

The latest from the greatest

TANKER TRANSPORT

New tanker continues Boeing air-refueling heritage

By PAUL GUSE

One of the hidden heroes of global military operations is the air-refueling tanker. Behind each C-17 that dropped meals to Afghan citizens during Operation Enduring Freedom were two essential tanker sorties.

Although the deployment of six B-52s from the central United States to the Indian Ocean has become routine, the about 36 tankers required for each deployment are usually unseen.

There is a new player in the vital air-refueling arena, and it

comes from Boeing, the company with the most experience in tanker aircraft. Already the winner of two head-to-head competitions, the Boeing 767 Tanker Transport is proceeding down the development path. Deliveries should begin in 2005.

"The 767 Tanker Transport will set a new standard in terms of mission performance, flexibility and affordability," says Bob Gower, vice president of Tanker Programs, part of the Boeing Military Aerospace Support organization.

Boeing traces the 767 Tanker Transport's beginnings to about 1990, when the company realized an emerging worldwide market for new air-refueling aircraft.

"Most tankers in service today are based on the KC-135 and 707 airframes," Gower says.

"These 1950s-vintage aircraft are increasingly limited in their

ability to support the warfighter and increasingly costly to maintain and operate."

In response to this market opportunity, Boeing began looking at candidates to replace the aging tankers. "We looked at larger aircraft and smaller aircraft, and it was clear that the 767 was the right-size aircraft for the air-refueling mission," Gower says.

Because it is the right size, the 767 Tanker Transport can provide optimal fuel offload, a function of the range of the tanker aircraft and the amount of fuel it has to deliver to other aircraft. Smaller aircraft typically do not have adequate offload performance for most tanker missions, and larger aircraft bring with them larger infrastructure and operating costs.

The 767 Tanker Transport excels in mission availability,



The 767 Tanker Transport offers optimal fuel offload, making it the right-size platform for air refueling. The aircraft excels in mission availability, performance, flexibility and affordability. Because of Boeing's tanker expertise, the 767 Tanker Transport is a low-risk solution.

another key parameter for tanker aircraft. The more than 850 of the 767 aircraft in commercial airline service are dispatched daily at rates greater than 98 percent.

Perhaps the 767 Tanker Transport's greatest attribute, however, is the proven air-refueling expertise that comes with it. "Boeing clearly is the preeminent tanker company in the world," Gower says. "We bring our customers more than 50 years of air-refueling aircraft expertise, which results in mature, low-risk

tanker technology offered by no other company."

Boeing has delivered almost 2,000 tanker aircraft. It has produced virtually every air-refueling boom ever made. Boom-and-receptacle refueling, pioneered by Boeing in the late 1940s, is the Air Force's preferred method of aerial refueling. It offers the highest reliability and highest fuel-transfer rate. The Boeing boom technology has been upgraded continuously over the past five decades, as the company built upon the

success of the KC-135, KC-10 and international 707, KDC-10 and 747 tanker programs. The strength of these attributes was apparent last year, when the 767 Tanker Transport was selected over Airbus offerings in head-to-head competitions in Italy and Japan. These wins formally launched the company-funded design process, which is now in full swing.

Significant development work and funding has been invested in the program. That means the 767 Tanker Trans-

port will get to the flightline faster and more affordably than any other concept for a fully capable tanker.

Boeing is now in prime position to pursue the global market for tanker aircraft, estimated to be worth \$100 billion over the next 30 years. "We know we have the right product and the right team," Gower says. "I'm looking forward to delivering the first 767 Tanker Transport in 2005 and many, many more in subsequent years."

paul.m.guse@boeing.com

Decades of experience position Boeing as the leader in tankers

A solid air-refueling history

1929: A modified Boeing Model 95, known as the Hornet Shuttle, flew nonstop between Oakland, Calif., and New York City with the help of the first air-to-air refuelings conducted by the Boeing Airplane Company. Specially equipped Boeing-modified DH-4Bs and a Douglas C-1 provided the fuel.

1948: The first Boeing KB-29M tanker, a derivative of the B-29 Superfortress, was developed.

• Boeing developed the "flying boom." It proved to be the most reliable refueling method and had the highest fuel-transfer rate. The flying boom was later accepted throughout the U.S. Air Force as the preferred method of aerial refueling.

1949: Lucky Lady II, a B-50A modified to receive fuel through the looped-hose method, made the first nonstop round-the-world flight. The bomber flew 23,452 miles in 94 hours and one minute. It was refueled four times in flight by KB-29M hose tankers.

1950: The flying boom entered production on the Boeing KB-29P tanker.

1951: The first KC-97E flying boom tanker

KC-135 offloaded 49,000 pounds of fuel to eight receivers in 14 refuelings. The tanker crew was awarded the Mackay Trophy for the most meritorious flight of the year.

1975: The largest-ever tankers were produced when Boeing in Wichita modified three 747-100 aircraft with in-flight refueling booms and side cargo doors for the Iranian air force.

1976: The Air Force requested proposals for an advanced tanker/cargo aircraft based on an existing widebody commercial freighter. This led to development of the KC-10 Extender.

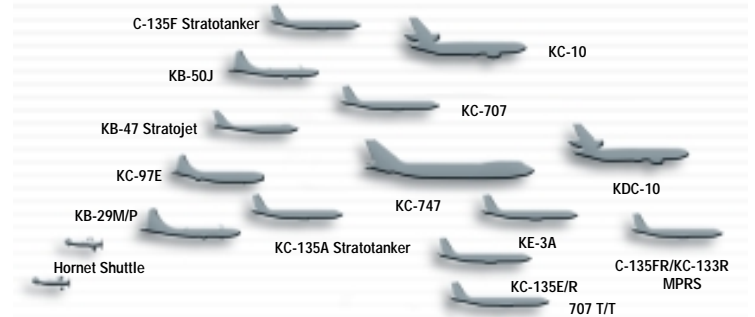
1978: The last KC-97L was retired, marking the end of propeller-driven tankers in Air Force service.

