



April 2016

KC-46 TANKER AIRCRAFT

Challenging Testing and Delivery Schedules Lie Ahead

Accessible Version

GAO Highlights

Highlights of [GAO-16-346](#), a report to congressional committees

Why GAO Did This Study

Aerial refueling—when aircraft refuel while airborne—allows the U.S. military to fly farther, stay airborne longer, and transport more weapons, equipment, and supplies. The Air Force initiated the KC-46 program to replace its aging KC-135 aerial refueling fleet. Boeing was awarded a fixed price incentive contract with a ceiling price of \$4.9 billion to develop the first four aircraft, which will be used for testing. Boeing is contractually required to deliver the four development aircraft between April and May 2016. Boeing is also required to deliver a total of 18 aircraft by August 2017, which could include some of the development aircraft if they are brought to operational configuration. The program plans to eventually field 179 aircraft in total.

The National Defense Authorization Act for Fiscal Year 2012 included a provision for GAO to review the KC-46 program annually through 2017. This report addresses progress made in 2015 toward (1) meeting cost and performance goals and (2) delivering the aircraft on schedule. GAO analyzed key cost, schedule, development, test, and manufacturing documents and discussed results with officials from the KC-46 program office, other defense offices, the FAA, and Boeing, the prime contractor.

What GAO Recommends

GAO is not making recommendations at this time. DOD's technical comments on a draft are incorporated as appropriate in the final report.

View [GAO-16-346](#). For more information, contact Michael Sullivan at (202) 512-4841 or sullivanm@gao.gov.

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KC-46 TANKER AIRCRAFT

Challenging Testing and Delivery Schedules Lie Ahead

What GAO Found

KC-46 tanker aircraft acquisition cost estimates have decreased for a third consecutive year and the prime contractor, Boeing, is expected to achieve all the performance goals, such as those for air refueling and airlift capability. As the table below shows, the total acquisition cost estimate has decreased from \$51.7 billion in February 2011 to \$48.2 billion in December 2015, about 7 percent, due primarily to stable requirements that led to fewer than expected engineering changes. The fixed price development contract also protects the government from paying for any development costs above the contract ceiling price.

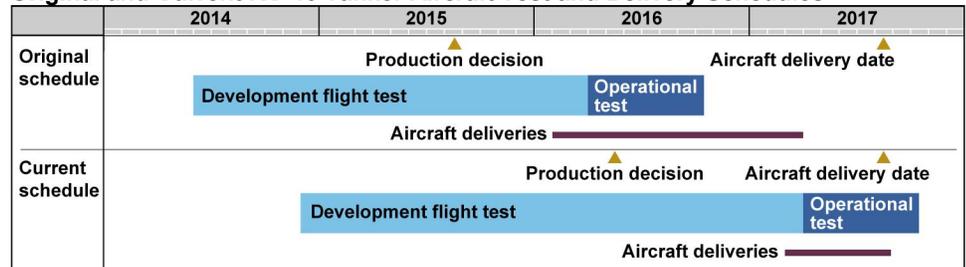
Changes in Total Program Acquisition Costs for the KC-46 Tanker Aircraft
then-year dollars in millions

	February 2011	December 2015	Change
Development	\$7,149.6	\$6,259.6	-12.4%
Procurement	\$40,236.0	\$38,764.9	-3.7%
Military Construction	\$4,314.6	\$3,187.5	-26.1%
Total	\$51,700.2	\$48,212	-6.7%

Source: GAO presentation of Air Force data. | GAO-16-346

Regarding the schedule, the program office delayed the low-rate initial production decision 9 months because Boeing had problems developing the first four aircraft. Boeing has largely addressed the problems, but proposed a new schedule to reflect the delays. (See figure below.) Boeing still plans to deliver 18 operational aircraft to the Air Force by August 2017—assuming the Air Force approves production. Operational testing will be completed later, in October 2017. While aircraft deficiencies could be discovered late, the plan presents little cost risk to the government because Boeing must correct deficiencies using its own resources. Boeing plans to deliver the aircraft over 6 months, instead of 14.

Original and Current KC-46 Tanker Aircraft Test and Delivery Schedules



Source: GAO analysis of KC-46 program data. | GAO-16-346

Note: The original schedule included delivery of four development aircraft in operational configuration by May 2016. Under the current schedule the last of these aircraft will be delivered by November 2017.

