The Boeing KC-767 Tanker has surpassed 400 flight hours in its flight test program. The future Italian tanker completed its first phase of boom free-air stability testing and has begun fuel off-load testing on the ground.

# Ready to fill 'er up


BUZZ SHADDY PHOTO

## >> Inside

# Boeing set to meet U.S. Air Force's needs for tankers

U.S. warfighters rely on tankers to extend their reach around the world. U.S. Air Force Chief of Staff Gen. T. Michael Moseley highlighted that importance recently by identifying the critical missions enabled by aerial refueling. "The single point failure for everything we do—global strike, globalized air bridges, global mobility—is the jet tanker," Moseley said.

With the recent issue of a draft request for proposals for the Air Force's next-generation KC-X tanker, the stage is set for the service to move forward in replacing its existing fleet of more than 500 Eisenhower-era KC-135 Stratotankers.

As shown in this feature package, Boeing is ready to provide whatever capabilities are requested by the Air Force. This package examines what Boeing can offer to meet the Air Force's refueling needs. It also reports on the progress made by the KC-767 tanker team as it prepares refueling aircraft for Italy and Japan, and presents a look at some of the Boeing employees who work on the tanker program.

RON BOOKOUT PHOTO


**Mark McGraw, vice president of Tanker Programs for Boeing, said the tanker team aims to understand what the U.S. Air Force requires for its tanker needs—and provide a platform that will deliver the best technology to the customer and the best value to the taxpayer, while giving the U.S. government the lowest possible risk.**

# Fleet of 'global importance'

## Tanker VP McGraw: Plan is to 'help best solve needs' of U.S. Air Force

With the September issue of the U.S. Air Force's draft request for proposals (RFP) for the next-generation tanker aircraft, the competition to provide the Air Force with new tankers took a giant step forward. That's music to the ears of Mark McGraw, vice president of Tanker Programs, and the many Boeing employees supporting this program.

*Boeing Frontiers* recently spoke to McGraw and asked about what Boeing can offer to meet the Air Force's refueling needs, including a 777-based tanker. McGraw also gave an update on the progress of the tanker program, which includes 767 tankers being built for Italy and Japan.

### Q: What did you think of the draft RFP?

**A:** Obviously, we were very pleased to see the U.S. Air Force release the draft request for proposals, and happy to see that the process is moving forward. The global importance of the tanker fleet is demonstrated every day in Department of Defense operations. But the aircraft in our current fleet are on average more than 45

years old. I know the DOD and Congress understand the necessity to move forward with replacing these aircraft. It's been stated publicly by U.S. Air Force leadership that this is a high priority—even in these budget-constrained times.

Ultimately, we want to provide a platform that will deliver the best technology to our military customer and the best value to the taxpayer—and give the government the lowest possible risk.

### Q: What's next on the tanker contract timeline?

**A:** We had 21 days to respond to the draft RFP, which we have done. Based on statements from DOD senior leadership, we expect the final RFP to be released before the end of the year and a contract award to be announced in the summer of 2007.

### Q: Who's on the Global Tanker Team?

**A:** To build and deliver the safest, most reliable new tanker requires a team comprised of the world's best—from the platform to the aerial refueling components, engines, modification and ultimately product support. Our Global Tanker Team fits that description and includes not only our Boeing Commercial Airplanes colleagues, but also such well known names as GE, Honeywell, Pratt & Whitney, Aeronavali, Rockwell Collins, Smiths and Vought.

We have brought the best of the best to help us develop and build this tanker. Boeing has 75 years of aerial refueling expertise. We have supplied more than 95 percent of the world's aerial refueling aircraft with more than 1,900 tankers delivered to the world's military air forces. And we've invested $1 billion in developing next-generation tanker platforms.

### Q: Why did you recently make the Boeing 777 a tanker option?

**A:** In late September, we began discussing the KC-777 at the Air Force Association conference. This was not a publicity stunt. We wanted to provide a glimpse of what a true large tanker would look like and why it would make an incredible platform in the future.

### Q: What platform will you offer the Air Force, a 767 or 777 derivative?

**A:** First and foremost, we want to understand the needs of the Air Force customer. That knowledge will tell us how we can best provide the customer with low-risk solutions. It's important to understand those requirements and follow the internal process that will lead to offering the best possible platform for the U.S. Air Force.