1980: The Air Force and Boeing began to re-engine KC-135As with fuel-efficient, highly reliable CFM 56 turbofans.

1981: The first KC-10A entered service. Sixty were produced for the Air Force.

1989: The Air Force published a statement of need for a replacement tanker aircraft, which led to studies that defined the Boeing 767 as

Tanker Chronology



Wichita: 'Tanker Town, U.S.A.'

Boeing in Wichita will continue its role as "Tanker Town, U.S.A." as the 767 Tanker Transport program moves forward. Late last month, Boeing announced its intention to use the Wichita, Kan., facility and work force for the potential conversion of 767 aircraft into tankers for the U.S. Air Force.

"Our Boeing teammates in Wichita have a long history of commitment and quality workmanship, including extensive expertise in modifying and supporting air-refueling tankers," says Jerry Daniels, president and CEO of Boeing Military Aircraft and Missile Systems. "We are committed to providing the Air Force and the American taxpayer with an affordable, low-risk, highly capable tanker to address the nation's vital air-refueling mission requirements," he says. "I know we have the right airplane and the right work force in Wichita to meet this challenge."

Wichita has been the center of Boeing air-refueling efforts for decades. Tanker modifications, air-refueling boom development, re-engine programs and other support efforts are performed there. It also has been home to the 767 Tanker Transport



Boeing in Wichita has a rich history and promising future in tankers. Here employees perform a re-engineing program on a KC-135R.

engineering and development program. The first 767 Tanker Transport modification, for the Italian Air Force, is expected to begin in mid-2003 at the Wichita Development and Modification Center.

The center has a considerable background in complex military-aircraft modifications. Employees have completed more than 445 KC-135 and RC-135 re-engineing efforts.

The Wichita facility has been home to 747 Airborne Laser modifications, VC-25/C-32/C-137 modifications and support, 767/E-3 AWACS modifications, B-52 upgrade and support programs, and several test-bed aircraft modifications.

Current, future 767 Tanker Transport programs

Customer: Italy

Number of aircraft: 4
Status: In a competition last summer, the Italian Air Force selected the 767 Tanker Transport to replace its aging fleet of 707 tankers. The contract is being finalized, and the first delivery is expected in 2005.

Customer: Japan

Number of aircraft: 4
Status: The Japan Air Self Defense Force, looking for new air-refueling capability, selected the 767 Tanker Transport in a competition. The contract is being finalized, and the first delivery is expected in 2006.

Potential customer: U.S. Air Force

Number of aircraft: To be determined
Status: Late last year, Congress granted the Air Force the authority to negotiate a lease for up to 100 767 Tankers as the first step in replacing its Eisenhower-era KC-135 fleet. Negotiations are expected to be completed this summer.

Potential customer: United Kingdom

Number of aircraft: 22 to 28
Status: Boeing is a part of Tanker & Transport Service Company Limited, a consortium that is competing for the Future Strategic Tanker Aircraft program. If awarded the contract in 2003, the consortium will acquire, modify and use Boeing 767 aircraft currently in the British Airways fleet for air-refueling services.

Potential customers

Australia is seeking five new tankers to replace its aging 707 aircraft. The United Arab Emirates is seeking three tankers to acquire an air-refueling capability. Other potential customers include Sweden, Norway, France, Korea and Israel.



was delivered to MacDill Air Force Base, Fla. That same year, the first aerial refueling in combat was performed when KB-29Ms refueled fighters and reconnaissance aircraft during the Korean conflict.

1953: Two groups of F-84s were refueled as they flew from the United States to French Morocco and the United Kingdom in the first nonstop transatlantic deployment of fighters. Also that year, the first KC-97G was delivered.

1955: The KB-50J made its first flight for the Tactical Air Command. A total of 136 hose-and-drogue tanker versions of the B-50 entered service.

1956: The KC-135 made its first flight. The last of 888 KC-97 tankers was delivered.

1957: The first KC-135 Stratotanker was delivered. The last KB-29 unit in the Strategic Air Command was deactivated.

1964: The first aerial refueling of the Vietnam War took place.

1967: During the war in Southeast Asia, a KC-135 on a routine support mission with four F-104s was called in to support Navy F-4s and KA-3 tankers. The KC-135 performed a three-level refueling: It filled a KA-3, which in turn refueled an F-4. Several Navy F-8s were supported by a second KA-3. In between, the KC-135 also serviced the orbiting F-104s. The

right-size tanker platform.

1990: The Air Force averaged 240 tanker missions a day during the Gulf War. The KC-135 flew more than 33,000 sorties, completing more than 78,000 refuelings and transferring 1 billion pounds of fuel.

1997: Boeing completed flight test of the KC-135 Multipoint Refueling System, which integrates wing-mounted hose-and-drogue refueling pods on the aircraft.

2000: Proximity trials at Naval Air Station Patuxent River, Md., proved the 767 to be the most stable platform for air refueling.

2001: The Boeing 767 Tanker Programs organization was formally established.

• The Italian Air Force became the 767 Tanker Program's launch customer when, after a competition, it selected the 767 Tanker Transport to replace its aging 707 tanker.

• Tanker & Transport Service Company Limited, a consortium consisting of Boeing, BAE Systems, Serco Group and Spectrum Capital, responded to the United Kingdom Ministry of Defense invitation to negotiate for the Future Strategic Tanker Aircraft program.

• Japan became the second customer for the 767 Tanker Transport when it selected the aircraft for its Japan Air Self Defense Force after a competition.