study analysis shows the peak demand for the C-17 and the C-130 occurs at different times and the C-17 is aging as planned. However, officials indicated that none of the current mobility studies analyzed the need for the C-17 to perform additional tactical heavy lift missions for the 8-year period between 2016 and 2024, when the JFTL is expected to be fielded. Furthermore, because we were not granted access to the preliminary study information, we could not ascertain the extent to which the C-17's heavy lift mission had been considered in DOD's analysis through 2016. C-17 production is scheduled to end in March 2011. As we previously reported a well-reasoned, near-term decision on the final C-17 fleet size could help DOD avoid substantial future costs from ending production prematurely and later restarting production. For example, the Air Force has estimated that restoring the production line could cost $2 billion. Costs and challenges associated with such a course include hiring and training a workforce of nearly 3,100 people, reinstalling and restoring production tooling, and identifying suppliers and qualifying their parts and processes.[38]

[38] Government Accountability Office, *Defense Acquisitions[:]Strategic Airlift Gap Has Been Addressed, but Tactical Airlift Plans Are Evolving as Key Issues Have Not Been Resolved*, GAO-10-67, November 2009, pp. 11 and 13-14.

November 2008 GAO Report

GAO reported in November 2008 that:

> We previously reported on shortcomings in the Institute for Defense Analysis' study plan that could make it difficult for decision makers to know how much strategic airlift is needed. For example, the study plan did not provide details on assumptions and the measures of effectiveness, or metrics, the command officials would be using in their evaluation. Measures of effectiveness are considered to be especially important when evaluating alternatives, such as comparing the results of two analyses that measure different airlift force mixes. We recommended in April 2008 that DOD take action to ensure that the final study plan included sufficient details to address all the elements specified in the law and needed to inform decision makers on airlift issues.[39] DOD concurred with our recommendation.
>
> We also identified shortcomings in DOD's 2005 mobility capabilities study approach that, if not addressed, could be repeated again in the current study. Unlike prior studies, the 2005 study did not recommend a specific airlift requirement expressed in million ton-miles per day—a common metric integral to prior capability studies that defines and quantifies airlift requirements as a basis for computing the size and optimal mix of airlift forces. Instead, DOD officials stated that it expressed its airlift requirement in terms of specific numbers and types of aircraft needed to meet the national defense strategy to take into account real-world operating parameters that may cause aircraft payloads to vary significantly from standard planning factors. Later, in response to congressional direction, DOD translated the requirements into a million ton-mile requirement. We also found the study did not identify the operational impact of increased or decreased strategic airlift on achieving warfighting objectives that would be associated with different mixes of C-5 and C-17 aircraft. As a result, we could not determine how the study concluded that the mix of C-5s and C-17s at that time was adequate for meeting mobility requirements and for supporting strategic airlift portfolio investment decisions. In 2006, we recommended that DOD include mobility metrics, along with warfighting metrics to determine air superiority, when completing future mobility capabilities studies. DOD concurred with this recommendation.[40]
>
> Although DOD concurred with the recommendation, a Transportation Command official stated that a decision has not yet been made on what specific metrics will be used to determine the number and mix of strategic airlifters in the current mobility capabilities study. At the time of this writing, the study plan had not been finalized and it is unclear whether a million ton-miles metric will be used, though it is being considered. DOD often uses the million ton-mile metric as an easy way to compare the capacity of different fleet mixes. For example, according to a DOD official, since C-130s, C-130Js, C-17s, C-5As, C-5Bs, and C-5Ms all have different capabilities when it comes to payload and range, it is difficult to compare different mixes of them without using this metric.[41]

The report also stated:

---

[39] The passage at this point contains a footnote citing the following GAO report: Government Accountability Office, *Defense Transportation[:] DOD Should Ensure that the Final Size and Mix of Airlift Force Study Plan Includes Sufficient Detail to Meet the Terms of the Law and Inform Decision Makers*, GAO-08-704R, April 28, 2008.

[40] The passage at this point contains a footnote citing the following GAO report: Government Accountability Office, *Defense Transportation: Study Limitations Raise Questions about the Adequacy and Completeness of the Mobility Capability Study and Report*, GAO-06-938, September 2006.

[41] Government Accountability Office, *Defense Acquisitions[:] Timely and Accurate Estimates of Costs and Requirements Are Needed to Define Optimal Future Strategic Airlift Mix*, GAO-09-50, November 2008, pp. 10-11.

> The C-5 and C-17 provide complementary capabilities. However, DOD continues to struggle with identifying the specific quantities and determining the optimal mix of aircraft needed. Clarity is needed before committing additional billions of dollars to C-5 modernization programs, establishing C-5 retirement schedules, and/or acquiring additional C-17 aircraft. Careful planning is also important to avoid the costs of shutting down the C-17 line prematurely and later deciding to restart the production. The new mobility studies, if done correctly, could bring clarity to strategic airlift capabilities needed to support the future force and changed threats, as well as inform future tactical airlift requirements because of the C-17's dual role. Important metrics left out of the 2005 capabilities study—such as specific ton-mile mobility requirements and relative reliability rates—are considered critical factors in quantifying and analyzing cost-effective force mixes. DOD concurred with our prior recommendation to use mobility metrics to inform future mobility capabilities studies. However, at this writing, it is unclear whether DOD will use a million ton-mile metric in its current analysis to determine the cost-effective mix of aircraft and guide important investment decisions related to the expenditure of billions of dollars. Until comprehensive requirements—supported by appropriate, quantifiable metrics—and the full costs for alternate courses of action are identified, DOD decision making on the future size and mix of strategic airlift is hampered, thus increasing the risk of incurring unnecessary costs and establishing a less than optimal mix of strategic and tactical airlift forces.[42]