Boeing has a challenging road ahead to complete testing and deliver aircraft.

Test officials believe Boeing's test schedule is optimistic and it may not have all aircraft available when needed to complete planned testing. Boeing also has not gotten several key aerial refueling parts qualified by the Federal Aviation Administration (FAA) and cannot get final FAA certification of KC-46 aircraft until this occurs. Program officials estimate there are 4 months of schedule risk to delivering 18 aircraft by August 2017 due to testing and parts qualification issues. Boeing is working on ways to mitigate the schedule risks.

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Abbreviations

DOD Department of Defense
FAA Federal Aviation Administration

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April 8, 2016

Congressional Committees

The KC-46 tanker aircraft modernization program, valued at \$48 billion, is among the Air Force’s highest acquisition priorities and is intended to provide aerial refueling to Air Force, Navy, Marine Corps, and allied aircraft. The program recently completed its fifth year of a planned 7-year development program to convert a commercial aircraft into an aerial refueling tanker. Aerial refueling—the transfer of fuel from airborne tankers to combat and airlift forces—is critical to the U.S. military’s ability to effectively operate globally. KC-46 aircraft are expected to replace almost 40 percent of the Air Force’s aging aerial refueling tanker fleet, which totals 455 aircraft, and is primarily made up of the KC-135 Stratotanker. According to Air Force Air Mobility Command officials, the KC-135 fleet is heavily used, with one taking off every 12 minutes in fiscal year 2015 to complete nearly 44,000 missions. On average, these tankers refuel 236 aircraft every day. However, they are now 55 years old on average and require substantial maintenance, spending more than 24 percent of their time in repair. The Air Force plans to develop, test, and accept delivery of 18 KC-46 tankers by August 2017, and eventually field a total of 179 aircraft. The KC-46 fleet is expected to provide more refueling capacity, efficiency, and capabilities than its predecessor.

The National Defense Authorization Act for Fiscal Year 2012 included provisions for GAO to review and report on the KC-46 program through 2017.¹ This is our fifth report reviewing the program. In this report, we evaluate program progress made in 2015 toward (1) meeting cost and performance goals; and (2) achieving schedule targets. See the Related GAO Products section for a list of our previous reports on the KC-46 program.

To assess progress toward meeting cost and performance goals, we examined Department of Defense (DOD) and Air Force cost estimates contained in defense acquisition executive summary reports, selected acquisition reports, and program briefings and we examined current estimates of key and technical performance capabilities contained in program briefings. To assess progress toward achieving schedule

¹Pub. L. No. 112-81 § 244 (2011).

targets, we examined various program office, Defense Contract Management Agency, and Boeing (who is the prime contractor) documents that allowed us to compare (1) program milestones established at the start of development to current estimates, (2) planned to actual ground and flight test hours and activities, and (3) original to current production plans. Among others, documents included program office schedule analyses, integrated test team documents, Defense Contract Management Agency monthly assessments of the KC-46 program, and Boeing production schedules. We also examined annual reports issued by the Deputy Assistant Secretary of Defense for Test and Evaluation and the Director of Operational Test and Evaluation. As part of our overall review, we attended monthly meetings between the program office and Boeing to obtain additional insight on program progress. We visited Boeing production facilities. Finally, we interviewed officials from the Air Force's KC-46 program office, other defense offices, the Federal Aviation Administration (FAA), and Boeing on progress made in 2015. We assessed the reliability of cost, schedule, test, and manufacturing data by interviewing agency officials knowledgeable about the data, and we determined that the data were sufficiently reliable for the purposes of this report.

We conducted this performance audit from July 2015 to April 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

In February 2011, Boeing won the competition to develop the Air Force's next generation aerial refueling tanker aircraft, the KC-46. Boeing was awarded a fixed price incentive (firm target) contract for development because KC-46 development was considered to be a relatively low-risk effort to integrate military technologies onto a 767 aircraft designed for commercial use. The contract is designed to hold Boeing accountable for costs associated with the design, manufacture, and delivery of four test aircraft and includes options to manufacture the remaining 175 aircraft. It features two key delivery dates, requiring Boeing to first deliver four development aircraft between April and May 2016, and second, if the Air Force exercises the first two production options, deliver a total of 18

