

The operating cost advantage of younger generation freighters is increasing, but they also have the advantage of superior operating and field performance. This increases revenue generating capacity & flexibility.

The operational performance of medium widebody freighters

The rationale for replacing old-generation freighter aircraft depends on their unit ton-mile costs in relation to replacement alternatives. Besides basic differences in operating economics, the practical factors of reliability, unloading and loading freight, turnaround times between flights and other operational issues must also be considered to give a more detailed analysis of whether or when to consider replacing freighter aircraft.

One group of freighters that are in the process of ageing and requiring possible replacement are the medium-sized widebodies, which includes the A300B4 and DC-10-10 and -30 series. These aircraft could also be considered together with the remaining DC-8-60s and -70s in operation. This is because these three main aircraft types could potentially be replaced by the A300-600RF/A310-300F and 767-200SF/-300SF. The rise in fuel prices to about \$2 per US Gallon (USG), and the fact that larger numbers of A300-600Rs and 767s will start becoming available, therefore pushing down values, will tilt the operating economics in favour of the younger aircraft.

An examination of the operational aspects of different types of medium-sized widebody freighters with different operators will give a detailed view of operating cost issues and overall performance.

A300B4-200Fs

Most A300B4Fs are used by European carriers, many of which use the aircraft for express package operations. In the main, the aircraft are utilised five or six nights per week and operate on hub-and-spoke style route networks. In many cases aircraft only fly one return flight per night, generating utilisations of 10 to 12 flight cycles (FC) per week.

The A300B4F has a structural payload of 95,000-98,000lbs and a containerised volume of 11,200-11,500 cubic feet, depending on the container configuration used for loading the aircraft.

European Air Transport is the world's largest operator of A300B4-200Fs. Its fleet of 12 aircraft operate on a hub-and-spoke network from Brussels. The average route length is about 600nm and block time is one hour and 20 minutes.

The aircraft have a gross structural payload of 98,500lbs and net structural payload of 84,500lbs after deducting container tare weight. Not surprisingly, the aircraft do not suffer payload limitations on the route network operated.

The aircraft only operate for about 1,025FH per year and operate at a technical dispatch reliability of 99.0%. Typical unloading and loading time for freight is 40 minutes each, and a team of 10 people are required.

Air Contractors of Ireland has a similar operation, flying just four or five nights per week on domestic French routes, and between Dublin and Paris. The aircraft only accumulate about 900FH and 770FC per year, achieved with a technical dispatch reliability of 98.5%.

Varig Log DC-10-30F

Varig Log operates three DC-10-30s on medium-haul services. Despite the aircraft being certified at the highest available maximum take-off weight (MTOW) of 580,000lbs for the DC-10-30, they are only used on routes that average 1,455nm, and have a corresponding average flight time of 3.2 hours.

The aircraft also have some of the highest structural payload capabilities

available for the DC-10-30F. After deducting container and pallet tare weight, the three aircraft have net structural payloads of 150,000-152,000lbs.

The DC-10-30F's payload-range capability will allow the aircraft to carry a full payload up to 3,000nm, so unsurprisingly Varig Log does not experience any payload limitations with its aircraft.

The airline also has good operational experience with the aircraft, which achieve 100% technical dispatch reliability, and an annual utilisation of about 3,000FH and 960FC per year.

Varig Log operates the DC-10-30F on a domestic Brazilian route between Sao Paulo and Manaus, and also on a trans-South American route that starts in Sao Paulo, goes to Santiago de Chile, on to Guayaquil in Ecuador, then to Mexico City, on to Los Angeles, and then to Manaus in Brazil, before finally returning to Sao Paulo. Varig Log mainly carries freight payloads comprising automotive parts, electronic components and pharmaceuticals. The average time necessary to unload all freight is 45 minutes, and another 45 minutes are required for freight to be loaded. The aircraft have an electrical freight loading system in the underfloor section, but a mechanical freight loading system on the maindeck.

The airline says that it requires at least 120 minutes to achieve a complete turnaround, and 12 people are required to offload and load all freight between flights.

Air Hong Kong A300-600RF

Air Hong Kong started operations with the A300-600RF in September 2004, and has a fleet of six aircraft. These are factory-built freighters, rather than



converted aircraft.

Air Hong Kong has aircraft with an MTOW of 375,900lbs, almost the highest possible gross weight possible for the aircraft. Air Hong Kong operates the A300-600RF out of Hong Kong on regional services to cities in the Asia Pacific that include Tokyo, Osaka, Seoul, Taipei, Singapore, Bangkok and Penang. These cities are primarily served at night, and the airline carries mainly express freight and packages on its network.