Cost-Effectiveness of C-5 Modernization Compared to C-17 Procurement

November 2008 GAO Report

GAO reported in November 2008 that:

> if the cost for C-5 modernization continues to increase, Air Force officials may have to reconsider the mix within its airlift portfolio or request additional funding. Additional investments in C-17 aircraft may become more attractive. Currently, a new C-17 would cost about $276 million compared to $132 million to fully modernize a C-5. Each new C-17 potentially adds 100 percent of its cargo capacity toward meeting the total airlift requirement. Because the C-5s are already part of the operational force, each aircraft's current capacity is already counted toward the total requirement. Consequently, according to DOD data, the C-5 modernization programs only provide a marginal increase of 14 percent in capability over nonmodernized aircraft. Using DOD's million ton-mile per day planning factors, we, working in collaboration with DOD, calculated that DOD would need to fully modernize 7 C-5s to attain the equivalent capability achieved from acquiring 1 additional C-17 and the costs would be over 3 times more (see table 3).

[42] Government Accountability Office, *Defense Acquisitions[:] Timely and Accurate Estimates of Costs and Requirements Are Needed to Define Optimal Future Strategic Airlift Mix*, GAO-09-50, November 2008, pp. 19-20.

Table 4. [Table 3 in GAO report] Comparison of a Modernized C-5 and C-17 Equivalent Aircraft Capabilities

	Unit cost[a]	Aircraft needed to provide equivalent capabilities	Total Cost of equivalent capability
C-5 fully modernized	$ 132 million	7	$924 million
C-17 new	$276 million	1	$276 million

Source: GAO analysis of DOD data.

a. Unit costs reflect procurement costs only. Data are rounded for presentation purposes.

The analysis does not include the life-cycle costs of adding more C-17s to DOD's airlift portfolio. However, previous DOD analysis indicated that the life-cycle costs would be approximately the same if DOD replaced 30 C-5s with 30 C-17s.

The Air Force has not fully identified the funding needed to modernize the C-5 aircraft, and costs are likely to increase. The current cost estimate is $9.1 billion to AMP the entire fleet of 111 aircraft and RERP 52 aircraft. However, we believe this is understated. The current budget does not fully fund the revised RERP program and the CAIG's [the DOD Cost Analysis Improvement Group's] cost estimate does not adequately address risk and uncertainty. Further, the cost estimate does not include the costs for a new modernization upgrade program slated to begin in fiscal year 2010 that would fix AMP deficiencies and add new capabilities. Alternatively, some future modification costs may be avoided should the Air Force justify retirement of some older C-5s.

The current budget does not sufficiently fund the revised RERP program. According to the CAIG's analysis, the C-5 RERP is underfunded by about $294 million across the Future Years Defense Plan for fiscal years 2009- 2013. Approximately $250 million less is needed in fiscal years 2009 through 2011, and $544 million more is needed in fiscal years 2012 and 2013. According to program officials, the Air Force is committed to fully funding the CAIG RERP cost estimate in the fiscal year 2010 President's budget yet to be submitted. However, program officials could not identify sources for the additional funding needed in fiscal years 2012 and 2013....

While our review of the CAIG's cost-estimating methodology found it generally well documented, comprehensive, and accurate, we found some weaknesses that impair the credibility and overall reliability of the C-5 cost estimate. Specifically, the CAIG did not take risk or uncertainty into account for some major cost drivers, in particular the propulsion system and labor. Because cost estimates predict future program costs, uncertainty is always associated with them. For example, there is always a chance that the actual cost will differ from the estimate because of a lack of knowledge about the future as well as errors resulting from historical data inconsistencies, assumptions, cost-estimating equations, and factors that are typically used to develop an estimate. Quantifying that risk and uncertainty is considered to be a cost estimating best practice because it captures the cumulative effect of risks and recognizes the potential for error.

In a memo documenting its independent cost estimate, the CAIG stated that the biggest risk to the cost estimate was the purchase agreement between Lockheed Martin and General Electric for the propulsion system that is conditioned on specific annual procurement quantities. The CAIG had estimated that the Air Force could save 18 percent by meeting the quantity and schedule identified in the revised RERP. However, CAIG officials stated that if the budget is not sufficient to meet these agreed-to quantities, then anticipated price breaks

> would not occur, resulting in increased costs of the C-5 RERP to the government. Despite this significant risk, the CAIG did not perform a risk/uncertainty analysis to determine the extent to which costs would increase should the buy quantity be cut. CAIG officials stated that they believe propulsion system procurement risk has been mitigated because they have identified the quantities necessary to meet the conditions of the purchase agreement and the Air Force plans to fully fund to this estimate. Despite these assurances, however, we have found that DOD often changes procurement quantities and there is a risk that quantities for the C-5 RERP program may change. For example, DOD's Selected Acquisition Report summary shows that of the 56 programs currently in production, 38 (or 68 percent), have experienced a quantity change since their production decisions.
>
> In addition, the CAIG did not quantify or address uncertainty with its $2.1 billion labor cost estimate associated with the installation of the RERP on C-5 production aircraft. The RERP program experienced a 29-month break in production between the last system development and demonstration unit and the first production unit. As such, the CAIG had to estimate inefficiencies due to loss of learning and how it would affect the costs of future production. The CAIG's assumptions differed from those used by the Air Force and Lockheed Martin, which caused the CAIG estimate to be about $200 million more than Lockheed Martin's estimate and about $400 million less than the Air Force's labor estimate. As a result of the weaknesses discussed above, the Air Force's basis for making strategic airlift portfolio investment decisions is impaired, and the RERP program is at increased risk of experiencing cost overruns.
>
> Additional modernization efforts not yet budgeted will add to future C-5 costs. Air Force officials stated that a new C-5 upgrade program is slated to begin in fiscal year 2010. The initial funding requirement is $65 million—$40 million in research, development, test, and evaluation funds and $25 million in procurement funds—to migrate all C-5s toward a standard software configuration, based on changes made in the AMP and RERP programs. Requirements previous waived on the AMP may also be addressed in the initial block of this program. Additional funding will be requested in 2012 and beyond to provide additional capabilities. According to a program official, the total requirements and funding needs for this modernization program have not been finalized. However, at this time it is not expected to be as costly as the C-5 AMP or RERP.
>
> The eventual costs for modernizing C-5 aircraft hinge upon the decisions DOD officials make about the number and mix of strategic airlifters DOD needs in the future. If additional C-5 capability is needed, more C-5 aircraft may need to receive the RERP modification and costs will increase. On the other hand, if decision makers believe additional C-17 capability is needed in lieu of the C-5, the Air Force may be able to reduce the number of aircraft that need the AMP modification and additional modifications slated to begin in fiscal year 2010.[43]

