

Rolling down the Dream Line

The largest building in the world produces some of the biggest planes in the world. Located in Everett, Washington, Boeing's 472 million cubic foot facility produces the 747, 767, 777, and now 787 family of commercial aircraft. While the plant has its own fire department, water treatment facility, and medical clinic, it gets its parts from over a thousand suppliers.¹ The Everett facility and its sister mega-structure in Renton, Washington produce planes whose parts are becoming increasingly outsourced as competition with other manufacturers grows.²

Boeing's long history of selling jetliners started with their first tri-engine jet, the Boeing 727 family, which entered service in the 1960s. This was not only the first profitable jetliner of the Boeing Company, but also the first successful jetliner of the Jet Age.³ As the Jet Age evolved, Boeing sought more advanced and efficient planes. The first Boeing 737 took flight in the late 60s and was a short-medium range twin engine jetliner. The Boeing 737 family has evolved over the years and was re-launched in 1997 as the Boeing 737 Next Generation. The Boeing 737 remains the most popular commercial aviation aircraft today with over 6,000 planes to have been delivered, which is more planes than Airbus' entire product line.⁴ For long range flying, Boeing manufactured the 747 jumbo jet, with four engines. Newer, more efficient planes that Boeing has produced for long range include the Boeing 767 and Boeing 777. Both are twin engine jets that have obtained the ability for long range flight through ETOPS, or "Extended-Range Twin-Engine Operational Performance Standards" which permits aircraft with two engines for travel over bodies of water, where an emergency landing site is not readily available.⁵ The Boeing 767 and 777 have become a popular replacement for the 747 as they are more efficient. The newest Boeing jet to enter service will be the Boeing 787, and will replace the 767 and 777 as a long range jet when it enters service. The Boeing 787 (also referred to as the Boeing 7E7) will be state-of-the-art with an advanced technological backbone and

“unmatched fuel efficiency.”⁶ The evolution of planes has also seen a massive change in production countries as economies have changed over the years. Most of the aircraft parts on the 727 were made in America, while almost all of the Boeing 787 parts are manufactured in Italy and Japan. The 767 and 777 are a mix between Japanese and American parts.⁷ This shows that as time increased, the number of airplane parts manufactured in the United States decreased, because parts were manufactured in different countries at lower expense to Boeing.

Boeing’s main competitor is Airbus Industries, a subsidiary of the European Aeronautical Defense and Space Company. They are involved in a price war as they are main competitors for orders by air carriers world wide.⁸ For example, US Airways, the 6th largest airline in the US, has plans to standardize their fleet to all Airbus, by retiring the 737 and replacing it with the Airbus A320, and replacing the 767 with the Airbus A350-XWB in 2013.⁹ In contrast to US Airways, Southwest Airlines flies a fleet of exclusively Boeing 737s. The Airbus A350 will be a Boeing 787 direct competitor by statistics. This competition has forced The Boeing Company and Airbus Industries to engage in price wars to keep the demand high.

As competition with airbus grows, Boeing is fighting for the Japanese market like never before. For the first time ever a Boeing aircraft’s wings are being built outside the US, in fact it is only the second time wings have been manufactured outside of Puget Sound.¹⁰ This new territory required a new approach, so Boeing took a page from Airbus' book and bought back four of its 747s to turn them into Dreamlifters. Dreamlifters are 747s that are modified in Taipei to the point where their cargo capacity is double that of a normal 747 freighter. Mike Bair, head of the 787 program, says that although ugly, without them Boeing would have to wait several weeks for their parts to arrive by sea, and buy their own ships because a standard shipping containers would be far too small..¹¹

In recent years, Boeing has increased outsourcing overseas. As a result, the 787 will see production in more countries then predecessors such as the 737 and 767. Boeing maintains

contractors in Washington, Australia, Canada, Nagoya Japan, Italy, Kansas, South Carolina, France, Sweden, and Connecticut. With Boeing's outsourcing to overseas contractors, local US based contractors feel the pain and are less profitable than before. Contractors who have worked on the Boeing 727 might have lost the contract for the 787 to overseas suppliers.

