

Delays add to pressure on leaders

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In June 1944, as the invasion of Normandy was under way, the **Boeing** aircraft plant in Seattle was turning out 16 B-17 bombers every 24 hours.

Sixty-five years later, Boeing is struggling to get even one of its new 787 Dreamliner aircraft into the air more than two years after first putting one together.

No one expects any modern company to match wartime production. But what is striking about the Boeing delays is their length, and the fact that similar problems have struck the world's other leading aircraft maker, Europe's Airbus.

Its A400M military transport aircraft is running four years late. It is now due to make a maiden flight before year's end, as is Boeing's 787. Airbus's A380 super-jumbo was also held up for two years before finally entering service in 2007.

The experience has been jolting for the companies and their customers.

"This is the worst I've seen in 27 years," says Richard Aboulafia, vice-president of analysis at the Teal Group aerospace consultancy in Virginia.

"I can't remember such a confluence of problems," says Professor Jeffrey Jupp, formerly one of Airbus's most senior engineers and now a visiting professor at Bath University.

The delays have come as the commercial aviation sector suffers a severe cyclical downturn, but they raise a more long-term structural question: will the world's two biggest aircraft makers ever be able to produce new aircraft on time again?

Mr Aboulafia argues that one theme links the hold-ups: they are happening at companies increasingly run by people who think they can short-change engineering resources in order to maximise returns.

It is no accident, he says, that large advances in science, such as the moonwalk, Concorde and the 747 jumbo jet, happened in the 1960s and 1970s when a Cold War culture of government funding prevailed, rather than today's market-led environment.

Others find it more difficult to see a common theme in the delays, however. "I think it's more of a coincidence," says Tim Clark, president of Dubai-based Emirates, Airbus's biggest A380 customer having ordered 58 of the aircraft.

The A400M's problems, he says, are largely to do with propulsion, a reference to the powerful turboprop engines that Airbus's parent company **EADS** - European Aeronautic Defence and Space - has cited as a cause for the aircraft's delay, to the irritation of the engine makers.

The delays in the A380, the world's largest passenger aircraft, have attracted a different set of explanations.

An aircraft of its size and complexity would have tested any organisation, let alone one with the political dynamics of EADS and Airbus, which resulted in complicated work-sharing arrangements around the European continent.

The fact that software used in the design and manufacture of the A380 at Airbus's Hamburg engineering site turned out to be incompatible with that being used at the group's Toulouse headquarters in France was only part of the problem.

Political tensions underscored the endeavour, says Andrew Walker, professor of aerospace composites at the University of Manchester, and previously chief manufacturing engineer for the A380 wings, which are made in the UK.

"The British used to hate the Germans and we used to hate the French and there were always huge technical problems on the A380 on every part of the airplane build," he says. "No nation would tell another nation what was going on because we were always waiting for someone else to declare that they were the critical failure point."

When Boeing came to make the 787 Dreamliner, it adopted a plan that shared some of the characteristics of the European model.

The US manufacturer abandoned its normal practice of designing and building in-house in favour of outsourcing production to suppliers around the world, sharing expense and risk. But as Boeing has admitted in recent months, the system had flaws. Quality control suffered. Components that were supposed to be sent to Seattle fully fitted arrived unfinished.

"In some cases we asked partners to do some things they were not technically or financially able to do when you look back with 20/20 hindsight," Jim McNerney, Boeing's president and chief executive, told analysts in early September.

The company made big changes around this time. It has retaken control from some suppliers, even buying one outright. Scott Carson, the head of Boeing's commercial aircraft division, is being replaced by Jim Albaugh, head of the group's military unit.

They've been brutally honest about what went wrong, says Professor Keith Hayward, head of research at the Royal Aeronautical Society. People have been moved and resources have been thrown at getting the programme back on schedule.

But as Prof Hayward points out, there is another reason for the 787's delay: this is the first passenger aircraft made mainly from plastic composites. They are stronger than traditional aluminium, but more importantly for the airlines that pressed manufacturers to make more fuel-efficient aircraft as oil prices began to soar, they are much lighter and should allow fuel costs to be cut significantly.

Composites are also a hugely disruptive technology, says Prof Walker. A traditional aluminium aircraft factory is a blue-collar workplace, he says, while a composites factory is run by engineers with a different set of skills.

A composites factory is completely different. It is fully automated, it is clean, you can't smell any drilling.

In other words, making a new generation of composite aircraft means ditching decades-old production equipment, materials and people.

For all this, Neil Hampson, head of PwC's global aerospace and defence team, says the attitude Boeing and Airbus have taken to each other's woes has been notable. Both companies have been quite gentlemanly about the delays. They haven't made much of them, he says.

This is probably because each understands the difficulties the other faces.

Airbus, for example, is making its own composite aircraft, the A350 XWB, and is watching the 787 closely.

But the delays have raised questions about whether smaller aircraft makers such as Brazil's **Embraer** or Canada's **Bombardier** could one day replace the big two. Or perhaps even manufacturers in China or Russia.

They have to be very carefully watched, says Prof Jupp. He gives yet another reason why the majors have to tidy up their act.

Eddy Pieniazek of the Ascend aviation consultancy says the delays are double-edged.

It is a sobering thought that, had both manufacturers delivered the B787 and A380 in accordance with the delivery schedules that were envisaged in early 2005, we would have an additional 190-200 such aircraft in service by the end of 2009, he says. That would have compounded the overcapacity issue, unlike the 25 or so A380s that will have been delivered by the end of 2009.

Maybe their eventual arrival in numbers will be better timed with the recovery that is anticipated from 2011 onwards.

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