Lockheed Comment on November 2008 GAO Report

Lockheed, the maker of the C-5, found fault with the November 2008 GAO report, stating in a seven-page point paper that:

> The GAO report adequately addresses some elements surrounding past C-5 modernization debate and C-17 alternatives, yet falls fall short of presenting a balanced discussion that advances a better public understanding of the complex strategic airlift debate. The GAO

[43] Government Accountability Office, Defense Acquisitions[:] Timely and Accurate Estimates of Costs and Requirements Are Needed to Define Optimal Future Strategic Airlift Mix, GAO-09-50, November 2008, pp. 12-16.

report selectively applies facts that detract from the merits of C-5 modernization while omitting current and relevant analysis that highlights the value of the program. Lockheed Martin concurs with the DoD's characterization that the GAO report contains misleading information and illustrations....

The GAO report does not represent a balanced discussion, but instead presents a rather one-dimensional perspective which leans toward C-17 advocacy while failing to acknowledge virtually any of the benefits of C-5 modernization. In its 2008 RERP recertification, the DoD reviewed 14 different airlift options and concluded that no other alternative provided greater or equal military capability at less cost than C-5 modernization. RERP delivers significant operational capabilities, meets all requirements, and pays for itself.[44]

[44] Lockheed point paper entitled "White Paper On Government Accountability Office (GAO) Report *'Defense Acquisitions: Timely and Accurate Estimates of Costs and Requirements Are Needed to Define Optimal Future Strategic Airlift Mix' (November 2008*)," provided to CRS by Lockheed on October 2, 2009.

Appendix. Legislative Activity in 2010

FY2010 Defense Authorization Act (H.R. 2647/P.L. 111-84)

Conference

The conference report (H.Rept. 111-288 of October 7, 2009) on the FY2010 defense authorization act (H.R. 2647/P.L. 111-84 of October 28, 2009) authorizes no funding for the procurement of additional C-17s. (Page 948)

Section 137 of the act prohibits the Secretary of the Air Force from proceeding with a decision to retire C-5As in any number that would reduce the active inventory of C-5s below 111 until certain conditions are met, and requires the Secretary of the Air Force to submit a report to the congressional defense committees on the issue of C-5 retirement.

Section 138 requires the Secretary of the Air Force, in coordination with the Director of the Air National Guard, to submit to the congressional defense committees, at least 90 days before a C-5 airlift aircraft is retired, a report on the proposed force structure and basing of C-5 and C-17 aircraft.

Section 139 amends 10 USC 8062(g)(1) to state that the Secretary of the Air Force shall maintain a total inventory of not less than 316 C-5s and C-17s. If the current force of 111 C-5s were retained, this provision would support a C-17 force of not less than 205 C-7s—the number procured through FY2008.

Section 1052 requires a report on the force structure findings of the 2009 Quadrennial Defense Review (QDR). The House report on H.R. 2647 (H.Rept. 111-166 of June 18, 2009—see discussion above) stated that this report is to include, among other things, a discussion of description of the factors that informed decisions regarding strategic and tactical airlift force structure.

Section 137 states:

> SEC. 137. LIMITATION ON RETIREMENT OF C–5 AIRCRAFT.
>
> (a) LIMITATION.—The Secretary of the Air Force may not proceed with a decision to retire C–5A aircraft from the active inventory of the Air Force in any number that would reduce the total number of such aircraft in the active inventory below 111 until—
>
> (1) the Air Force has modified a C–5A aircraft to the configuration referred to as the Reliability Enhancement and Reengining Program (RERP) configuration, as planned under the C–5 System Development and Demonstration program as of May 1, 2003; and
>
> (2) the Director of Operational Test and Evaluation of the Department of Defense—
>
> (A) conducts an operational evaluation of that aircraft, as so modified; and
>
> (B) provides to the Secretary of Defense and the congressional defense committees an operational assessment.

(b) OPERATIONAL EVALUATION.—An operational evaluation for purposes of paragraph (2)(A) of subsection (a) is an evaluation, conducted during operational testing and evaluation of the aircraft, as so modified, of the performance of the aircraft with respect to reliability, maintainability, and availability and with respect to critical operational issues.

(c) OPERATIONAL ASSESSMENT.—An operational assessment for purposes of paragraph (2)(B) of subsection (a) is an operational assessment of the program to modify C–5A aircraft to the configuration referred to in subsection (a)(1) regarding both overall suitability and deficiencies of the program to improve performance of the C–5A aircraft relative to requirements and specifications for reliability, maintainability, and availability of that aircraft as in effect on May 1, 2003.

(d) ADDITIONAL LIMITATIONS ON RETIREMENT OF AIRCRAFT.—

The Secretary of the Air Force may not retire C–5 aircraft from the active inventory as of the date of the enactment of this Act until the later of the following:

(1) The date that is 90 days after the date on which the Director of Operational Test and Evaluation submits the report referred to in subsection (a)(2)(B).