operational aircraft by August 2017. It also specifies that Boeing must correct any deficiencies and bring development and production aircraft to the final configuration at no additional cost to the government.² In addition, all required aircrew and maintainer training must be complete and the required support equipment and sustainment support must be in place by August 2017. The contract includes firm-fixed-price contract options for the first and second production lots in 2016, and options with “not-to-exceed” ceiling prices for lots 3 through 13.³ Barring any changes, the development contract specifies a target price of \$4.4 billion and a ceiling price of \$4.9 billion, at which point Boeing assumes responsibility for all additional costs. By December 2015, both Boeing and the program office estimated that Boeing would incur additional costs to complete development of the aircraft of about \$769 million and \$1.4 billion, respectively.

To develop a tanker, Boeing modified a 767 aircraft in two phases: In the first phase, Boeing modified the design of the 767 with a cargo door and an advanced flight deck display, borrowed from its new 787, and is calling this modified design the 767-2C. The 767-2C is being built on Boeing’s existing production line. In the second phase, a 767-2C was militarized and brought to a KC-46 configuration.

The KC-46 will allow for two types of refueling to be employed in the same mission— a refueling boom that is integrated with a computer-assisted control system and a permanent hose and drogue refueling system. The boom is a rigid, telescoping tube that an operator on the tanker aircraft extends and inserts into a receptacle on the aircraft being refueled. The “hose and drogue” system involves a long, flexible refueling hose stabilized by a drogue (a small windsock) at the end of the hose. See Figure 1 for a depiction of the conversion of the 767 aircraft into the KC-46 tanker with the boom deployed.

²According to program officials, Boeing could bring development aircraft to operational configuration and use them as part of the 18 aircraft it delivers by August 2017.

³For purposes of this report, a production lot refers to a set number of aircraft that must be built and delivered in a given time frame. For example, the first production lot includes seven aircraft that are now scheduled to be built and delivered to the Air Force between March and April 2017.

Figure 1: Conversion of Boeing 767 into a KC-46 Aerial Refueling Tanker



Source: GAO analysis of Boeing data (data); © Boeing (images). | GAO-16-346

The FAA has previously certified Boeing’s 767 commercial passenger airplane (referred to as a type certificate) and will certify the design for both the 767-2C and the KC-46 with amended and supplemental type certificates, respectively. The Air Force is responsible for certifying that the KC-46 works as intended. The Air Force will also verify that the KC-46 systems meet contractual requirements and certify the KC-46 with various specified receiver aircraft for refueling operations.

Estimated Program Costs Are Decreasing and Performance Goals Are Expected to Be Met

For the third consecutive year, the program office has reduced its acquisition cost estimate and it continues to estimate that Boeing will meet performance goals. The total KC-46 program acquisition cost estimate (development, procurement, and military construction costs) has decreased \$3.5 billion or about 7 percent—from \$51.7 billion to \$48.2 billion—since the program started in February 2011. The decrease is due primarily to stable requirements, fewer than expected engineering changes, and changes in military construction plans. In addition, the government competitively awarded a contract for an aircrew training system at a lower price than originally projected. Average program acquisition unit costs have decreased by about the same percent because quantities have remained the same. Table 1 provides a comparison of the initial and current quantity and cost estimates for the program.

Table 1: Initial and Current KC-46 Tanker Aircraft Program Quantities and Acquisition Costs

	Component	February 2011	December 2015	Change	Difference
Expected quantities	Development quantities	4	4	--	0.0
	Procurement quantities	175	175	--	0.0
	Total quantities	179	179	--	0.0
Cost estimates (then-year dollars in millions)	Development	\$7,149.6	\$6,259.6	-12.4%	\$890.0
	Procurement	\$40,236.0	\$38,764.9	-3.7%	\$1,471.1
	Military Construction	\$4,314.6	\$3,187.5	-26.1%	\$1,127.1
Total program acquisition	Not applicable	\$51,700.2	\$48,212	-6.7%	\$3,488.2
Unit cost estimates (then-year dollars in millions)	Average program acquisition	\$288.8	\$269.3	-6.8%	\$19.5

Source: GAO presentation of Air Force Data. | GAO-16-346

Note: Then-year dollars include the effects of inflation and escalation.

