

# The 787 and the A350

# Teasing out

The economic downturn has worsened an already complicated situation for both Boeing and Airbus, whose 787 and A350 aircraft have been repeatedly delayed by technical and management problems. Yet spokesmen for both companies continue to voice optimism for the two planes, pointing to possible new orders that could offset recent cancellations, and even stating that apparent problems could hold hidden advantages. However, market analysts have their own take on what is really wrong with the two programs.



**Among the most difficult jobs in the world** today must be that of market forecast analyst for Boeing or Airbus.

Internal problems—from supply chain disruptions and labor issues to internal funding and resource conflicts to management shake-ups and design changes—would be enough to put any market plan into chaos. But the global economic crisis has brought a significant decline in air travel and flight schedules—as well as some bankruptcies—and an accompanying reassessment of planned new aircraft purchases has created a dark environment of doubt and concern.

“The A350 has made a nice leap from behind. The only thing that is a little worrying is half the order book comes from three carriers in the Middle East,” Teal Group vice president-analysis Richard Aboulafia tells *Aerospace America*. “And that area is not as bright as it once was.

“You’re used to seeing double-digit growth numbers, and now they have had their first drop [in Middle East traffic] in decades. And simultaneously the Dubai stock market has lost about 70% of its market. Property values have dropped as well, and oil is down to around \$40 a barrel [from a high of near \$150].”

# the facts



Professor Philip Lawrence, director of the Aerospace Research Centre at the University of the West of England, also sees significant problems for Boeing.

“The 787 delays, the problems with fasteners and brakes and software, a redesign on the wing due to an issue with lightning strikes and electromagnetic protection—it’s now two years behind schedule in service. It’s been incredible to see how bad that has been,” explains Lawrence. “At the same time, they have nearly 1,000 aircraft on the order book, and any new orders would not see delivery until 2020.”

Both Aboulafia and Lawrence share a significantly more critical view of prospects for both aircraft manufacturers than either expressed in previous interviews in 2007 and early 2008. Lawrence describes the order books for both the 787 Dreamliner and A350 as “fantasy,” while Aboulafia says, “in some respects, we have a race to the bottom.”

## A different take

Needless to say, Boeing and Airbus executives have a somewhat different perspective.

“The twin-aisle, twin-engine segment is about 6,700 airplanes in the next 20 years,

with a value of about \$1.5 trillion, so it is a huge market potential. The current backlog is about one-half of that,” says Randy Tinseth, marketing vice president for Boeing Commercial Airplanes (BCA).

“When you look at the backlogs we have of about 3,700 airplanes between Boeing and Airbus, I think the next couple of years won’t be about selling new airplanes but keeping that backlog in place. The challenge for the whole sales team, especially in 2009, will be to keep the orders we have now sold. And I think the management at Airbus agrees.”

Alan Pardoe, head of A330/340/350 marketing at Airbus Industrie, believes the European airframer’s biggest problems are behind it and the schedule ahead is well suited to meet whatever external pressures may impact the A350.

“We have a gradual phased build-up from first deliveries in 2013 to much more substantial numbers by 2016,” he says. “It would be

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almost impossible to judge if the world economy will be soft for such a long time. And we are talking relatively small numbers of aircraft when we start production.

"We actually have faced much stronger demand than we could produce airplanes for, so even if there were problems, we only would find ourselves unable to fill demand we couldn't have filled anyway. Our competitor is in a much more vulnerable position, having to deliver aircraft in the next year."

### Hidden advantages?

Boeing's earlier delivery schedule has been cited as an advantage—even should the 787 experience additional delays measured in years rather than months, it will be flying long before the first A350 is delivered.

Pardoe has a rather different take, even finding an advantage in the rough start the A350 experienced, with the first design canceled and replaced by a complete rework.