(2) The date that is 90 days after the date on which the Secretary submits the report required under subsection (e).

(3) The date that is 30 days after the date on which the Secretary certifies to the congressional defense committees that—

(A) the retirement of such aircraft will not increase the operational risk of meeting the National Defense Strategy; and

(B) the retirement of such aircraft will not reduce the total strategic airlift force structure below 316 strategic airlift aircraft.

(e) REPORT ON RETIREMENT OF AIRCRAFT.—The Secretary of the Air Force shall submit to the congressional defense committees a report setting forth the following:

(1) The rationale for the retirement of existing C–5 aircraft and a cost-benefit analysis of alternative strategic airlift force structures, including the force structure that would result from the retirement of such aircraft.

(2) An updated assessment to the assessment of the Under Secretary for Acquisition, Technology, and Logistics certified on February 14, 2008, concerning the costs and benefits of applying the Reliability Enhancement and Re-engining Program (RERP) modification to the entire the C–5A aircraft fleet.

(3) An assessment of the implications for the Air Force, the Air National Guard, and the Air Force Reserve of operating a mix of C–5A aircraft and C–5M aircraft.

(4) An assessment of the costs and benefits of increasing the number of C–5 aircraft in Back-up Aircraft Inventory (BAI) status as a hedge against future requirements of such aircraft.

(5) An assessment of the costs, benefits, and implications of transferring C–5 aircraft to United States flag carriers operating in the Civil Reserve Air Fleet (CRAF) program or to coalition partners in lieu of the retirement of such aircraft.

(6) Such other matters relating to the retirement of C–5 aircraft as the Secretary considers appropriate.

Section 138 states:

SEC. 138. REPORTS ON STRATEGIC AIRLIFT AIRCRAFT.

At least 90 days before the date on which a C–5 aircraft is retired, the Secretary of the Air Force, in consultation with the Director of the Air National Guard, shall submit to the congressional defense committees a report on the proposed force structure and basing of strategic airlift aircraft (as defined in section 8062(g)(2) of title 10, United States Code). Each report shall include the following:

(1) A list of each aircraft in the inventory of strategic airlift aircraft, including for each such aircraft—

(A) the type;

(B) the variant; and

(C) the military installation where such aircraft is based.

(2) A list of each strategic airlift aircraft proposed for retirement, including for each such aircraft—

(A) the type;

(B) the variant; and

(C) the military installation where such aircraft is based.

(3) A list of each unit affected by a proposed retirement listed under paragraph (2) and how such unit is affected.

(4) For each military installation listed under paragraph (2)(C), changes, if any, to the mission of the installation as a result of a proposed retirement.

(5) Any anticipated reductions in manpower as a result of a proposed retirement listed under paragraph (2).

Section 139 states:

SEC. 139. STRATEGIC AIRLIFT FORCE STRUCTURE.

Subsection (g)(1) of section 8062 of title 10, United States Code, is amended—

(1) by striking ‘‘2008’’ and inserting ‘‘2009’’; and

(2) by striking ‘‘299’’ and inserting ‘‘316.’’

House

The House Armed Services Committee, in its report (H.Rept. 111-166 of June 18, 2009) on H.R. 2647, recommends no funding for the procurement of additional C-17s in FY2010, and instead recommends approving the Administration's request for $88.5 million in procurement funding for other C-17 program expenses. (Page 93)

Section 134 of H.R. 2647 would require the Secretary of the Air Force, in coordination with the Director of the Air National Guard, to submit to the congressional defense committees, at least 120 days before a C-5 is retired, a report on the proposed force structure and basing of C-5 and C-17 aircraft. The text of Section 134 is as follows:

> SEC. 134. REPORTS ON STRATEGIC AIRLIFT AIRCRAFT.
>
> At least 120 days before the date on which a C-5 aircraft is retired, the Secretary of the Air Force, in coordination with the Director of the Air National Guard, shall submit to the congressional defense committees a report on the proposed force structure and basing of strategic airlift aircraft (as defined in section 8062(g)(2) of title 10, United States Code). Each report shall include the following:
>
> (1) A list of each aircraft in the inventory of strategic airlift aircraft, including for each such aircraft—
>
> (A) the type;
>
> (B) the variant; and
>
> (C) the military installation where such aircraft is based.
>
> (2) A list of each strategic airlift aircraft proposed for retirement, including for each such aircraft—
>
> (A) the type;
>
> (B) the variant; and
>
> (C) the military installation where such aircraft is based.
>
> (3) A list of each unit affected by a proposed retirement listed under paragraph (2) and how such unit is affected.
>
> (4) For each military installation listed under paragraph (2)(C), any changes to the mission of the installation as a result of a proposed retirement.
>
> (5) Any anticipated reductions in manpower as a result of a proposed retirement listed under paragraph (2).
>
> (6) Any anticipated increases in manpower or military construction at a military installation as a result of an increase in force structure related to a proposed retirement listed under paragraph (2).

Section 135 of H.R. 2647 would amend 10 USC 8062(g)(1)—the subsection of 10 USC 8062 that was created by Section 132 of the FY2007 defense authorization act (H.R. 5122/P.L. 109-364 of

October 17, 2006)—to state that, effective October 1, 2009 (rather than October 1, 2008), the Secretary of the Air Force shall maintain a total strategic airlift aircraft (i.e., C-5 and C-17) inventory of not less than 316 (rather than 299) aircraft. Assuming the retention of the current force of 111 C-5s, this provision would appear to support a C-17 force of 205 C-7s—the number procured through FY2008.