The average route length on which the airline uses the aircraft is about 1,200nm, with an average time of two hours and 40 minutes. This compares to a range of about 2,500nm with a full structural payload. Air Hong Kong therefore does not experience any payload limitations with the aircraft. Net of container and pallet tare weight, the aircraft has a net structural payload of 47 tons, about 104,000lbs.

Air Hong Kong uses all types of containers on the maindeck of the aircraft, although AAX containers are the main type. LD-3 containers are used in the underfloor freight compartment.

Air Hong Kong has a ball mat system for loading freight on the maindeck, and ball mats plus a power drive unit (PDU) on the lower deck. It takes an average of 30 minutes to offload a full payload of freight from the aircraft, and another 35 minutes to add a full load of freight. Like the DC-10-30, the aircraft requires 12 ground staff to load and offload freight. The minimum length of time required to turn around the aircraft between flights is about 70 minutes, although in practice it will take in the region of two hours.

This must be considered in relation to the aircraft's line maintenance requirements, which include pre-flight

and transit checks, daily checks and weekly checks.

ABSA 767-300F

ABSA is a member of the Lan Group, and is a Brazilian carrier operating out of Sao Paulo. The airline was one of the first to operate the 767-300F, and its aircraft have an MTOW of 420,000lbs, the highest gross weight available for the 767-300F. The carrier operates two aircraft, which were delivered directly from Boeing.

These aircraft also have a fuel capacity of 24,140 USG. The aircraft's gross structural payload is about 120,000lbs, the highest of all widebody twins. This is utilised by several container and pallet loading options, and the aircraft has a maximum freight volume of just under 16,000 cubic feet.

Being part of the Lan Group, ABSA operates its aircraft on long-haul missions. The airline flies the aircraft on routes to Mexico City, Bogota, Caracas, Quito, Guayaquil, Lima and Santiago de Chile. ABSA also flies to Miami and Frankfurt. Operating on this route network, they generate an average utilisation of 6,100 flight hours (FH) and 1,200 flight cycles (FC) per year. This is equal to 15.8FH per day, and is one of the highest levels of utilisation achieved by freighter aircraft. This unusually high number of FH per year explains why ABSA is able to justify operating a factory-built freighter, rather than a converted aircraft.

Its route network, not surprisingly, results in an average route length of about eight hours, equal to about 3,500nm.

The airline reports that it experiences

ABSA operates factory-built 767PFs and achieves annual utilisations of 6,100FH; one of the highest achieved by all freight carriers. It uses its aircraft for long distance operations to the US and Europe, as well as intra-Latin American multi-stop services.

a 98.5% rate of technical dispatch reliability, which is impressive when its rate of utilisation is considered. The main reliability problems faced by ABSA relate to the 767-300F's landing gear and pneumatics.

ABSA's configuration gives the aircraft a structural payload of almost 126,000lbs. The aircraft's payload-range performance profile allows it to carry a full payload up to about 3,300nm. In ABSA's case this is sometimes exceeded, given its average route length and network. The aircraft suffers payload limitations when limited by maximum landing weight or when operating from high altitude airports, where the aircraft's take-off weight will be limited to less than MTOW. Despite these performance limitations, the 767-300F has one of the best operating performance capabilities of all medium widebody freighters.

ABSA's aircraft utilise the Goodrich freight loading system, which was retrofitted in June 2005. Operationally, ABSA manages to unload a full cargo of freight from the aircraft in about 30 minutes, and requires about another 40 minutes to put on a full load of freight. This implies that a minimum time of 70 minutes is required for turnaround between flights.

The aircraft have a transit check prior to every flight and a daily check with a maximum interval of 48 hours. The next highest check is the A check with an interval of 600FH. Given its average daily utilisation of 15.8FH, ABSA reports that the aircraft experiences an exceptionally low rate of technical defects.

Tampa Cargo 767-200ER

Tampa Cargo Columbia is one of the first freight carriers to operate the freighter-converted 767-200ER.

The airline is in the process of taking delivery of a fleet of six aircraft that have been converted from passenger to freighter aircraft under Bedek Aviation's modification programme, and leased from GECAS. These have been acquired to replace the carrier's DC-8-71Fs. The airline so far has taken delivery of four aircraft, with the first being delivered in late 2004. The airline is due to take two more, and also has options on a further two.