*"If you look at the current order book and lead times on both aircraft, I don't think we know what it will be like in five years; frankly, I think these order books, with about 1,400 combined, are pretty much fantasy."*

**Philip Lawrence, director  
Aerospace Research Centre,  
University of the West of England**

"It is a rarity in this business for any manufacturer to have the luxury to start with a clean sheet of paper, which allows you to exploit all advantages in materials, design techniques, and tools and technology to bundle together improvements in operations. We also have an advantage in this particular case of a five-year gap between the launch of the 787 and the A350, giving us a good oversight as to what our competitor's line-up is," he says, and then expands the scope of the competition.

"I know we talk 787/350 as the natural pairing, but in our case we also have the A330. Since Boeing launched, we have sold about 550 additional A330 models, aircraft deliverable from now through 2013 and beyond. So those are filling the near-term void until the A350 comes on stream. Even then, the A330 will continue to do some things well the bigger aircraft is not seeking to do.

"The smallest A350 will be a bigger seat count than the A330 and is designed as a long-range aircraft, while the A330 has carved a meaningful part of the market as a regional aircraft, flying from one to six hours in re-

gional markets. Those will continue to do a good job alongside the A350 as they arrive. So the A350 does not benefit directly from any delays in the 787, but the A330 does."

### The Boeing benefit

Boeing, meanwhile, sees that same scenario as beneficial to their program.

"For the past year, we haven't just been sitting on our hands waiting for the A350 to be defined, we've also been talking to our customers about what they want," Tinseth says. "When we really understand the capabilities of the A350, we will have done the right groundwork to prepare ourselves to put the next step of our plan into action.

"The A350 is an interesting beast. The smallest version, the -800, actually competes with the 787-9, our bigger member, while the larger A350s actually compete with the 777. So in many ways, it is really competing against the whole Boeing twin-aisle, twin-engine family. And when you look at the biggest member of the 777 down to the smallest 787, we have a wider market appeal and an efficiency advantage over the A350 at the 787 level. The A350 may have a fuel advantage over the 777, but we have the advantage in range and capacity, even, frankly, passenger comfort," he adds.

Tinseth also sees little reality in Pardoe's belief that current Airbus offerings can fill the competitive gap pending arrival of the A350.

"The A330 will go by the wayside, and you could make an argument the A340 already is dead, so the A350 is their entry into a really large market, a market we've been saying is large for a long time—and it now appears Airbus believes us," he argues.

"When you look at the 777 versus the A350, depending on the model, we've had a two- or three-year advantage in time-to-market. And we have five models across this range, which Airbus is trying to cover with three models, so they have to compromise where we don't."

Boeing has committed to three members of the 787 family—the -8, which will enter service in the first quarter of 2010; the -9, a 6.1-m extension of the -8 for delivery around 2012; and the -3, a regional version of the -8 for travel primarily within Japan, for which no delivery schedule has been set.

"We also continue to look at a fourth version, the -10, which probably would be another stretch of the -9, but we need to finalize our -9 first before determining whether to go forward with it," Tinseth adds.

### Cancellations, deferrals... and orders

The opening weeks of this year were rough on Boeing, with 32 cancellations on the 787 through mid-March—15 in January from Russia's S7 Group and 16 more in February from Dubai-based leasing company LCAL, plus a private VIP order from a wealthy Hong Kong real estate developer.

"The postponement of the revenue stream from projected aircraft leases contributed to our investors' decision to cancel," an LCAL spokesman told the *Wall Street Journal*, without elaboration.

In March, Delta Air Lines indicated it might not take all 18 787s previously ordered by Northwest Airlines, which was absorbed by Delta in late 2008. Northwest was to have been the first U.S.-based 787 operator.

"We have excluded from [the report] our order for 18 B-787-8 aircraft," Delta said in a filing with the Securities and Exchange Commission in March of this year. "The Boeing Company has informed us that Boeing will be unable to meet the contractual delivery schedule for these aircraft. We are in discussions with Boeing regarding this situation."