The committee's report states:

> *Strategic airlift force structure*
>
> The committee notes that the current Mobility Capabilities Study 2005 (MCS–05) identified a range of 292–383 strategic airlift aircraft to meet global mobility requirements with moderate risk. In testimony before the Subcommittee on Air and Land Forces and the Subcommittee on Seapower and Expeditionary Forces on February 25, 2009, the commander of the United States Transportation Command testified that a force structure of 205 C–17s, 52 [fully modernized] C–5Ms, and 59 C–5As modified with the avionics modernization program [AMP], a total of 316 strategic airlift aircraft, meets the requirement to transport 33.95 million ton-miles per day. Additionally, the committee notes that the previous commander of the United States Transportation Command and now current Air Force Chief of Staff, in his letter to the Chairman of the Senate Committee on Armed Services on November 6, 2007, also identified 316 strategic airlift aircraft as the ''sweet spot'' to meet global mobility requirements.
>
> The committee further notes that MCS–05 did not consider the combined Army and Marine Corps increase of 92,000 soldiers and Marines, a potential increase in strategic airlift necessary to transport the Army's future combat systems, or the prospect that future strategic mobility aircraft would be utilized to conduct intra-theater airlift missions to move outsized and oversized equipment as they are now being used in Operation Iraqi Freedom, and believes that the results of MCRS–16 should more accurately identify the inventory of strategic airlift aircraft necessary to meet future strategic airlift mobility requirements.
>
> Accordingly, the committee believes that the long-term strategic airlift force structure inventory required to meet global mobility requirements may be subject to future adjustment based on the results of the Mobility Capability Requirement Study 2016 (MCRS–16) scheduled for completion in December 2009, and encourages a continued dialogue between the Office of the Secretary of Defense, senior uniformed military officials, and the congressional defense committees. The committee also recommends a provision elsewhere in this title [Section 135] that would amend subsection (g)(1) of section 8062, United States Code, by striking ''299'' and inserting ''316.'' (Pages 101-102)

Section 1032 would require a report on the force structure findings of the 2009 Quadrennial Defense Review (QDR). 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:...
>
> (2) A description of the factors that informed decisions regarding strategic and tactical airlift force structure, including: the modeling, simulations, and analyses used to determine the number and type of airlift aircraft necessary to meet the national defense strategy; the number and type of airlift aircraft necessary to meet the national defense strategy; the changes made, and supporting rationale for the changes made, to the airlift force structure from that proposed in Mobility Capabilities Study 2005 (MCS–05), including numbers of airlift aircraft necessary to meet additional demands for increased Army and Marine Corps personnel, airlift necessary to transport the Army's future combat systems, and the use of

> airlift aircraft in intra-theater airlift missions; the force sizing constructs used, including peak demand as measured in millions of ton-miles per day and force structure necessary to meet peak demand including the number of C–17s, C–5s, C–130s, C–27s, and civil reserve air fleet; and the operational risks associated with the planned strategic and tactical airlift aircraft fleet, based on requirements of combatant commanders, and measures planned to address those risks; ... (Pages 387-388)

Senate

Division D of the FY2010 defense authorization bill (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 no funding for the procurement of additional C-17s in FY2010, and instead recommends approving the Administration's request for $88.5 million in procurement funding for other C-17 program expenses. (Page 630 of the printed bill.)

Section 121 of S. 1390 would prohibit the Secretary of the Air Force from proceeding with a decision to retire C-5As until certain conditions are met, and require the Secretary of the Air Force to submit a report to the congressional defense committees on the issue of C-5 retirement. The text of Section 121 is as follows:

> SEC. 121. LIMITATION ON RETIREMENT OF C-5 AIRCRAFT.
>
> (a) Limitation- The Secretary of the Air Force may not proceed with a decision to retire C-5A aircraft from the active inventory of the Air Force in any number that would reduce the total number of such aircraft in the active inventory below 111 until—
>
> (1) the Air Force has modified a C-5A aircraft to the configuration referred to as the Reliability Enhancement and Reengining Program (RERP) configuration, as planned under the C-5 System Development and Demonstration program as of May 1, 2003; and
>
> (2) the Director of Operational Test and Evaluation of the Department of Defense—
>
> (A) conducts an operational evaluation of that aircraft, as so modified; and
>
> (B) provides to the Secretary of Defense and the congressional defense committees an operational assessment.
>
> (b) Operational Evaluation- An operational evaluation for purposes of paragraph (2)(A) of subsection (a) is an evaluation, conducted during operational testing and evaluation of the aircraft, as so modified, of the performance of the aircraft with respect to reliability, maintainability, and availability and with respect to critical operational issues.
>
> (c) Operational Assessment- An operational assessment for purposes of paragraph (2)(B) of subsection (a) is an operational assessment of the program to modify C-5A aircraft to the configuration referred to in subsection (a)(1) regarding both overall suitability and deficiencies of the program to improve performance of the C-5A aircraft relative to requirements and specifications for reliability, maintainability, and availability of that aircraft as in effect on May 1, 2003.

(d) Additional Limitations on Retirement of Aircraft- The Secretary of the Air Force may not retire C-5 aircraft from the active inventory as of the date of this Act until the later of the following:

(1) The date that is 150 days after the date on which the Director of Operational Test and Evaluation submits the report referred to in subsection (a)(2)(B).

(2) The date that is 120 days after the date on which the Secretary submits the report required under subsection (e).

(3) The date that is 30 days after the date on which the Secretary certifies to the congressional defense committees that—

(A) the retirement of such aircraft will not increase the operational risk of meeting the National Defense Strategy; and

(B) the retirement of such aircraft will not reduce the total strategic airlift force structure below 324 strategic airlift aircraft.

(e) Report on Retirement of Aircraft- The Secretary of the Air Force shall submit to the congressional defense committees a report setting forth the following:

(1) The rationale for the retirement of existing C-5 aircraft and a cost/benefit analysis of alternative strategic airlift force structures, including the force structure that would result from the retirement of such aircraft.