Boeing believes the KC-767 is a great replacement for the KC-135. But if requirements change and the Air Force wants a larger tanker, we can fulfill that need with a KC-777 Tanker.

### Q: How long would it take to develop a 777 tanker?

**A:** Right now the 777 is just a concept. The development process would take about three years. However, much of the technologies and experiences of creating a tanker from a 767 would be applicable in the case of a KC-777. Also, the commercial freighter version of the 777 has matured in the past several years, and that also would decrease the developmental risk of converting the 777 to a tanker.

### Q: So the same technology would appear in both a 767 and 777 tanker?

**A:** That's correct. Our team will offer the most advanced refueling technology in the world today. The boom operator's station was developed with the boom operator in mind. The station is located near the flight deck and features a third-generation Remote Vision System that provides a 185-degree field of view and offers full control of air refueling. The fly-by-wire boom is fifth-generation; it's compatible with all U.S. Air Force receivers and offers the highest fuel transfer rates available. In addition, wing aerial refueling pod and centerline hose drum technology is all transferable.

• Meet some tanker teammates, and learn more about the tanker's refueling boom. Pages 16-17

### Q: How does the 777 compare to the 767 as a tanker?

**A:** The KC-767 offers more operational flexibility, while the KC-777 would be better suited for long-range strategic missions in which more cargo needs to be delivered. The KC-777 would be able to carry more than 350,000 pounds (160,000 kilograms) of fuel and offload more than 220,000 pounds (100,000 kg) of it on a mission of 500 nautical miles (900 kilometers). On the other hand, the KC-767 can lift off with more than 200,000 pounds (90,000 kg) of fuel and offload more than 130,000 pounds (60,000 kg) in a similar mission. The KC-777 could carry up to 37 pallets of cargo, compared to the 19 pallets for the KC-767. Again, the idea is to offer future customers alternatives and help best solve their needs.

### Q: How many KC-767 Tankers are you building?

**A:** We are currently under contract for four KC-767 Tankers for the Italian Air Force and four for the Japan Air Self-Defense Force. The first tanker for Italy is currently in flight test at our Wichita [Kan.] facility, and it's recently achieved several significant milestones. In September, the KC-767 surpassed 400 hours in its flight-test program and has completed the first phase of boom free-air-stability testing. During the tests, the crew of the KC-767 deployed the tanker's fifth-generation fly-by-wire boom, and the telescoping tube was extended for the first time in flight. To further demonstrate the tanker's boom stability in actual flight conditions, we then had a Boeing-built F-15 maneuver into a near-refueling position. So, we have now embarked on the aerial refueling portion of our flight-test program.

As for the Japan #1 Tanker, it's currently completing its modification work in Wichita. In late summer, our tanker employees activated power on the Japan #1 tanker, which signifies the end of the

### Boeing responds to tanker draft RFP

The U.S. Air Force on Sept. 25 issued its draft request for proposals for the next-generation tanker aircraft, now called the KC-X. The current plan is for the Air Force to issue its final RFP by year's end and select the winning platform by mid-2007.

Mark McGraw, Boeing vice president of Tanker Programs, said Boeing responded to the draft RFP within the allotted 21-day period. He added that Boeing expects the final RFP to be released before the end of 2006.

The first tranche is expected to replace hundreds of Eisenhower-era KC-135 Stratotankers at a rate of about 12 to 15 each year, with a value of around $20 billion.

BUZZ SHADDY PHOTO

**In late September, the KC-767 Tanker deployed its fly-by-wire boom for the first time during flight. The milestone demonstrates integration between the aircrew operator and the advanced refueling system.**

modification phase and the beginning of hangar operations. In late September, the crews began final clamp and routing, which is an inspection of the airplane's wire-bundle installation. During clamp and routing, the entire electrical system is checked to ensure proper wire separation and proper functioning of all systems prior to interior installation. Once hangar operations are completed, the aircraft will begin flight-line operations and ground testing in preparation for first flight later this fall.

There will be a delivery ceremony for the first KC-767 Japan Tanker in February 2007. We will follow that by delivering the first two Italian tankers in mid-2007.