However, Delta did report an additional 18 Northwest options for the 787 and by mid-March had not officially canceled any orders. And Delta Chief Executive Richard Anderson previously was quoted in Seattle newspapers as expecting that it ultimately will add 787s to its fleet, perhaps a great many.

The first really good news for Boeing came in mid-April, when Gulf Air, the national carrier of Bahrain, exercised eight options included in its original buy of 16 Dreamliners in January 2008. The actual value of turning those options into orders was not announced. While the 787 has a list price of \$162.5 million each, standard and possibly additional discounts no doubt substantially reduced prices.

At a February conference of Barclays Capital investors, BCA president and CEO Scott Carson acknowledged the aerospace giant is prepared to cut production rates if the economy further derails customer orders.

"We have seen a lot of activity in terms of people wanting to defer aircraft," he said, adding most such actions have only involved "a couple of fiscal periods." He noted that Boeing has been able to fill those production slots with aircraft delayed by the 2008 machinists union strike, and with others that previous production plans had not allowed Boeing to schedule as early as some customers had wanted.

Carson also rejected predictions by one



*Delivery delays of some 777s caused by a strike angered several Boeing customers.*

of Boeing's largest customers, International Lease Finance (ILFC), that production cuts could be as large as 35% through 2010—although ILFC CEO Steven Udvar-Hazy was equally pessimistic about Airbus, predicting both companies would deliver fewer aircraft in 2010 than in 2009.

"My guess is closer to 10%, if we have to," he told the investors' conference. "We're engaging with our customers on a weekly and daily basis to ascertain where they stand"—and the company is willing to put up as much as \$1 billion of its own money to help customers with financing in the short term.

At a 777 delivery ceremony in Seattle two days before the Barclays conference, Udvar-Hazy had been unusually blunt about his assessment of Boeing's future with the 787.

"Airlines are focused on survival. Ordering new airplanes is not the flavor of the month," he told reporters, adding both companies had lost considerable credibility in 2008, when each had a series of setbacks and delays despite previous assurances that their problems had been resolved. "You can't deal with companies that are unreliable."

Sir Richard Branson, chairman of the U.K.-based Virgin Blue group of airlines, who was obviously angered by the late delivery of the 777, missing the holiday season launch of his new Australian unit, handed Boeing an even darker message.

"It was a horrible mess that Boeing was on strike. We messed up tens of thousands of passengers over Christmas," he said. "We had to buy tickets on other airlines and scramble to get seats which weren't available. The financial damage in an industry where the margins are minute is catastrophic.

"We're already thinking there's another lot of planes we want to order. Do we give it to Boeing or should we go to Airbus, which does not go on strike? We have a choice. Do we have to come back to Boeing? If there's a danger of ever having another strike, we won't."

Despite the year-opening cancellations,

*The A350 is scheduled to deliver the first airplanes in mid-2013; start-up of construction for the final assembly line in Toulouse was marked by a symbolic groundbreaking with Airbus officials in January.*



Boeing still had 879 firm orders from 58 customers, while Airbus reported 478 orders from 29 customers for the A350. Both have full production schedules for the first few years of each program. Despite the cancellations, any airline ordering a 787 today would have to wait until nearly 2020; even new positions for the 777 are not available until the mid-teens.

Although only half the Boeing tally, Pardoe says, the Airbus number actually represented a higher rate of A350 sales than Boeing had on the 787 at a comparable point.

“The A350 is on course to deliver the first airplanes in mid-2013, the 350-900 model; the -800, the smallest in the family, in mid-2014; and the higher capacity -1000 toward the end of 2015,” he says. “The running order is determined by the marketplace; they want to meet the medium-size aircraft demand first.



*Boeing officials say that the 787 production issues are now behind them.*

“Leaping over what’s happening this year, which is exceptional in global economic terms, and looking at the market by 2013, most believe the economy should be back on track. In which case we should be back on track for a 4-5% annual average growth, and the bigger airlines are looking to roll their existing aircraft into something new, which would translate to strong demand for the -900.”