(2) An assessment of the costs and benefits of applying the Reliability Enhancement and Re-engining Program (RERP) modification to the entire the C-5A aircraft fleet.

(3) An assessment of the implications for the Air Force, the Air National Guard, and the Air Force Reserve of operating a mix of C-5A aircraft and C-5M aircraft.

(4) An assessment of the costs and benefits of increasing the number of C-5 aircraft in Back-up Aircraft Inventory (BAI) status as a hedge against future requirements of such aircraft.

(5) An assessment of the costs, benefits, and implications of transferring C-5 aircraft to United States flag carriers operating in the Civil Reserve Air Fleet (CRAF) program or to coalition partners in lieu of the retirement of such aircraft.

(6) Such other matters relating to the retirement of C-5 aircraft as the Secretary considers appropriate.

(f) Maintenance of Aircraft Upon Retirement- The Secretary of the Air Force shall maintain any C-5 aircraft retired after the date of the enactment of this Act in Type 1000 storage until opportunities for the transfer of such aircraft as described in subsection (e)(5) have been fully exhausted.

FY2010 DOD Appropriations Bill (H.R. 3326)

Final Version

In lieu of a conference report, the House Appropriations Committee on December 15, 2009, released an explanatory statement on a final version of H.R. 3326. This version was passed by the

House on December 16, 2009, and by the Senate on December 19, 2009, and signed into law on December 19, 2009, as P.L. 111-118. The explanatory statement states on page 1 that it "is an explanation of the effects of Division A [of H.R. 3326], which makes appropriations for the Department of Defense for fiscal year 2010. As provided in Section 8124 of the consolidated bill, this explanatory statement shall have the same effect with respect to the allocation of funds and the implementation of this as if it were a joint explanatory statement of a committee of the conference."

The explanatory statement includes $2,588.5 million for procurement of 10 C-17s in FY2010, an increase of $2,500.0 million over the administration request. As Congress decided to continue production, the administration request for $91.4 million in post-production support was not funded.

The explanatory statement provides for the rescission of $22.4 million from Air Force research and development funds for the C-17 without further explanation.

The budget for modification of in-service C-17s in the explanatory statement is reduced by $17.4 million, from the request of $469.7 million to $352.3 million. This is the sum of a number of specific reductions shown in the following table:

Table A-1. Revisions to In-Service Modification Request

Item reduced	Amount ($1000s)
Reduction for other government costs—LAIRCM	-4,023
Excess install funding for pylon stubs	-800
Funding prior to installs ELT frequency change	-1,586
Excess install funding for Block 13 to 17 retrofits	-115,748
Excess install funding for OBIGGS II	-7,700
Excess install funding for extended range retrofit	-22,700
Funding requested ahead of need LAIRCM for the ANG	-133,400

The text of H.R. 3326 includes the following provision:

> *Provided*, That none of the funds provided in this Act for modification of C-17 aircraft may be obligated until all C-17 contracts funded with prior year `Aircraft Procurement, Air Force' appropriated funds are definitized unless the Secretary of the Air Force certifies in writing to the congressional defense committees that each such obligation is necessary to meet the needs of a warfighting requirement or prevents increased costs to the taxpayer and provides the reasons for failing to definitize the prior year contracts along with the prospective contract definitization schedule.

The explanatory statement also includes the following provision:

> C-17 GLOBEMASTER III
>
> The recent actions of the Air Force to address and curtail the wide use of undefinitized contract actions (UCA) are encouraging. To further encourage a sense of urgency to reduce the number of UCAs, bill language has been included that limits obligations for modifications until all C-17 UCAs funded with prior year "Aircraft Procurement, Air Force" funds are definitized or certifications of need are made by the Secretary of the Air Force.

> The Under Secretary of Defense (Acquisition, Technology and 'Logistics) (USD(AT&L)) is directed to review contracting procedures within the Air Force and provide a report to the congressional defense committees not later than 90 days after enactment of this Act detailing a strategy to reduce current and minimize further undefinitized contracts in the Air Force. Additionally, the USD(AT&L) is directed to provide to the congressional defense committees a consolidated list of undefinitized contracts within the Department of Defense by November 15 and April 15 of each year.
>
> The recommendation provides an additional $2,500,000,000 for the procurement of ten C-l 7 aircraft, associated spares, support equipment and training equipment as required.

House

The House Appropriations Committee, in its report (H.Rept. 111-230 of July 24, 2009) on H.R. 3326, recommended $762.6 million in procurement funding for the C-17 program, including $674.1 million for the procurement of three C-17s. (Page 187)

The report recommends a $152.6 million reduction in the amount of procurement funding requested for the modification of in-service C-17s, mostly for "Excess Install[ation] funding" for certain pieces of equipment, and a $91.4 million reduction (a 100% reduction) in the amount of procurement funding requested for C-17 post-production support for "Program Reduction." (Pages 188 and 189).

The paragraph in the bill that makes funding available for the procurement of Air Force aircraft states that the funds are made available, "*Provided*, That no funds provided in this Act for the procurement or modernization of C-17 aircraft may be obligated until all C-17 contracts funded with prior year `Aircraft Procurement, Air Force' appropriated funds are definitized."