Over the years, Boeing has come from outsourcing 2% in 1960 to 30% in 1990 to what non-Boeing sources are calling 70% for today's Dreamliner (Boeing puts this number at 30%).¹²¹³¹⁴ Boeing's new method of delivering large sections from overseas aims to cut 787 assembly time from a month to three days, however it has also caused major delays. The companies that Boeing has contracted to do their work have outsourced to other companies. When the 787 was unveiled on July 8 2007 (7/8/7), the plane had more than 1000 temporary fasteners. "The Dreamliner's final-assembly process had been designed to bring together about 1,200 components. Instead, [Bair] said, the first airplane had come to the factory in 30,000 pieces."¹⁵ The "sixth Dreamliner will enter final assembly in early July, and it will be by far the most complete plane received from Boeing's partners."¹⁶

Boeing's great deal of problems could very well help Airbus, because Airbus is planning to produce the A350 in a similar manner. Fortunately for Boeing, Airbus' Beluga transporter is smaller than the Dreamliner, and will be unable to accommodate the A350.¹⁷¹⁸ Boeing expects the Dreamliner to take off later this year, with first delivery mid 2009.¹⁹ Despite the problems with assembly, Boeing plans to use this method in the future, while possibly excluding problem suppliers.²⁰ If all goes well, they can put away their scaffolding and the production lines of the 787 and beyond can become a moving walkway.

1 The Boeing Company, Major Production Facilities, <http://www.boeing.com/commercial/facilities/index.html> (accessed May 19, 2008).

2 David Pritchard and Alan MacPherson, "Boeing's Diffusion of Commercial Aircraft Design and Manufacturing Technology to Japan: Surrendering the US Aircraft Industry for Foreign Financial Support," CANADA – UNITED STATES TRADE CENTER OCCASIONAL PAPER #30 (2005),pg6.

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- 3 The Boeing Company, 727 Family, <http://boeing.com/commercial/727family/index.html> (accessed May 26, 2008).
 - 4 The Boeing Company, About the 737 Family, <http://boeing.com/commercial/737family/background.html> (accessed May 26, 2008).
 - 5 The Federal Aviation Administration, ETOPS Presentation, www.faa.gov/news/conferences_events/Pacific_aviation_2005/media/13%20ETOPS-MSpencer.ppt (accessed May 26, 2008).
 - 6 The Boeing Company, The 787 Family, <http://www.boeing.com/commercial/787family/background.html> (accessed May 26, 2008).
 - 7 Pritchard and MacPherson, Boeing's Diffusion of Commercial Aircraft Design and Manufacturing Technology to Japan: Surrendering the US Aircraft Industry for Foreign Financial Support, pg6.
 - 8 Jaime de Melo, "Notes on the Boeing-Airbus Rivalry," (2000).
 - 9 BBC News, "Airbus to launch Boeing 7E7 rival," BBC News, December 10, 2004, <http://news.bbc.co.uk/2/hi/business/4085631.stm> (accessed May 26, 2008).
 - 10 James Wallace, "Japanese will get key 7E7 work" SEATTLE POST-INTELLIGENCER, November 14, 2003, Business.
 - 11 Associated Press, "Chubby 'Dreamlifter' plays huge role in 787", MSNBC, <http://www.msnbc.msn.com/id/18741342>, (May 21, 2008).
 - 12 Jim Destefani, "A Look at Boeing's Outsourcing Strategy: Moving up the "value chain" -- and taking selected suppliers along for the ride" Manufacturing Engineering Vol. 132 No. 3 (2004), <http://www.sme.org/cgi-bin/find-articles.pl?&04mam001&ME&20040301&&SME&#article>.
 - 13 Pritchard and MacPherson, Boeing's Diffusion of Commercial Aircraft Design and Manufacturing Technology to Japan: Surrendering the US Aircraft Industry for Foreign Financial Support, pg3.
 - 14 Boeing, "Program Fact Sheet", Boeing, <http://www.boeing.com/commercial/787family/programfacts.html> (May 26, 2008).
 - 15 J. LYNN LUNSFORD, "JET BLUES Boeing Scrambles to Repair Problems With New Plane" Wall Street Journal, December 7, 2007, pg1.
 - 16 James Wallace, "Boeing touts 787 progress" SEATTLE POST-INTELLIGENCER, May 19, 2008, Business.
 - 17 Associated Press, Chubby 'Dreamlifter' plays huge role in 787.
 - 18 LUNSFORD, JET BLUES Boeing Scrambles to Repair Problems With New Plane, pg1.
 - 19 Boeing, "787 Dreamliner", Boeing, <http://www.boeing.com/commercial/787family/background.html> (May 26, 2008).
 - 20 LUNSFORD, JET BLUES Boeing Scrambles to Repair Problems With New Plane, pg1.