### Rebuilding credibility

To their credit, however, both Tinseth and Pardoe acknowledge their respective companies are coming off two years of program hits, delays, uncertainty, and deteriorating customer relations, as reflected by Udvar-Hazy’s and Branson’s remarks.

“Clearly, these delays and difficulties really have a negative impact on your credibility, not only with customers but also suppliers and other constituencies. We have to take steps right now to build back that credibility, which won’t happen overnight,” Tinseth says. “So we have to stay close to our customers and understand their needs.

“As a company, we must execute our existing programs, such as the 777, to make sure they deliver on time and with high quality. We have to remain more productive and maintain a strong balance sheet. And we have to be laser-focused in delivering on these production programs. That will take time; you have to demonstrate you are making progress to get that credibility back.”

Which includes taking a serious look at lessons learned—and proving they have, in fact, been learned.

"It is clear on the 787 we made some mistakes, clearly in terms of oversight. Things were happening we didn't really understand, so we have reassigned those and put Boeing assets on the ground, and now those suppliers are making significant headway. We also have learned some real lessons for future programs," Tinseth says.

"We'll have to take a really hard look at our relationships, what kind of things we outsource, and the capability of those suppliers. We are doing our best to work with our current suppliers to fix the problems we have today and will have to take a fresh look to avoid those problems in the future. For the 787-9, we've already announced we will do more of that engineering work in-house."

Pardoe was somewhat more succinct: "We have learned lessons and also have a very, very strong management team running the A350 program, well aware of the pressures on them. And everything I have seen so far reassures me they will deliver the airplane on time and on target."

### What the analysts say

The analysts remain unconvinced, seeing different problems facing each program and company.

"I don't think it is customer doubt—that would show up in a lack of orders—nor how the companies are run," Aboulafia says. "With the 787, it is technology and production method; with the A350, it is a resource issue.

"Airbus' biggest issue is a vulnerable capital base and limited engineering resources. Their biggest problems go back to blowing \$20 billion on a marginal product—the A380. They should not be outsourcing as they are, copying Boeing, but they do not have adequate capital resources to keep it all in-house, largely due to what they have put into the A380. The crunch they face from the economic downturn is going to impact their development. They are spending about 9% of sales on development, which is really high, and will have to increase that if revenues turn down. There is not a lot of margin for error for Airbus.

"For the 787, by contrast, the technology is slow to mature, extremely challenging, and the production method is somewhere between very challenging and, in some ways, a mistake. Manufacturing outsourcing works great, but there are clear limits to engineering outsourcing. Trusting industrial partners to do a much greater percentage of design and integration work is clearly a mistake, which is



*Analysts say production woes negatively impacted the A380 program.*

why they are having to parachute people in to take greater control. At this stage, you can start bringing in more people—the Boeing in-house engineering departments are more intact, they just have to be reinforced. They also have more money, which gets back to return on investment."

Lawrence believes only time will tell which program—if either or both—ultimately delivers the stability, customer satisfaction, and ROI both companies need.

"It's still relatively early days for the A350, and all looks fairly good at the moment, but normally programs do look good at this kind of milestone," he says. "They had a target of getting the design definition frozen by the end of last year, and they did. But Airbus seems to really struggle in the last part of the process, where a program has to be industrialized and you gear up to production; they really messed that up on the A380.

"Airbus was hit hard with compensation due to delays already, and Boeing will be as well. Qantas, in particular, seems pretty unhappy, because the 787 delays are impacting their whole fleet renewal plans. The 787 is really a strange story. It was about 80% outsourced, and if you look at some of the companies Boeing linked itself to, that is bound to give you many problems.

"Some American analysts are talking about some 70% of both order books being subject to deferrals, and suggesting both companies should be reducing their production plans—for Airbus, because a lot of their buyers may not be able to get the financing they need to do the deals. In fact, this industry lags a bit behind the rest of the economy in reacting to changes, and it should be interesting to see what happens when it does." **A**