The current development cost estimate of \$6.3 billion includes: \$4.9 billion for Boeing’s aircraft development contract; nearly \$1 billion for other costs, including training systems development, program office support, and test and evaluation support; and roughly \$400 million for risks associated with developing the aircraft and training systems.

The program office estimates that Boeing will meet key performance capabilities, such as those related to air refueling and airlift, but has not yet fully verified the estimates through ground and flight testing. Boeing has developed a set of seven technical performance measures to gauge its progress toward meeting these key capabilities, and the program currently predicts that Boeing is on track to meet these measures. For example, the program projects that the aircraft will be able to perform one of its assigned missions at least 92 percent of the time, and that maintainers will be able to fix aircraft problems within 12 hours at least 71 percent of the time. Appendix I lists the status of KC-46 technical performance capabilities.

Program Has Revised Testing and Delivery Schedules Due to Problems Early in Development

The KC-46 program originally planned to hold its low-rate initial production decision⁴ in August 2015, but had to delay the decision 9 months, to May 2016, because Boeing experienced problems developing the aircraft. Although these problems have largely been addressed, Boeing and the government had to revise test and delivery schedules. The changes deferred development aircraft deliveries and, if the Air Force exercises its first two production lot options, will compress production aircraft deliveries. As Boeing implements the new schedule, challenges to flight test completion could affect its ability to deliver aircraft on time.

Boeing Experienced Problems Developing the Aircraft that Delayed the Production Decision

Since the critical design review in July 2013, Boeing has made progress developing the aircraft's systems, including the extensive electrical and fueling systems that will allow the KC-46 to perform its primary mission. Boeing has also developed and integrated the software needed to support KC-46 operations. Boeing, however, experienced three major development challenges that ultimately contributed to a 9-month delay to the low-rate initial production decision. The following is a summary of these development challenges and steps Boeing has taken to address them.

Wiring design issues: Wiring on the first development aircraft was nearly complete in the spring of 2014 when Boeing discovered wire separation issues caused by an incorrect wiring design. Boeing officials told us that a subsequent wiring audit found thousands of wire segments that needed to be changed. Boeing officials estimate that these changes affected about 45 percent of the 1,700 wire bundles on the aircraft. Boeing suspended wiring installation on the remaining three development aircraft for several months while it worked through the wiring issues on the first development aircraft. The required wiring rework led to a delay in the first flight of the first development aircraft and to manufacturing delays on the other development aircraft. Although Boeing has largely addressed this issue, it continues to execute some wiring rework across each of the development aircraft.

Aerial refueling system redesign: Boeing identified several aerial refueling parts that needed to be redesigned. For example, according to program

⁴The low-rate initial production decision establishes the initial production base for the system or capability increment, provides the test articles for initial operational test and evaluation, provides an efficient ramp up to full-rate production, and maintains continuity in production pending completion of operational test and evaluation.

officials, the single-point refueling manifold, which is a mechanism that distributes and regulates the flow of fuel to various components, contained a coupler that was not built to withstand the pressure experienced during refueling operations. Following failures during testing, Boeing redesigned the manifold and began using a coupler manufactured by a different supplier. According to officials, Boeing also determined that the process used to manufacture the fuel system's fuel tube welds did not meet requirements. Boeing has since changed the weld process and implemented an x-ray inspection process for these parts. The process changes caused a delay to the first flight of the second development aircraft, which is being used for aerial refueling testing.