There are 16 different MTOW variants of the 767-200F for potential operators to consider. These range



between 279,900lbs and 395,000lbs, with the most common MTOW being 351,000lbs. It should also be noted that there are two basic fuel capacity versions of the aircraft: the -200 series with a fuel capacity of 16,700 USG; and the -200ER with a fuel capacity of 24,140 USG.

Tampa Cargo's aircraft have an MTOW of 351,000lbs and a fuel capacity of 24,140USG. The airline operates these aircraft from Bogota and Medellin in Colombia deep into South America to cities such as Santiago de Chile, Sao Paulo and Buenos Aires. The aircraft are also operated between Lima and Miami. In the process these aircraft fly on routes with an average flight time of three hours, and an average route length in the region of 1,200-1,300nm, which is equal to an average flight time of three hours. Some routes are more than five hours' flying time.

Tampa Cargo carries mainly perishables, but also transports general freight.

The first of these aircraft were delivered in the last quarter of 2004 and are already achieving utilisations of 350FH and 120FC per month. This is equal to an impressive rate of 4,200FH and 1,440FC per year.

The 767-200's gross structural payload varies according to the passenger-to-freighter modification programme used, and will be 92,000-101,000lbs depending on the specification weights of the aircraft. Tampa Cargo's aircraft have a gross structural payload of just under 92,000lbs, while its unit load device (ULD) containers and nets have a tare weight of about 6,200lbs. This gives the aircraft a net structural payload of about 86,000lbs.

The 767-200SF's payload-range

profile allows the aircraft to carry a full payload on a flight of up to seven hours. The aircraft can also carry a full payload out of Bogota, Medellin and Mexico City airports without any payload restrictions. These airports have elevations of up to 8,300 feet above sea level. The aircraft can operate from Bogota or Medellin to any destination in Latin America or North America with a full payload.

The aircraft are fitted with a freight handling system supplied by AAR, and the airline says that it has so far only experienced one technical problem in the 19 months it has operated this aircraft. To date it has accumulated 20,000FH and 6,800FC.

During turnaround between flights, Tampa Cargo is able to offload a full load of freight and board another within one hour, although the length of time required can extend up to 90 minutes. This can be achieved with a crew of five men and a supervisor on the maindeck and a further two on the lower deck.

The aircraft have transit or pre-flight checks prior to every flight, a daily check with a maximum interval of two hours, a weekly check up to every seven days and an A check every 500FH. Despite having some initial problems in establishing satisfactory technical reliability, Tampa Cargo reports that the performance of its aircraft has surpassed all its expectations. The airline is now experiencing a high rate of technical dispatch reliability, recording an average rate of 98.5%, and sometimes even exceeding 99%.

Star Air 767-200Fs

Star Air based in Copenhagen, Denmark is a recent operator of converted 767-200Fs. The airline is in the process of taking delivery of a fleet of

Tampa Cargo is in the process of taking delivery of six newly converted 767-200ERFs. The airline reports that the aircraft are operating with few technical problems and have no payload limitations on routes of up to five hours when departing from some of South America's highest airports.

eight aircraft. These have an MTOW of 320,000lbs and optional MTOW of 351,000lbs.

The aircraft are operated as express package freighters on a trans-European network and have an average flight distance of just 380nm, which takes one hour to complete. The operation is relatively young and the aircraft have so far achieved annual utilisations equal to about 900FH and 900FC per year. To date the aircraft have achieved an average technical dispatch reliability of 98.6%.

Like Tampa Cargo, Star Air operates converted aircraft leased from GECAS and modified from passenger to freighter-configured aircraft by Bedek Aviation.

The aircraft have a net structural payload of 91,000lbs, although this is rarely fully utilised given the low average packing density of express packages. Given the 767's strong operating performance and Star Air's short average route length, the airline reports that it does not experience any payload limitations across its network.

The aircraft are fitted with an AAR cargo loading system, and the carrier says that loading and unloading full loads of freight take a minimum of 15 minutes each, and require a crew of six.

Summary

There is little difference between old and new generation freighters in terms of annual utilisations, turnaround times between flights and levels of technical dispatch reliability. High rates of reliability should not be difficult to attain in freight operations, however, when low levels of aircraft utilisation are experienced.

Besides straightforward operating cost advantages in terms of fuel, maintenance and flightcrew, the younger generation aircraft also have the benefit of superior operating performance and longer range capability. This is illustrated by the A300B4F and A300-600RF.

Superior operating and field performance is particularly beneficial in markets such as Latin America where there are a large number of hot-and-high airports, and also where many of the routes exceed flight times of four hours.

Superior operating performance translates into increased revenue generating potential and greater flexibility on a wider number of routes. **AC**