

## SANTIAGO (Chile) (SCL/SCEL)

Elevation 1551ft

### CATEGORY B

AV brief not available.

### GENERAL

- Airport with joint civil-military facility
- The following seatbelt sign requirements must be observed for arrival and departures as it is a local regulatory requirement and is due to the possibility of severe turbulence over the Andes. Ensure close coordination with Cabin Crew to ensure that in-flight service and landing PA is coordinated with this requirement.
  - **Landing** – approximately 40 minutes before landing the seatbelt signs must be switched on and remain on for the duration of the flight. Passengers and crew must remain in their seats.
  - **Takeoff** – the seatbelt signs must remain on until approximately 30 minutes after takeoff. Passengers and crew must remain in their seats.
- The approximate geographic location of the above positions is to the east of JUA VOR and MDZ/SAME
- In the event of a diversion to MDZ the seatbelt sign must remain switched on for the duration of the return sector MDZ to SCL
- Santiago is in the central N/S valley of Chile with the Andes to the east and coastal hills to the west.

### Threats

#### CFIT

- Terrain to the east reaches nearly 10,700 ft asl within 18nm and nearly 22,350ft asl within 50nm
- Terrain to the west reaches nearly 6,550 ft amsl within 12nm
- Approaches follow the axis of the N/S valley
- Due to high terrain in the surround, special care should be taken during all descents. Consider the use of slower descent speed in order to avoid high rates of descents as well as excessive ground speeds over high terrain
- Terrain is depicted on the charts. It is strongly recommended to crosscheck clearances with the MRC chart.
- The magnitude of the terrain will not be visible during night arrivals and departures

#### Loss of Control

- Laser activity in the vicinity of airport Friday through Saturday and evening holidays from 2300-0400 UTC
- During adverse conditions, strong mountain waves with moderate/severe turbulence can be present. Whenever possible avoid flying parallel and immediately to the east of the Andes in the region around SCL
- Birds in vicinity of airport
- Use of the Turbulence Penetration Speed is recommended prior to and when crossing the Andes with due consideration given to the CFIT threat close to and below MSA.

#### Runway Excursion

- High energy approaches due to arrival and descent over the Andes

**Runway Incursion**

- Taxiing westbound on taxiway G, aircraft may miss turn onto taxiway P and incur on RWY 17R/35L,
- Taxiing northeast on taxiway C, aircraft may miss turn onto taxiway A and incur on RWY 17L/35R.
- Low Visibility Taxi routings as shown on the LVO taxi chart will be used when RVR is less than 550m. ATC will make reference to the geographic marking points illustrated on it.
- Departing 17L beware of the requirement to turn from the diagonal taxiway C on to A to avoid an incursion on Rwy 17L/35R

**Special Considerations**

- Minimum Runway Occupancy Time (MROT) applies: All aircraft arriving at the holding point must be completely ready to roll into the position on the runway and immediately start the take-off after receiving authorization. If unable to start the take-off, the said authorization will be cancelled, and instructions will be given to leave the runway at the first available taxiway.

**ARRIVAL**
**Diversion Airports**

Mendoza	MDZ/SAME	107 nm/071°T	CAT B
Concepcion	CCP/SCIE	232 nm/208°T	CAT A
Cordoba Intl Airport	COR/SACO	385 nm/079°T	CAT A
Buenos Aires (Ezeiza Intl)	EZE/SAEZ	619 nm/098°T	CAT A

**Approach**

- Preferential LDG RWY 17L and 17R with tailwind up to 10KT
- The primary landing runway is 17L which is CAT IIIB capable
- Occasionally landings are permitted on 17R at night but the use of reverse thrust is not permitted between 2200 and 0000 local time.
- The preferred approaches are the ILS Y 17L and ILS 17R. When RVR is <550m the ILS Z 17L will be used.
- Simultaneous parallel approaches to Runways 17R und 17L may be made using ILS, RNAV (RNP/GNSS) procedures when indicated on the approach charts.
- The preferred STARs crossing the Andes route via SIMOK or ASIMO. STARs routing via UMKAL should be avoided, especially when mountain wave activity or moderate/severe turbulence is expected as this is the area where it will be at its worst. See Mountain Weather below for background on possible re-routing decisions due turbulence over the Andres.

**Initial Approach**

- Radar is available but particular care should be taken to monitor aircraft position in relation to high ground.
- Transponder code for entry in to Chilean airspace is allocated before crossing the Andes

- It is customary when passed to Mendoza Control to request turbulence reports for the Andes. Equally when released by Mendoza after crossing the Andes give a report for the guidance of other crews.
- The descent profile over the Andes is such that a light tailwind can make it difficult to maintain the ideal profile so proactive energy management will be required.

### GROUND

- Departure/Arrival Low visibility taxi routes available
- Surface Movement Guidance and Control System (SMGCS) in use when LVP activated.
- The preferred arrival taxi route to the International Apron is:
  - 17L: B, A, C and G
  - 17R: U and G
- The preferred departure taxi route from the International Apron is:
  - 17L: G, C and A
  - 17R: G, H, Z and V

### DEPARTURE

- Preferential TKOF RWY 17L and 17R with tailwind up to 10KT. The primary departure runway is 17R, except between 0000 and 0700 local time when it is not available for noise abatement reasons.
- Call for clearance 15 mins before departure to avoid delay
- Recommended SIDs are via DILOK, DONTI and GUVOL. The shorter track mileage SIDs routing East immediately after departure should not be used as terrain clearance will not be achieved without a significant reduction in payload.
- The recommended SIDs provide the greatest track mileage in order to gain altitude prior to crossing the Andes
- On departure the seatbelt sign should be left on until the Andes are crossed eastbound. Advise the CSD of this.

