

Runway Length Justification Report
Private and Confidential
March 6, 2002

- Runway lengths of 2,680 m and 2,130 m for the B747-400 and the A340-300, respectively, are calculated from performance charts (Standard Day) based on Standard Day conditions at 2400 m and zero runway gradient. Applying the temperature and slope correction factors these lengths increase as follows:

$$2680 \text{ m} + 630 \text{ m (Temp)} = 3310 \text{ m} + 331 \text{ m (Slope)} = 3600 \text{ m}$$

$$2130 \text{ m} + 502 \text{ m (Temp)} = 2630 \text{ m} + 263 \text{ m (Slope)} = 2900 \text{ m}$$

- Maximum allowable Break Release Gross weight at 2400 m altitude of 291,000 kg for the B747-400 and 182,000 kg for the A340-300 (consisting of Operating Empty Weight (OEW) and full passenger/baggage load plus fuel to reach Los Angeles).
- A340-300 requires less runway length for take-off than the B747-400. Using the same runway length (3,640 m) determined for the B747-400, the A340-300 is capable of flying to Los Angeles with a full passenger/baggage load plus cargo amounting to 81% of the aircraft's full payload capability.

8.0 SUMMARY

Providing the factors that drive airlines to fly certain routes is a complex and speculative task (as it depends on the specific economics of particular carriers, market protection, etc). Many, sometimes conflicting, variables must be weighed by an airline prior to deciding on such actions. The new airport has no specific history to confirm the need for regular non-stop flights to Amsterdam with E class aircraft in the short term. Even with the maximum available runway length (4,100 m), significant weight penalties would need to be imposed. Accordingly, providing a 4,100 m runway length based on speculation that airlines will be prepared to operate under such restricted conditions is an expensive capital risk that cannot be financially supported at this time.

Based on a more realistic shorter term route scenario, the team felt that providing good access to all North American and South American hub airports, where connections to other world destinations could be obtained, would result in the most cost effective solution. Based on our analysis, a length of 3,600 m was found to satisfy the operational requirements of the design aircraft serving these airports without imposing an unreasonable weight penalty on the design aircraft.

The 3,600 m length will allow the heaviest and largest commercially available aircraft to reach the most distant major American hub airports with a 100% passenger load factor. Airlines typically operate international routes with an average passenger load factor of



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between 70% to 75%. At these load factors, a typical B747-400 flight from Quito to Los Angeles would also have room for upwards to 10,250 additional kilograms of belly cargo.

It should also be noted that this 3,600 m length calculation is based on the absolutely worst operating conditions; take off along an upward sloping Runway 18, during the hottest days of the year (currently outbound flights occur in the early morning), without any wind advantage (ie. the worst of the worst condition scenario). It should also be noted that the prevailing winds at the proposed location in Puembo favour take-offs along the downward sloping direction of the runway (Runway 36). Such take-offs would generally benefit the range capability or uplift capacity of any aircraft type.

The B747-400 is unique in that it represents the world's largest passenger aircraft currently in operation. There are several aircraft types smaller than the B747-400 that will more likely, be used to service the North and South American market in the future. These aircraft can operate from the 3,600 m facility with only marginal or no cargo payload penalties at all to Los Angeles.

At present, scheduled flights to Houston and Miami are operated by B757-200 aircraft. They can be increased to B747-400s and still use the 3,600 m runway with full passenger load plus cargo. Any new European carrier would need to establish a solid business case prior to considering a direct service to Quito. If and when such a commitment was made, the financial justification for increasing the length to its maximum 4,100 m would then need to be re-examined.

In conclusion, any runway length between 3,600 m and 4,100 m was determined not to allow for any substantive increase in aircraft destination flexibility. A future 500 m extension of the facility to reach its maximum length of 4,100 m could be undertaken in the future with minimal impact on the existing airport operations as and when demand was generated. However, as a Phase 1 measure, the team believes that the 3,600 m length proposed will service the available fleet mix and anticipated airline routes for at least the next 10 years.

LA CONCLUSION ES ERRONEA PORQUE
ESTA BASADA EN UNA GRADIENTE DE
ASCENSO DE 1:40 QUE ES OPTIMA.

TABARELA TIENE UNA GRADIENTE DE 1:18 EN
PISTA (36) Y 1:13 EN PISTA (18) POR LO
TANTO LAS RESTRICCIONES DE PESO Y
COMBUSTIBLE SON GRANDES.