The report recommends approving the requests in the Overseas Contingency Operations (OCO) part of the budget for $132.3 million in procurement funding for the modification of in-service C-17s[45] and for $11 million in procurement funding for C-17 post-production support. (Page 358)

The committee's report states:

> C–17 AIRCRAFT
>
> The C–17 Globemaster III aircraft has been the supply and logistics workhorse of the ongoing overseas conflicts. This platform has been responsible for the airlift of more cargo and personnel than any other platform. In recognition of the platforms contributions to the Nation's security, the Committee provides an additional $674,100,000 for the procurement of three C–17 aircraft. The Committee recognizes that this is well below the minimum sustaining rate required for the production line. In an effort to avoid the extremely high costs associated with small production lots, the Committee's intent is that these aircraft be absorbed into the fiscal year 2009 production run that was funded from the Supplemental Appropriations Act, 2009, to create a full production run funded over a two year period. The Committee intends that the pricing for these aircraft be consistent with the 2009 aircraft, using methods such as a fixed price option to the fiscal year 2009 production contract. (Page 191)

[45] The report of the Senate Appropriations Committee on H.R. 3326 (see discussion below) states that the requested figure was $120.7 million.

The report also states:

> UNDEFINITIZED CONTRACT ACTIONS
>
> The Committee has become aware of the excessive use of undefinitized contract actions (UCA's) by the Air Force. Based on information obtained by the Committee, it is apparent that the Air Force has not provided the proper oversight of contracting activities within various programs. Specifically, the C–17 aircraft program has billions of dollars in undefinitized contracts. The Defense Federal Acquisition Regulations (DFAR) very clearly stipulate in subpart 217.74 that UCA's are to be used as the exception not as the rule for urgent needs. It is common practice for the C–17 program to place all of its funding on a UCA and then immediately obligate up to 50 percent of the not-to-exceed price at the award which is a disincentive to definitize the contract. Further, the DFAR requires that the contract must be definitized within 180 days after the issuance of initial undefinitized action unless it is extended by another 180 days after the contractor submits a qualifying proposal. The C–17 program has numerous contracts well in excess of these timelines with proposal times for fiscal year 2007 funds ranging from 373 to 975 days and on average 688 days to definitize. This use of UCA's places the taxpayer at a severe disadvantage when negotiating contracts since the contractor has little incentive to control costs while performing work under a UCA.
>
> Even more concerning to the Committee, is that this excessive use of UCA's is not just isolated to procurement and modernization programs but has migrated to operation and maintenance programs. Based on information supplied by the Air Force, a Deputy Assistant Secretary of the Air Force for Contracting memorandum dated 28 November 2001 authorized the waiver of the limitations in the DFAR for definitization schedule and obligations for UCAs that support overseas operations. With this memorandum as justification, the Air Force has placed the fiscal year 2009 C–17 depot funding on a UCA which is still not definitized in the fourth quarter of the fiscal year even though the Air Force has obligated 89.7 percent of the $1,118,679,167 not-to-exceed price. This rationale for the use of a undefinitized contracts for routine activities is abusive. The Committee directs the Secretary of the Air Force to address this situation within 30 days of enactment of this Act to include the cancellation of the November 2001 memorandum. The Committee further directs the Air Force to provide a detailed report to the congressional defense committees of all undefinitized UCA's in excess of $50,000,000 within 30 days of enactment of this Act. The report shall include the date the UCA was initiated, the not-to-exceed price, the amount obligated on the UCA, and the planned date for definitization.
>
> While the Committee understands the need at times for programs to use this type of contracting mechanism, it appears that the Air Force has grossly abused it with respect to volume, value, and time to definitize. The Committee insists that the Air Force finalize all existing undefinitized contract actions in an expedited manner and to minimize the use of UCA's the future. To encourage a sense of urgency, the Committee has included a new proviso in the Aircraft Procurement, Air Force appropriating paragraph which specifies that for C–17 procurement and modernization efforts funded with Aircraft Procurement, Air Force the obligation of fiscal year 2010 procurement funds is prohibited until the existing UCA's are definitized. The Committee further directs the Undersecretary of Defense, Acquisition, Technology and Logistics (USD(AT&L)) to review contracting procedures within the Air Force and provide a report to the congressional defense committees within 90 days of enactment of this Act detailing a strategy to reduce current and minimize future undefinitized contracts in the Air Force. (Pages 190-191)

Section 8041 of the bill as reported would rescind certain FY2009 appropriations for DOD programs. The committee's report states that the funds that would be rescinded include $70 million in FY2009 research and development funding for the C-17 program. (Page 324)

A July 28, 2009, statement of administration policy on H.R. 3326 as reported in the House states:

> *C-17 Transport Aircraft.* The Administration strongly objects to the addition of $674 million in funding for three unrequested C-17 airlift aircraft. Analyses by DOD have shown that the 205 C-17s in the force and on order, together with the existing fleet of C-5 aircraft, are sufficient to meet the Department's future airlift needs, even under the most stressing situations.[46]

Senate (Committee Report)

The Senate Appropriations Committee, in its report (S.Rept. 111-74 of September 10, 2009) on H.R. 3326, recommends $2,588.5 million in procurement funding for the C-17 program, including $2,500.0 million for the procurement of 10 C-17s. (Page 133)

The report recommends a $45.3 million reduction in the amount of procurement funding requested for the modification of in-service C-17s for "Funding requested ahead of need," and a $91.4 million reduction (a 100% reduction) in the amount of procurement funding requested for C-17 post-production support for "Funding requested ahead of need." (Page 133)

The report recommends approving the requests in the Overseas Contingency Operations (OCO) part of the budget for $120.7 million in procurement funding for the modification of in-service C-17s[47] and for $11 million in procurement funding for C-17 post-production support. (Page 261)

Section 8040 of the bill as reported would rescind certain FY2008 and FY2009 appropriations for DOD programs. The committee's report states that the funds that would be rescinded include $22.4 million in FY2009 research and development funding for the C-17 program. (Page 230)

The report "directs that the National Guard and Reserve Equipment program shall be executed by the heads of the Guard and Reserve components with priority consideration given to" several items, including Large Aircraft Infrared Countermeasures (LAIRCM) systems for C-17s. (Page 151)

A September 25, 2009, statement of administration policy on H.R. 3326 as reported in the Senate states:

> *C-17 Transport Aircraft.* The Administration strongly objects to the addition of $2.5 billion in funding for 10 unrequested C-17 airlift aircraft. Analyses by DOD have shown that the 205 C-17s in the force and on order, together with the fleet of C-5 aircraft, are sufficient to meet the Department's future airlift needs, even under the most stressing situations.[48]

[46] Statement of Administration Policy: H.R. 3326—Department of Defense Appropriations Act, 2010, July 28, 2009 (House), available online at http://www.presidency.ucsb.edu/ws/index.php?pid=86466.