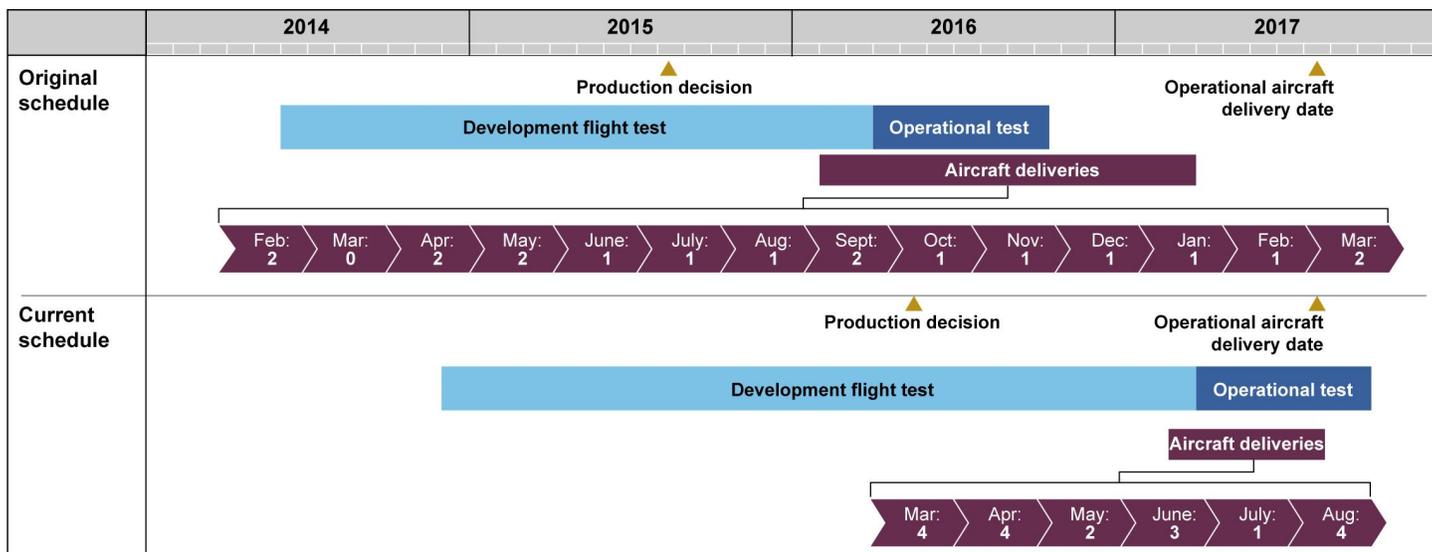
Fuel contamination: A mislabeled fuel substitute used for ground testing in July 2015 led to the contamination of the fuel system on the second development aircraft and resulted in another delay to its first flight. According to Boeing, a distributor provided a product improperly labeled as a fluid approved for use as a fuel substitute. The material provided by the distributor and used during a ground test was an industrial cleaner and is highly damaging to aluminum. The incident became apparent when seals in the fuel system began to leak about 30 days after the substance was introduced. By then, the aircraft's centerline drogue system, fuel manifold, and piping were corroded. Due to the extent of the corrosion, Boeing had to take parts from the third development aircraft to repair the second development aircraft's damaged fuel system. Since that time, Boeing has had difficulty obtaining replacement parts for the third development aircraft from a new supplier and had to delay some testing on that aircraft. Boeing considers the contamination of the fuel system a one-time event and no longer uses the supplier responsible for mislabeling the packaging of the fuel substitute.

Boeing Plans to Deliver Aircraft in a Compressed Timeframe

As a result of the development problems, Boeing has used all of its schedule reserve and had to revise its testing schedule. To preserve the August 2017 operational aircraft delivery date, Boeing and the Air Force also had to revise the aircraft delivery schedule. Originally, Boeing contracted to complete developmental flight testing and deliver the four development aircraft by April and May 2016. Boeing planned to conduct operational testing starting in April 2016 and to complete that testing in October 2016. Boeing also planned to bring the four development aircraft to operational configuration and deliver those aircraft, along with 14 additional production aircraft, to the Air Force over 14 months, prior to August 2017.

The current schedule is much more compressed because Boeing has not completed the developmental flight test program. As of January 2016 Boeing has two development aircraft flying developmental flight tests. The other two aircraft are expected to be ready for developmental flight testing in early March and April 2016, respectively. Boeing now plans to deliver four production aircraft to the Air Force to begin operational testing in May 2017, a year later than originally contracted. It plans to bring two development aircraft to operational configuration and deliver those aircraft, along with 16 additional production aircraft (2 more than it originally planned to deliver in this timeframe), to the Air Force over the 6 months leading up to August 2017. Operational testing will be completed about 2 months after the aircraft are delivered. While this risks late discoveries of aircraft deficiencies, Boeing must correct them at its own cost. Figure 2 illustrates the original and current schedules for test and delivery.

Figure 2: Comparison of Original and Current KC-46 Tanker Aircraft Test and Delivery Schedules



Source: GAO analysis of KC-46 program data. | GAO-16-346

Note: The original schedule included delivery of the 4 development aircraft in operational configuration by May 2016. Under the current schedule the last of these aircraft will be delivered by November 2017.

