

## INDUSTRY

## Changing circumstances

PAUL LEWIS / SÃO JOSÉ DOS CAMPOS

In the four years since Embraer unveiled the 170/190 as its new large regional jet of the future, the regional air transport industry has changed out of all recognition. In the wake of 11 September, the number of regional jet manufacturers has been halved from four to two, and a roll-back of scope clause restrictions is defining the relationship between regional and mainline operators.

This has presented Embraer with both opportunities and challenges in trying to keep the 170/190 programme one step ahead of a rapidly transforming market. "Today's 170 is quite different from the 170 we first idealised in 1999," says Fred Curado, Embraer executive vice-president airline market. "We spoke to some 50 airlines before launching the programme and yet few of them will ever fly the 170. Most of the operators who will fly the aircraft we only spoke to after the launch."

The Brazilian manufacturer now identifies two distinct markets for the new aircraft. There are airlines, predominantly in Europe, that have no restrictions between mainline and regional and could operate the entire 70- to 118-seat series. And then there are a growing number of airlines, led by US Airways, which, thanks to new labour agreements, will for the first time be able to operate the 170/175 regionally, but for now a 190/195-size jet remains a mainline preserve.

Embraer accordingly has tried to

distance the aircraft from the label "regional jet", which it considers to be for 60-seaters and smaller, first by dropping the original ERJ prefix designation and more recently by promoting the family as "E Jets". "They are economical, ergonomic, environmental and finally Embraers, and while they are not mainline narrowbodies, they're certainly not regional jets," says Curado.

The company's plan for a return on its \$850 million investment in the programme rests primarily on winning market leadership in the 70-seat category with the 170/175. It is also promoting the 190/195 to mainline airlines and, interestingly, new low-cost carriers, as a cheaper, more efficient 98- to 118-seat alternative to the Airbus A320 and Boeing Next Generation 737. "If you look at the A318 or 737-600, we can certainly equal, if not beat them, with lower cost per trip," says Curado.

Embraer's orderbook stands at 73 170s and 15 195s, plus 216 options. General Electric Capital accounts for 50 of the 70-seaters, many of which are likely to end up with US Airways' new MidAtlantic Express subsidiary. Alitalia has ordered six for delivery this year, Swiss under a renegotiated deal has halved its order to 15 170s and similar number of 195s, with deliveries pushed back to next year and 2006 respectively, and Air Caribe will take its two 70-seaters in 2005.

new tool will be the central maintenance computer (CMC), to which data can be downloaded on the ground or in the air using the ACARS datalink system. The CMC, in turn, will instruct a maintainer's laptop on the problem and even provide a link to a relevant electronic manual.

Embraer has invested about \$50 million in new infrastructure to support the 170 programme. This ranges from \$3 million spent on a three-dimensional virtual prototyping centre to simulate man-machine interface processes and conduct semi-immersive design analysis, and up to \$15 million to buy seven production docks. Additional funds have gone into shared facilities, such the opening of the Gaviao Peixoto test centre 300km north-west of Sao Paulo, complete with a 5km runway, and a \$12 million paint shop at Embraer's main Sao Jose dos Campos plant.

The assembly docks are housed back-to-

back in a new 16,000m<sup>2</sup> (172,000ft<sup>2</sup>) hangar that will be capable of turning out up to seven aircraft a month. Embraer looked at a number of options, such as a flow and moving line, but its experience with the Legacy corporate jet having to be pulled off the ERJ-135/145 production line for rework and customisation, pointed to a dock solution. "If you have different products on the same line, it doesn't work well," says Yokota. "We have four aircraft with different-sized fuselages and wing, and we can't expect a 170 to take the same time as a 195, so for that reason we have gone for a dock system."

Work is divided between Embraer and 16 partners around the world. France's Latecoere ships to Brazil a common forward and aft fuselage barrel for all four versions, while Embraer has responsibility for the nose section, centre fuselage, wing-to-fuselage fairing and the different-sized

fuselage plugs for the 175, 190 and 195 versions. Spain's Gamesa supplies the empennage for the 170/175, and the wing is assembled by Embraer using leading and trailing edge components supplied by Kawasaki Heavy Industries (KHI) of Japan.

Embraer has been encouraging its partners to establish a local presence to bolster local content on the new aircraft, with the goal of having at least 50% of the jet by value produced in Brazil. Wing panel and slats supplier Sonaca already has a local entity in the form of its Sobraer partnership with Embraer, and GE already does some engine dressing work at its local GE Celma operation and is thinking of moving to Sao Jose dos Campos. KHI last month became the latest supplier to invest in local plant at Gaviao Peixoto and, in return, has been given complete responsibility for the larger 190/195 wing (*Flight International*, 6-12 May).

## Test programme

To date, six development test aircraft and the first production-standard 170 have flown, and by early May the programme had completed 94% of the planned 1,800h test programme. Structural load testing is complete, and full-scale fatigue testing is on track to reach the 5,000h mark, which is required for certification, this month. On the assembly line currently is the first of two 175 test aircraft due to fly in June and the first production jet for delivery to Alitalia in late August. The first of two 195s is scheduled to fly by the end of the year, followed by two 190s in 2004.

The company is planning an initial build cycle of six months per aircraft, with the final month spent in the final assembly dock, where the fuselage is mated to the wing, empennage and cone, and the landing gear and engines are installed. More critical is the supply of long lead components, which cannot be ramped up or down as quickly as final assembly. The company plans to deliver 12 aircraft this year, starting with the six ordered by Alitalia and two for General Electric Capital (Gecas), leaving four unspoken for.

Embraer plans to increase this to as many as 45 aircraft next year, including the first four 170s for Swiss, deferred from this year, and 10 aircraft ordered by LOT, six of which will come from GECAS's earlier order for 50. This leaves a good number of aircraft unsold, which must be placed in the coming months to give suppliers enough notice. Much is riding on an expected US Airways order for up to 100 170/175s, with early deliveries the key. "If we did not have the capacity next year, then we would be well out of the race," says Fred Curado, Embraer executive vice-president airline market. ■