[47] The report of the House Appropriations Committee on H.R. 3326 (see discussion above) states that the requested figure was $132.3 million.

[48] Statement of Administration Policy: H.R. 3326—Department of Defense Appropriations Act, 2010, September 25, 2009 (Senate), available online at http://www.presidency.ucsb.edu/ws/index.php?pid=86689.

Senate (Floor Consideration)

Senate Amendment 2558

S.Amdt. 2558, proposed on September 29, 2009, would strike from H.R. 3326 funding for C-17 procurement in excess of the amount requested by administration (i.e., it would strike the $2.5 billion in the bill for the procurement of 10 C-17s) and make that funding available instead for operation and maintenance in accordance with amounts requested by the administration, and for the Operation and Maintenance, Army account for overseas contingency operations.

On September 30, the Senate considered S.Amdt. 2558. A point of order was raised with respect to the amendment. The Senate, by a vote of 34 to 64 (Record Vote Number 303), rejected a motion to waive the Budget Act with respect to the amendment, and the amendment was ruled out of order.

Senate Amendment 2580

On October 6, a new amendment—S.Amdt. 2580—was proposed to strike from H.R. 3326 funding for C-17 procurement in excess of the amount requested by the administration. This amendment was structured to avoid the point of order that was raised with respect to S.Amdt. 2558. On October 6, the Senate rejected S.Amdt. 2580 by a vote of 30 to 68 (Record Vote Number 312).

FY2009 Supplemental Appropriations Act (H.R. 2346/P.L. 111-32)

House

The House Appropriations Committee, in its report (H.Rept. 111-105 of May 12, 2009) on the FY2009 supplemental appropriations bill (H.R. 2346), recommended $2.2452 billion for the procurement of eight additional C-17s. (Page 21) The report stated:

> C–17 GLOBEMASTER III
>
> The Committee recommendation includes $2,245,200,000 for the procurement of eight C–17 Globemaster III aircraft. The C–17 is the workhorse of the theater, flying fifty percent of all sorties for the United States Transportation Command over the last 24 months. These missions range from airdrops for troops in forward locations to aeromedical evacuation of servicemembers from theater back to the United States. While the aircraft is designed to fly 1,000 hours per year over 30 years, over the last ten years the C–17 fleet has averaged 1,250 hours per aircraft with some aircraft flying in excess of 2,400 hours in a single year. This heavy usage is reducing the expected service life of the aircraft. The aircraft included in the recommendation will alleviate some of these issues by introducing new aircraft into the inventory.
>
> Further, the Committee is concerned that a decision on the continuation of the C–17 program was announced prior to the completion of the Mobility Capability and Requirements Study (MCRS), which will address the needs of the Department of Defense in 2016. Since the last MCRS in 2005, several changes have occurred that would change previous requirements to include the growth of ground forces, the increased size and use of Special Operations Forces, additional use of the C–17 in an intra-theater role, and the stand up of a new combatant

> command—United States Africa Command. It seems more prudent to continue the C–17 program until the results of the study are announced later this year.
>
> Additionally, the Air Force is encouraged to work with Congress and the reserve component to replace aging C–5A aircraft with C–17 aircraft. While there are concerns that reserve component aircraft are not utilized at the same rate as aircraft assigned to Air Mobility Command, the Committee believes that the Air Force can develop plans to work with the reserve component to address some of these issues (i.e. active association with Guard units). (Pages 24-25)

Senate

The Senate Appropriations Committee, in its report (S.Rept. 111-20 of May 14, 2009) on the FY2009 supplemental appropriations bill (S. 1054), recommended no funding for the procurement of additional C-17s, and instead recommended rejecting a request that the Administration had made for $230.2 million in FY2009 supplemental funding to cover other C-17 program expenses. (Page 43)

Conference

The conference report (H.Rept. 111-151 of June 12, 2009) on H.R. 2346 (P.L. 111-32 of June 24, 2009) provided $2.172 billion for the procurement of eight additional C-17s. (Page 93)

Section 311 of the act repealed Section 132 of the FY2004 defense authorization act (H.R. 1588/P.L. 108-136 of November 24, 2003)[49] and permits the Secretary of the Air Force to retire C-5As 15 days after certifying to the congressional defense committees that retiring the aircraft will not significantly increase operational risk of not meeting the national defense strategy, and provided that such retirements may not reduce total strategic airlift force structure inventory below the 292 strategic airlift aircraft level identified in the Mobility Capability Study 2005 (MCS-05) unless otherwise addressed in the FY2010 defense authorization act.

Author Contact Information

(name redacted)
Specialist in Military Aviation
[redacted]@crs.loc.gov, 7-....

[49] Section 132 of the H.R. 1588/P.L. 108-136 prohibited the Secretary of the Air Force from proceeding with a decision to retire C-5As from the active inventory of the Air Force in any number that would reduce the total number of C-5As in the active inventory below 112 (effectively now 111, following the crash in 2006 of a C-5 in 2006) until the Air Force modified a C-5A aircraft to RERP configuration and DOD's Director of Operational Test and Evaluation conducted an operational evaluation of that aircraft and provided to the Secretary of Defense and the congressional defense committees an operational assessment.