In anticipation of the Air Force exercising its options for production lots 1 and 2, Boeing recently began building low-rate initial production aircraft

using its own resources.⁵ Boeing also plans to enhance its production capabilities by opening a second finishing center to militarize 767-2C aircraft and bring them to a KC-46 configuration. Assuming the Air Force exercises its options for production lots 1 and 2, program officials stated that Boeing may need an additional 4 months beyond August 2017 to deliver all 18 aircraft due to challenges it faces with its developmental test program.

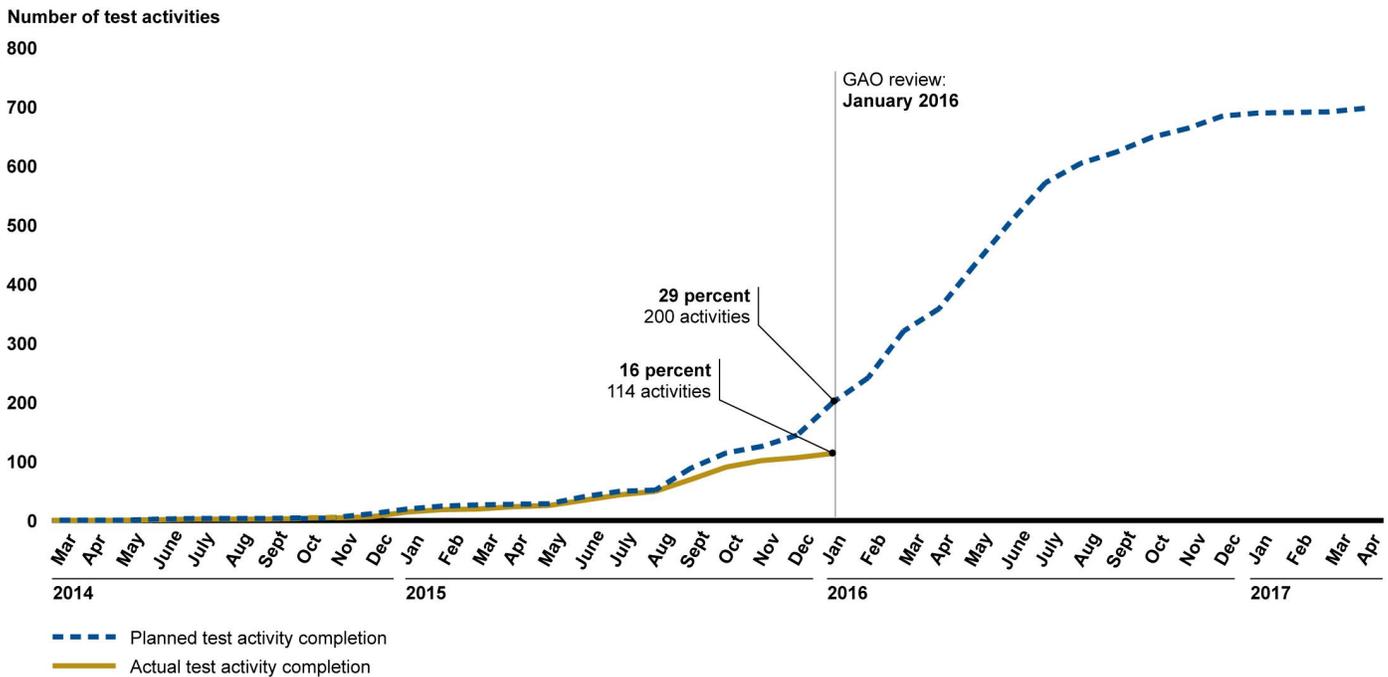
Boeing Faces Challenges Completing Revised Developmental Test Program

Boeing is about 2 years into its developmental test program to determine if the aircraft works as intended. The developmental test program contains about 700 ground and flight test activities to be completed over a 38-month period. At the end of January 2016, Boeing had completed 114 of the test activities. This included a demonstration of the aircraft's aerial refueling capability with an F-16 aircraft using the boom, which is needed to support the low-rate initial production decision. Boeing faces two primary challenges to completing its planned developmental test program. These challenges and actions Boeing is taking to address them are described below.