### Q: Can you tell us something about the competition?

**A:** We recognize up front that this will be a tough competition. EADS/Airbus has partnered with Northrop Grumman, and we take their entry into this competition very, very seriously. But we are completely focused on listening to our Air Force customer and believe we will win by offering the best tanker solution for the warfighter.

### Q: If Boeing wins the U.S. Air Force Tanker contract, where will it be built?

**A:** Our position has been that Boeing will build its KC-X offering in Washington state, since that's where our commercial lines reside. Our company may have additional work performed on our tanker offering at other locations. ■

## At the heart of it all: 767, 777

To produce the world's newest and most advanced aerial refueling tanker ever built, it makes sense to start with great airplanes—in this case, the Boeing 767 and 777.

With proven performance and reliability, the 767 already is the most widely used commercial airplane on transatlantic routes. It boasts a 99 percent schedule reliability rate with low operating costs. In addition, the 767 tanker offers multiple interior configurations—passenger, freighter, convertible freighter or convertible combination—while maintaining its tanker capability.

Long-range and cargo capacity make the 777 the best tanker option for missions where maximum fuel offload and cargo/passenger capabilities are paramount. The 777 provides extended payload range, strong fuel offload performance and hauling capacity that exceeds 170,000 pounds (77,000 kilograms) of cargo. With its fuel-efficient design, it would excel at supporting global strike and aircraft deployment missions.

"Boeing Commercial Airplanes is a critical part of our global tanker team. By working together, we are offering customers a truly remarkable tanker," said Mark McGraw, Boeing vice president, Tanker Programs. "Throughout the current KC-767 Tanker modification and flight-test programs, our BCA partners have provided invaluable insight and expertise."

The combined BCA/Integrated Defense Systems team has undertaken several process initiatives that will help provide a fully provisioned airplane, he said. This process integration has been investigating such crucial areas as weight reduction and improved performance.

"Boeing has a superb team," McGraw added, "that will provide the safest, most reliable state-of-the-art tanker to U.S. service men and women."

# Who's on the roster

It takes a team of many talented individuals to make the Boeing tanker program a success. Here's a look at a few of these employees.

PETER GEORGE PHOTO

## Dave Ziegler

U.S. Air Force Capture Team Lead, Integrated Defense Systems

**Work site:** St. Louis

**Years at Boeing:** 26

**Role on program:** "Assure that we have the right customer messages, customer contacts, and a winning, customer-focused team that is creating the right offer for our U.S. Air Force customer."

**Best part about working on the tanker program:** "Our combined IDS and BCA team have the right solution, the right program and the right team to provide the Air Force with the next-generation tanker."

**Most memorable experience at Boeing:** Led the proposal team for the P-8A Poseidon. "The win was especially meaningful for the U.S. Navy and our team at Boeing."

GAIL HANUSA PHOTO

## Beverly Wyse

Vice president–program manager, 767 and Tanker, Commercial Airplanes

**Work site:** Everett, Wash.

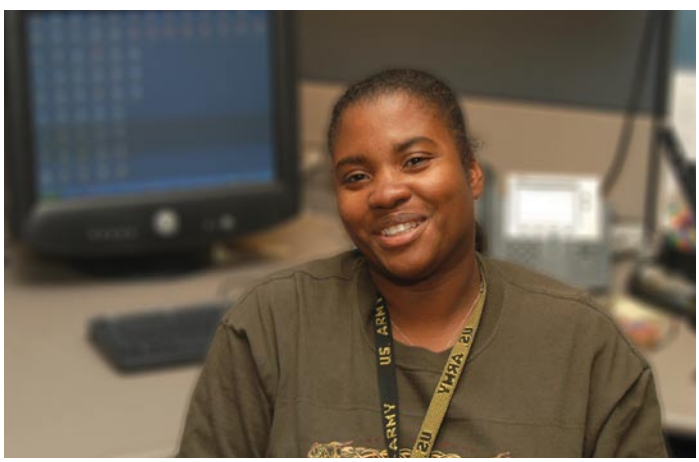
**Years at Boeing:** 18

**Role on the tanker program:** Leading BCA in supporting IDS' tanker program efforts

**Most memorable experience at Boeing:** Seeing the first flight of the 777

**Daily philosophy:** "I am a fan of Yoda (a character from the "Star Wars" movie series). A favorite saying of Yoda's is, 'Do or do not; there is no "try."' Yoda's message is one of conviction and raising the bar high, as well as committing 100 percent to whatever you do. That is critical in any team because we all depend on each other and must rely on each other to follow through. We will all have to reach high and *do*!"

