A380 Takes Flight

... and so do Boeing orders
Flight-testing program to address past delays

PIERRE SPARACO/TOULOUSE, FRANCE

The A380 is likely to be back in the air this week following an auspicious inaugural flight Apr. 27, with the test program expected to rapidly gain momentum.

However, the testing, scheduled to include up to five aircraft, must address delays accumulated in the past several months that are expected to present a slight speed bump on the road to certification. Entry into service with Singapore Airlines is now planned "in the second half of 2006," Airbus Chief Executive Noel Forgeard acknowledged. Previously, program officials asserted that first delivery would be in the second quarter of the year.

The A380 made a 3-hr, 54-min. first flight that was uneventful, according to Claude Lelaie, senior vice president of the flight division, and Jacques Rosay, chief test pilot, who were alternate pilots in command and shared responsibility for the flight, seconded by four test engineers. The aircraft's takeoff weight was 421 metric tons (926,200 lb.), well below its 560-metric-ton (1,232,000 lb.) maximum weight, and liftoff speed was about 150 kt. The A380 was accompanied by a chase aircraft, an SN601 Corvette twinjet. The six-seat business jet was produced in the 1970s by Aerospatiale, one of Airbus' predecessors.

Flying at 10,000 ft. or below and remaining relatively close to its southwest France home base, the crew retracted and extended the landing gear several times, extended flaps in three takeoff and landing configurations and explored large segments of the flight envelope. Said Rosay: "Within the first minutes of flight, we were impressed by the ease of handling. [It was] much like what we had experienced in the [full-flight] simulator."

Immediately prior to flight clearance, the aircraft completed engine runs, low- and high-speed taxi tests up to 120 kt., and simulated aborted takeoffs.

Although no noticeable difficulties or system failures were apparent during the first flight, a signal indicated that a main landing door was not fully closed. However, the chase aircraft's team could quickly determine that it was a false alarm, Rosay said.

The first A380, serial number 01, is powered by four 70,000-lb.-thrust Rolls-Royce Trent 900 turbofans, the engine type selected by Singapore Airlines, Qantas, Virgin Atlantic Airways, Lufthansa German Airlines and Malaysia Airlines. They ordered a combined 80 A380s. Airbus' other customers have not specified an engine type as yet. The alternative is the Engine Alliance's GP7200.
put through its paces. “This is the first time, since Concorde’s first flight in early 1969, that a commercial transport generated such a tremendous public interest,” a local resident noted. The flight, including air-to-air views transmitted from the chase aircraft, could also be viewed live, in downtown Toulouse, on a giant screen.

Former French President Valéry Giscard d’Estaing stressed that the promising A380 program “is a European, not French achievement.” In the same vein, Lagardère Group Chairman & CEO Arnaud Lagardère said: “A380 is Europe at its best.”

The aircraft is slated to obtain FAA/European Aviation Safety Agency certification after completing a 2,100-flight hour test program. The unusually high flight time will include nonmandatory route provings to confirm the A380’s overall reliability.

According to Peter Chandler, an Airbus test pilot and A380 deputy project director, the test program’s next steps will focus on achieving clearance of the basic flight envelope and investigation of the aircraft’s handling characteristics outside the “normal” flight envelope. At a later stage, fly-by-wire flight controls, autopilot and navigation systems will be tested. As the performance measurements wind down, they will be followed by hot and cold weather tests and cabin development.

MSN01, WHICH FLEW LAST WEEK, carries about 44,000 lb. of test instrumentation and water ballast tanks and is equipped with test engineer workstations on the main and upper decks. Its primary use in the next few months will be to advance performance testing and the systems’ overall behavior, an assignment it will share with MSN02, the second flight aircraft. The third A380 to fly will be MSN03, which will be outfitted by Airbus’ German branch with a cabin interior and used for early passenger flights. However, most route provings will be assigned to MSN07, the fourth aircraft to fly. MSN09 is dedicated to GP7200 certification flights.

Certification teams are confident the A380, a relatively conventional aircraft developed by General Electric and Pratt & Whitney. The Trent 900 obtained certification in October 2004 while the GP7200’s flight tests are scheduled to begin next September on a 747 testbed and will be followed by tests performed with the fifth A380.

Forgaard last week reiterated Airbus’ full confidence in the A380 program’s business case and long-term future. Fourteen carriers and the International Lease Finance Corp. signed orders and commitments covering 154 A380s, including 27 all-cargo aircraft. “We are actively negotiating with more potential customers and expect to conclude additional orders this year,” he said.

The A380’s first flight became a giant media event, and an estimated crowd of 50,000 onlookers joined the thousands of company workers at or near Toulouse-Blagnac airport to watch the aircraft get despite its unprecedented size, will not present any major difficulties, but the teams will, nevertheless, carefully monitor the static and fatigue tests being performed in Toulouse and in Hamburg. Also, authorities plan to scrutinize the results of emergency evacuation trials scheduled for the next few days. The ability to evacuate the aircraft in 90 sec. or less will be a condition of the A380 earning certification for its highest-density cabin configuration of 900-plus seats.