Complete optimistic test program: Since Boeing lost time addressing problems while developing the aircraft, it must now attain a high degree of test efficiency to adhere to the new schedule. Test efficiency refers to Boeing's ability to complete scheduled test activities on time. DOD developmental test officials believe that the schedule for completing the remaining test activities is risky because Boeing has not completed test activities at the rate it planned and upcoming tests will be more complex. In January 2016, for example, Boeing completed 7 of 55—13 percent—of the test activities that had been scheduled for that month because aircraft were in maintenance longer than expected, there were delays in completing earlier ground testing, and Boeing may have overestimated how much it could complete with two aircraft. Overall, as shown in figure 3, Boeing had planned to complete 29 percent of its total test activities through January 2016, but has completed 16 percent.

⁵The Air Force previously notified Boeing in October 2014 that it did not grant Boeing approval to start production because the production decision had not yet been made.

Figure 3: Progress Toward Completing Developmental Test Activities



Source: GAO analysis of KC-46 program data. | GAO-16-346

Boeing may also face difficulties achieving the test efficiency it needs to complete the remaining 84 percent of the test activities. For example, Boeing may have overestimated how many flight hours it can complete over the next several months because the last two development aircraft will begin flight testing later than expected due to production delays. Further, upcoming test activities will focus to a large extent on demonstrating KC-46 aerial refueling capabilities, which test officials consider to be more complex than the testing already completed. Finally, the company must still complete tests that were not performed in earlier months, which had not been factored into the latest test plans provided for our review.

To mitigate these risks, Boeing test officials told us that they are working to improve test efficiency. For example, testers are continually reviewing test plans to identify areas to reduce duplication or eliminate unproductive activities.

Obtain FAA approval of key components: FAA and program officials report that while most of the KC-46 components have been deemed ready for certification by the FAA, two key aerial refueling systems have not. In order to obtain airworthiness certification from the FAA, the KC-46

and its components must be designed, built, and then tested through the FAA's regulatory process. The supplier for the centerline drogue system and wing aerial refueling pods, however, built the systems without following FAA processes. Consequently, the supplier was told by the FAA in late 2014 that the FAA would need to inspect the individual parts to ensure design conformance. During this process, the supplier discovered a design flaw with the aerial refueling pods, which caused further delays. Originally, Boeing estimated that these components would be ready for the FAA to certify by February 2014, and it now projects that they will be ready by July 2017, over 3 years later.

To help mitigate schedule risk, Boeing obtained FAA approval in January 2016 to begin testing the KC-46 developmental aircraft without the two aerial refueling components being fully qualified. This will allow the program to proceed with most of the KC-46 certification testing. Once the remaining components have completed qualification testing, Boeing will need to conduct some additional testing to reach full airworthiness certification for the aircraft. The Air Force would then be able to conduct its review to determine that the aircraft and all its systems meet contract requirements and conform to the final design. However, because of these and earlier development delays, Boeing will not be able to complete development activities until June 2018, 5 months later than required. The Air Force and Boeing have agreed in principle to contract changes that reflect the delay. In exchange for extending the development aircraft delivery schedule, Boeing will provide, among other things, 4 production aircraft for operational testing and additional test infrastructure at Boeing Field to support a receiver aircraft needed for system specification verification and aerial refueling certification testing.

After Boeing completes the developmental flight test program, the Air Force will begin 5 ½ months of operational testing to determine if the KC-46 aircraft performs effectively and suitably in its operating environment.

Boeing has solved many of its early manufacturing problems and has taken steps to mitigate potential schedule risks. However, the company has a challenging road ahead in testing and delivering aircraft in a compressed amount of time, including possibly producing two more operational aircraft than it originally planned. If the Air Force exercises its options for production lots 1 and 2, any future delays may affect Boeing's ability to deliver all 18 operational aircraft by August 2017, but that risk is being measured in months rather than years.

Agency Comments

We are not making any recommendations in this report. We provided a draft of this report to the KC-46 program office for review and comment. The program office provided technical comments, which we incorporated into this report as appropriate.

We are sending copies of this report to the appropriate congressional committees; the Secretary of Defense; the Secretary of the Air Force; and the Director of the Office of Management and Budget. The report is also available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staffs have any questions concerning this report, please contact me at (202) 512-4841 or sullivanm@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix II.

A handwritten signature in black ink, appearing to read 'Michael J. Sullivan', with a stylized flourish at the end.