TED WHITESIDE PHOTO



## Melissa Magee

Engineering, Integrated Defense Systems

**Work site:** Wichita, Kan.

**Years at Boeing:** 11

**Role on program:** Engineering technical analyst

**Best part about working on the tanker program:** "It's a new, developmental program, so we run into challenges that you wouldn't encounter every day on a more-established program. We have the opportunity to develop new processes that will be used throughout the tanker program."

TED WHITESIDE PHOTO

## Charles Scott

Sheet metal mechanic, Integrated Defense Systems

**Work site:** Wichita, Kan.

**Years at Boeing:** 18

**Role on program:** Working on the modification program for the first KC-767 Tanker that will be delivered to the Japan Air Self-Defense Force

**Best part about working on the tanker program:** "Working with a team that has a lot of knowledge and experience. Also, in the early 1990s I worked on the 767 41 section here in Wichita, so I'm familiar with the airplane."

**Most memorable experience at Boeing:** "Being able to work on so many diverse programs such as the 747 CRAF (civil reserve air force) program. And I was fortunate enough to spend nine months working in Seattle on the 767 and 777 in final join and install. It's all great experience that I can draw on every single day on the tanker program."

PETER GEORGE PHOTO

## Jeremy Levin

Contracts administrator, Integrated Defense Systems

**Work site:** St. Louis

**Years at Boeing:** 6

**Role on program:** Primary responsibilities are defining the terms and conditions of the prime contract with the Air Force and arranging IDS' purchase of commercial aircraft and development activities from BCA.

**Best part about working on the tanker program:** "The challenge of the competition, working with a great group of people and having the opportunity to help the company win such an important program."

**Daily philosophy:** "Get the work done, and try to have some fun in the process. It helps to keep a positive attitude and find ways to enjoy your day."

# Boom boom

## A peek at the world's most advanced refueling technology

By successfully flight-testing its fifth-generation KC-767 Tanker boom—the telescoping tube to be used to deliver fuel during flight from the tanker to military aircraft—Boeing last month began a new chapter in aerial-refueling history.

In a complex series of tests over Wichita, Kan., the test team deployed the fly-by-wire boom to several vertical and horizontal positions during flight and successfully demonstrated integration between the aircrew operator and the advanced refueling system. These were the first in a series of extensive air-refueling tests that will be conducted in upcoming months.

The fly-by-wire boom, which can transfer up to 900 gallons (3,400 liters) of fuel per minute, provides more precise and responsive controls to the operator, and automatically corrects its position to reduce the possibility of damage to receiver aircraft. With 2,600 fewer parts than earlier versions, the new boom is easier to maintain.

The evolutionary design also features a full-time Independent Disconnect System that improves safety by allowing the boom operator to disconnect from the receiver aircraft at any time.

"We've taken the proven aerodynamic shape and size of previous systems and made the KC-767 boom even more capable and reliable," said Mark McGraw, Boeing vice president for Tanker Programs.

Using a boom is the most common method for aerial refueling. Boeing has more than 75 years of experience in building aerial refueling tankers and has manufactured 99 percent of all aerial refueling booms in the world.

The KC-767 tanker also offers other ways of transferring fuel:

- The Centerline Hose Drum Unit (HDU). On the KC-767 a drogue, or basket, is trailed behind the tanker. Up to 600 gallons (2,300 liters) of fuel per minute can be transferred using this method. The KC-767 HDU's improved drag monitoring improves safety during hookups.
- Wing pods. A Wing Air Refueling Pod can be attached to the underside of each wing. These enable simultaneous refueling of two aircraft. Each pod can deliver up to 400 gallons (1,500 liters) of fuel per minute.

On the KC-767 Tanker, all refueling activity is conducted by the boom operator, situated at a computerized station located near the flight deck. Remote Vision System near-infrared cameras mounted near the air refueling boom provide the boom operator with a high-definition stereoscopic view of the receiver aircraft for refueling operations. Additional cameras provide a 180-degree wingtip-to-wingtip view covering the rear of the aircraft to allow monitoring of all refueling operations.

*—Doug Webb*