Ultra-long haul

TEST OF STAMINA

The Airbus A340-500 and Boeing 777-200LR are making ultra-long-haul services a reality. However, the human factor must also be considered

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The airline industry's long-held vision of non-stop flights from anywhere to anywhere has moved a step closer in recent months, with the launch of ultra-long-haul (ULR) services using the Airbus A340-500. With Boeing's similarly capable 777-200LR due in service within two years, ULR flights — arbitrarily defined as being greater than 16h in duration — look set to become an increasingly important sector of the "long, thin route" market.

With aircraft and flightcrew, not to mention passengers, successfully being stretched to the limits of their endurance, some believe the industry could eventually achieve the ultimate dream of having an aircraft that never needs to divert, crewed by pilots who operate to ship-like rosters and need never take a long-haul stopover.

Emirates inaugurated direct 14h flights between its Dubai base and Sydney in December with its A340-500s, and will use the three-class 238-seater to launch its first US services later this year. Although the initial services will be 12h flights to the US East Coast, Emirates later plans to operate direct US West Coast flights to Los Angeles and San Francisco — which will have a duration of more than 16h.

On 3 February, Singapore Airlines (SIA) set a new world distance record for commercial services, when one of its A340-500s inaugurated non-stop services from its Changi airport base in Singapore to Los Angeles (LAX). The 14h, 42min flight covered a distance of 14,100km (7,600nm) — 1,000km further than the previous record (Hong Kong to New York Newark). The return leg from LAX to Changi, which is against the winds, takes more than 18h.

SIA will break its own distance record in June, when it launches direct flights from Changi to Newark — a distance of 16,600km westbound and 15,800km eastbound (see graphic). These flights will last around 18h in each direction. To ensure that passengers on these routes are comfortable, SIA has configured its -500s with just 181 seats (compared to Airbus's three-class specification of 313 seats).

With in-flight issues rather than range now the limiting factor in making diversions, Airbus is progressively working through the list to achieve its vision of creating a "never have to divert" environment. "This is our aim, which we can achieve with our four-engine redundancy and by addressing other issues that cause diversions," it says.

Medical help

Airbus believes many diversions can be prevented by equipping the aircraft with on-board medical equipment that can be linked directly to medical centres, and training crews in the use of defibrillators. Equipping the cargo bay with cameras would enable crews to avoid unnecessary diversions due to spurious freight fire warnings, Airbus adds.

So, ultimately, the flightcrew could be the limiting factor. Despite the fact that non-stop sectors in excess of 12h have been relatively commonplace for more than a decade, there is still no industry-wide regulation for flight-crew duty time on ULR flights. In fact, since the introduction of the Boeing 747-400 in 1989 heralded the first regular direct Europe-Asia non-stop sectors, it has been an ongoing task for the Joint Aviation Authorities to draw up a pan-European set of guidelines — so far without success.

With the 747-400's range capability effectively being the yardstick for flight-crew duty time limits, the A340-500 and 777-200LR would be constrained by current guidelines for flights beyond the 400's 14-15h endurance.

"Airbus and Boeing undertook a joint initiative using the Flight Safety Foundation [FSF] as their forum, to ensure that the ultra-long-range capability of their new aircraft wasn't constrained," says Emirates senior vice-president flight operations Capt Chris Knowles. "There were three meetings — in Washington DC in 2001, in Paris in 2002 and in Kuala Lumpur in 2003. We participated in all three."

The FSF published its findings in mid-2003 and, with Emirates pioneering A340-500 operations, the GCAA, the UAE's civil aviation authority, has used the results to develop a regulatory guidance document for ULR flights — CAAP14.

"This is designed to be consistent with the findings of the FSF ULR meetings, and describes a method to enable us to operate ULR flights, rather than prescriptive legislation," says Knowles.

Before approval for a ULR mission, the GCAA requires operators to prepare an operational plan for each city pair being considered. Emirates's plan has been developed by its flight operations support department, headed by Brian Miles. The airline is basing its ULR crewing scheme on the UK Civil Aviation Authority's CAP371, which enables the extension of flight duty time through the use of augmented flight crew to allow aircrew members to have rest periods in flight.

Generally, flights beyond 8h require a third pilot, while those beyond 12h require that a second crew of two pilots (captain and first officer) relieve the first two crew and operate the cruise portion of the flight, although specific arrangements are usually subject to agreements between