Michael J. Sullivan
Director
Acquisition and Sourcing Management

List of Committees

The Honorable John McCain
Chairman
The Honorable Jack Reed
Ranking Member
Committee on Armed Services
United States Senate

The Honorable Thad Cochran
Chairman
The Honorable Richard J. Durbin
Ranking Member
Subcommittee on Defense
Committee on Appropriations
United States Senate

The Honorable Mac Thornberry
Chairman
The Honorable Adam Smith
Ranking Member
Committee on Armed Services
House of Representatives

The Honorable Rodney Frelinghuysen
Chairman
The Honorable Pete Visclosky
Ranking Member
Subcommittee on Defense
Committee on Appropriations
House of Representatives

Appendix I: Status of KC-46 Technical Performance Capabilities

Technical performance measure	Description	Contract specification/Target	Projected to meet measure?
Operational empty weight	Maximum weight of the aircraft without usable fuel.	204,000 pounds	Yes
Fuel usage rate assessment	Gallons of fuel per hour used by the aircraft during a mission.	1,557 gallons per hour	Yes
Mission capable rate	Percentage of time aircraft performed at least one assigned mission.	92 percent	Yes
Fix rate	Percentage of time mechanical problems were fixed within 12 hours (after 50,000 fleet hours).	71 percent	Yes
Break rate	Percentage of breaks per sorties (after 50,000 fleet hours).	1.3 percent	Yes
Mission completion success probability	Probability of completing the aerial refueling mission and landing safely.	99 percent	Yes
Operational availability	Probability an aircraft will be ready for operational use when required.	89 percent	Yes

Source: GAO presentation of Air Force data. | GAO-16-346

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Michael J. Sullivan, (202) 512-4841 or sullivanm@gao.gov

Staff Acknowledgments

In addition to the contact named above, Cheryl Andrew, Assistant Director; Andrea Bivens; Kurt Gurka; Stephanie Gustafson; Kristine Hassinger; Katheryn Hubbell; Roxanna Sun; and Nate Vaught made key contributions to this report.

Appendix III: Accessible Data

Data Tables/Accessible Text

Accessible Text for Figure 1: Conversion of Boeing 767 into a KC-46 Aerial Refueling Tanker

767-200ER:

- Commercial passenger airplane
- Type certificate

767-2C provisioned freighter:

- Baseline non-military aircraft
- Enhanced flight deck
- Freighter (cargo door & floor)
- Refueling system and body tanks
- Tanker system provisions
- Amended type certificate

KC-46 tanker:

- Aerial refueling components
- Military avionics
- Supplemental type certificate
- Military certification

Source: GAO analysis of Boeing data (data); © Boeing (images). | GAO-16-346

Data Table for Figure 3: Progress Toward Completing Developmental Test Activities

	Month	Planned test activity completion	Actual test activity completion
2014	March	1	1
	April	1	1
	May	1	1
	June	3	2
	July	4	3
	August	4	3
	September	4	3
	October	5	4
	November	6	5
	December	12	7
2015	January	20	15
	February	25	19
	March	27	20
	April	28	24
	May	29	26
	June	41	35

Appendix III: Accessible Data

	July	50	44
	August	52	50
	September	89	70
	October	115	91
	November	126	102
	December	145	107
2016	January	200	114
	February	242	No data
	March	321	No data
	April	359	No data
	May	433	No data
	June	505	No data
	July	572	No data
	August	605	No data
	September	624	No data
	October	649	No data
	November	664	No data
	December	685	No data
	2017	January	690
February		691	No data
March		692	No data
April		698	No data

Related GAO Products

GAO, *KC-46 Tanker Aircraft: Key Aerial Refueling Capabilities Should Be Demonstrated Prior to the Production Decision*, [GAO-15-308](#) (Washington, D.C.: April 9, 2015).

GAO, *KC-46 Tanker Aircraft: Program Generally on Track, but Upcoming Schedule Remains Challenging*, [GAO-14-190](#) (Washington, D.C.: April 10, 2014).

GAO, *KC-46 Tanker Aircraft: Program Generally Stable but Improvements in Managing Schedule Are Needed*, [GAO-13-258](#) (Washington, D.C.: February 27, 2013).

GAO, *KC-46 Tanker Aircraft: Acquisition Plans Have Good Features but Contain Schedule Risk*, [GAO-12-366](#) (Washington, D.C.: March 26, 2012).

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