> **"We have a responsibility to work together to design, produce and introduce an airplane that exceeds the expectations of flight crews, cabin crews, and maintenance and support teams, and ultimately our passengers and shippers."** – *1990 agreement between Boeing and United Airlines that is the foundation of the 777 program*

PHOTO: Delivery of the first 777 to United Airlines took place at Seattle's Museum of Flight on May 15, 1995. Flying in the background is the first 777 built. **BOEING**

Family affair

The 777 celebrates two important anniversaries as Boeing aims to make the popular jetliner even better

By Debbie Heathers

Passengers flying over Africa on Ethiopian Airlines later this year may not realize that the 777-200LR (Long Range) Worldliner they are on—the airline's first—is the 900th Boeing-built 777; or that the long-range model, delivered nearly two decades after the program was launched, was in the plan from the very start.

The 777 program celebrates two milestones this month. The first—the 20th anniversary of the program's first order—took place Oct. 15, 1990, when United Airlines announced an order for 68 777s, which included 34 options. Days later, on Oct. 29, the Boeing board of directors launched the program with a ceremony that was broadcast live to multiple Boeing locations.

"This anniversary gives us the opportunity to realize how far we've come and how far we can take this great airplane," said Larry Loftis, 777 vice president and general manager. "The long-term aspirations our leaders had for the program clearly are being realized."

The program's founders envisioned a 777 family of airplanes from day one. It includes five passenger models and a freighter, which is the newest member and entered service in February 2009 with Air France Cargo.

Passenger models range from the initial 777-200, with a range of 5,240 nautical miles (9,700 kilometers), to the 777-200LR, with a range of 9,375 nautical miles (17,395 kilometers), which nearly doubles the range of its predecessor and

connects virtually any two cities in the world.

The top-selling and largest model, the 777-300ER (Extended Range), offers global airlines the opportunity to establish new routes with a full passenger load. Depending on the airline's configuration, the 777-300ER can transport more than 350 passengers in a three-class configuration up to 7,930 nautical miles (14,684 kilometers).

And the innovation hasn't stopped. Boeing engineers, looking for more ways to improve the 777, are exploring ideas that could reduce fuel burn and emissions, lower the airplane's weight, and increase its already extremely high reliability.

"Numerous studies are under way," said Nicole Piasecki, vice president of Business Development and Strategic Integration. "We are always challenging ourselves to make the No. 1 passenger-preferred airplane even better. We intend to remain the market leader and will continue to give airlines even more ways to compete successfully."

Teams of engineers are looking at advanced aerodynamics and new materials for the wings and leveraging 787 architecture and technology into the 777's flight deck and systems.

"Our customers tell us they need to customize the interior of the 777, so we are looking at additional ways to do that," Piasecki said. "We are investing in studies to improve passenger comfort and the cabin architecture using new materials."

Other studies focus on lowering operating costs, as well as improving the airplane's environmental profile. "Efficient design means low fuel consumption, less noise and cleaner emissions," she said.

Improvements over the years don't just include updates to the airplane. The production process was transformed into a moving production line over a six-year period from 2003 to 2009. Because of Lean+ initiatives and improvements, the original plan that allocated two factory bays to 777 manufacturing became unnecessary. Today, the program uses only one factory bay; 787 Dreamliner manufacturing occupies the remaining space.

All six 777 models are built on the same production line.

"It's not unusual to see a freighter, followed by a 777-300ER, then a 777-200LR in production," Loftis said. "Our production line allows us the flexibility we need in order to maintain competitiveness."

Today, it takes only 51 days from start to finish to build a 777.

"That's a reduction of 24 percent, and it is a tribute to employees embracing Lean," Loftis said. "The new culture that [former Boeing CEO] Frank Shrontz talked about at the program's launch event came true."

Shrontz, one of several speakers at the program's 1990 launch event, said at the time: "I've called the 777 the right product at the right time before, but I'd like to add one more thought to that description: The 777 provides us the unique opportunity not only to develop the right product at the right time but also to do it the right way. That's a significant opportunity for all of us."

Other airline revenue-producing ideas such as overhead crew and flight attendant rests, 330-minute ETOPS (extended operations), mood lighting, and premium interiors help the 777 to succeed in the marketplace. With 1,149 orders from 61 customers and 890 deliveries as of Sept. 20, the 777 remains highly regarded with airlines, passengers and pilots.

"Boeing started with a blank sheet of paper and said, 'Tell us what you want,'" Gordon McKenzie, then-manager of United's new technology engineering, told the *Seattle Post-Intelligencer* newspaper in 1990.

Boeing wanted input on the 777 from all of its customers, and a precedent-setting "working together" agreement was signed in United's Chicago headquarters boardroom by Jim Guyette, the airline's executive vice president for Operations, and two former Boeing executives, Richard Albrecht and Phil Condit.

The 64-word agreement (see top of Page 35) set out expectations for the two companies. "This agreement set the foundation for the program as we know it today," Loftis said. "The 777 is a proven performer, delivers exceptional value and repeatedly is at the top of operator and investor polls for its revenue-generating abilities." Other airlines later established similar working-together agreements.

And Boeing continues to incorporate new technology and innovations into the 777, he added, improving operating costs, airplane performance and—most important—the passenger experience. ∎

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777 by the numbers

- 24 million flight-hours
- 5 million takeoffs and landings
- 879 airplanes in service (851 passenger and 28 freighter)
- 99.3 percent reliability (passenger) and 99.4 (freighter)
- Range up to 9,395 nautical miles (17,395 kilometers)
- $865 billion (3,200 airplane) market opportunity over next 20 years

Source: Boeing Commercial Aviation Services, as of July

Honors and awards

- Voted best airplane by readers of *American Express Executive Traveler* magazine for 2008, 2009 and 2010
- Awarded Robert J. Collier Trophy in 1995 by the National Aeronautic Association
- Won top honors in the 2002 *Airfinance Journal* operators and investors poll
- Received industrial design awards for both the passenger cabin and flight deck from the Industrial Designers Society of America

Distance and speed records

- World record for distance traveled nonstop by a commercial jetliner of 11,664 nautical miles (21,601 kilometers) on a 777-200LR (Long Range) on Nov. 10, 2005
- Great Circle Distance without Landing record—the 777-200ER (Extended Range) flew from Boeing Field, Seattle, to Kuala Lumpur, Malaysia, covering 10,823 nautical miles (20,044 kilometers)
- Speed around the World, Eastbound record traveling the Seattle–Kuala Lumpur–Seattle route at an average speed of 553 mph (889 kph)
- National Aeronautic Association–certified speed records between Kiruna, Sweden, and Seattle; Bangkok and Seattle; Paris and Seattle; Frankfurt and Seattle; and Geneva and Seattle

PHOTO: After a record-setting nonstop flight of 11,664 nautical miles (21,601 kilometers) eastbound from Hong Kong to London that took nearly 24 hours, Boeing's new 777-200LR (Long Range) touches down at Heathrow Airport on Nov. 10, 2005. BOEING