On Apr. 28, President Jacques Chirac made a last-minute decision to travel to Toulouse to congratulate the A380’s flight crew and the other Airbus employees. “This first flight is a milestone for Europe, a symbol of what Europeans can do when combining forces,” he said in an indication that the manufacturer can count on the government’s continuing support.
Combo Sales
Boeing increasingly displacing Airbus in mid-sized jet markets

MICHAEL MECHAM/SAN FRANCISCO

As Airbus glows with the first flight success of its impressively big A380, the fuel-efficiency and technology campaigns Boeing has mounted for its mid-sized jet families are scoring impressive sales.

Most attention is paid to the differences in size between their new wide-body aircraft. Airbus has concentrated its development money on a 555-seat double-decker to serve the world’s major hub airports. Boeing says the future is in bypassing congested hubs with long-range, point-to-point mid-sized jets.

But a significant divergence is emerging between them over technology. Both are committed to pushing new passenger conveniences, greater use of electrical systems and advanced aerodynamics. But Boeing has spent the past year emphasizing that improved engines, a lighter composite fuselage and wing and more fuel-efficient electrical systems will make the 787 20% more fuel-efficient than current-generation aircraft. Airbus has taken a more cautious approach, especially on whether composite technology is mature enough for fuselages (AW&ST, Aug. 2, 2004, p. 46).

Similarly, Boeing continues to push the efficiency of twin engine operations over four engines, especially in the new 777-300ER and -200LRs, which lowered fuel burn 2% below predicted levels with their General Electric GE90-115B engines.

Boeing has completed the exterior profile of the 787, opting for a more traditional horizontal stabilizer instead of the “shark-like swept image that first appeared. Note how dihedral the wings are (shown here in 1g flight loads). In cruise, they will bend more than any other wing, Boeing says.

Commitments by Air India and Air-India last week for firm orders of 67 777s and 787s, with an additional 79 options, offered evidence that Boeing’s sales campaign is working. Robert Milton, president and CEO of ACE Aviation Holdings, parent company of Air Canada, commented on the “overwhelmingly attractive economics” of the two families. He estimates the 787’s fuel and maintenance costs will be 30% lower than Air Canada’s 767s, which they are to replace, and said the new aircraft represented a “quantum leap” in technology (see p. 36).

Air-India was expected to split its order between Boeing and Airbus. But Director Jetliner Bhargava said Boeing won the whole contract on the basis of a “techno-economic study” that found it “the most suitable candidate.”

“We’re clearly seeing the fuel-price thing driving the decision making,” said Boeing Vice President Mike Bair, general manager of the 787 program. “I think it’s enormously important. It clearly improves the attractiveness of the airplanes.”

The 787 is expected to beat the A350 in an order for 15 aircraft from Northwest Airlines. The 787 succeeded in capturing the largest single order in China’s history—60 aircraft—and was selected by Korean Air, another Airbus A330 operator.

April marks two first-year anniversaries for Boeing: entry into service of its 777-300ER and launch of the 787. The Air Canada and Air-India choices tie Boeing’s marketing of the two families together more strongly than any previous commitment, although carriers such as All Nippon Airways and Japan Airlines have purchased the 787 to complement their 777 fleets in separate orders.

“When we started designing the 787 we looked at the capabilities of the 777 and designed it to complement the 777,” said Randy Tinseth, Boeing’s director of product and services marketing. Not counting Air-India’s intentions,
The contracts with Mitsubishi, Fuji, Koguchi, Voight and Aleinia will run more than an unprecedented 1,000 pages.

Air-Inda said it will take 2077-2079 with seven options, five 777-200LRs with three options and 10 777-300ERs with five options for a total of 35 firm orders and 15 options. The 777-300ERs will replace 747-200s and the 787s will replace Airbus A310.

It will be the carrier's first order for new aircraft in nearly 10 years. In the past, the government has taken so long to approve orders that Air-India and Indian Airlines, its domestic counterpart, have resorted to leasing.

Air-India officials expect approval by the parliament within a few months, but it could take a year or more, giving Air-India time to maneuver. It isn't giving up the sale.

As soon as the Boeing victory was announced, Air-India Vice President/Sales Nigil Harwood called for a revaluation and fresh tenders, saying the company was "amazed"-"that its rival had won.

"We were not given fair and equal treatment," he told the Press Trust of India. "We were not given a chance to make a presentation on the A350, where, as far as we know, the feature closed on 787, which will not fly before 2007. That goes contraries to the tender conditions." He says the tendered call for the aircraft to be available by 2006. That would mean neither the A350 nor the 787 could compete, leaving the field to the 767 or 330-200.

But a senior AI official who sought anonymity bluntly said the Airbus choice was too expensive to operate. "Who would look at a fuel-guzzling, 11-year-old A330 when compared to a new aircraft like the 787 to be introduced in the market three years from now?" he said.

Besides, the [European Union] norms on emissions and noise will soon rather than later become an issue, so why have an added burden?"

The stakes in India are huge for both Airbus and Boeing. "These are exciting times for the Indian aviation industry," said Kapil Kaushal, the India specialist for the Centre for Asia Pacific Aviation. "Over 325,000 additional seats are expected in 2005, up from 275,000 additional seats in 2005-06. He predicts passenger traffic to grow by at least 20% over the next five years, reaching to 50 million.

Competition in India's single-aisle market remains fierce. Boeing supplies Jet Airways, the largest private carrier, and Air Sahara, while new entrants Kingfisher Airlines and Air Deccan have gone with Airbus.

Neilan Mathews contributed to this report from New Delhi.

26 AVIATION WEEK & SPACE TECHNOLOGY/MAY 2, 2005