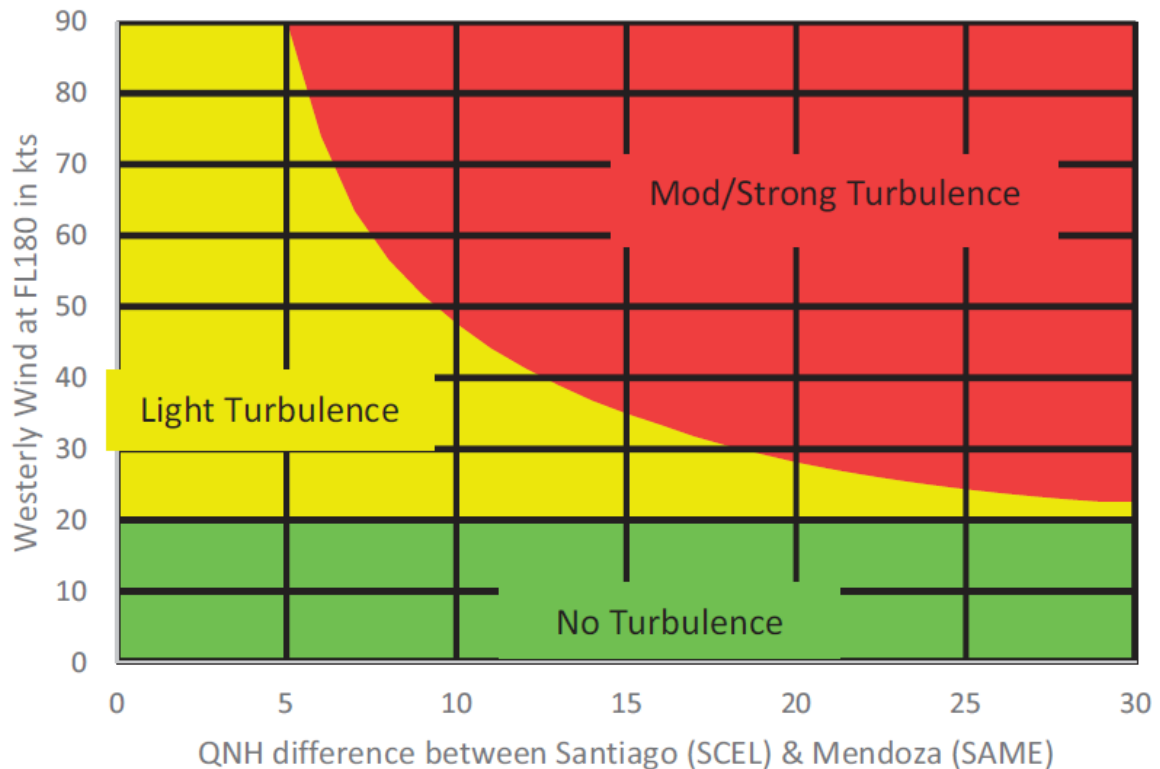
### WEATHER

- Highest incidences of fog reported from May through July, averaging 22 days per months during this period. Smoke and haze as well as dust and sand average 23 days per month from May through August. Overcast ceilings are predominant from May through July. Fog usually clears by 1000-1100 local time in spring and summer, but not until 1200-1300 local time during winter. The airport is CAT IIIB capable.
- Smoke and haze as well as dust and sand obstructions reported from May through August,
- Overcast ceiling is predominant sky condition from May through July,
- Prevailing winds are from south southeast in January, March, and June and rarely exceeds 15kts.
- Frontal activity that brings poor weather has a prevailing Northerly wind
- Temperature between 7°C (March to May) and 29°C (December to February)

**MOUNTAIN WEATHER**

- The following chart can be used to give an indication of whether mountain waves and associated severe turbulence can be expected in the region to the east of Santiago in the vicinity of UMKAL:

### Turbulence/Mountain Wave Prediction Chart



- Weather over the Andes is normally good
- In winter there might be cloud cover, whilst in summer Cb activity is often evident on the W side rising to over 40,000 ft; however they tend to be isolated and do not present a severe problem.
- A 100-150 kt jet stream, West to East at FL350-390, is a permanent feature but does not affect the FLs normally used to cross the Andes. There are other features, however, of which crews should be aware:
  - Cb Activity** – not only over the mountains, but also over the Argentine plains, similar to North America. It can be frontal or isolated.
  - Orographic Turbulence** – when the lower winds (FL150-FL300) are strong (80kt+) a lower crossing of the Andes is not recommended due to the turbulence caused by the mountains at these levels. In this case it is suggested that a high crossing (FL330) be made via SIMOK or ASIMO or more northerly routing. Another alternative is to proceed via ANKON or further where the mountains are lower.
  - Clear Air Turbulence** – by far the most dangerous conditions. It does not occur frequently and it is highly predictable.
- The situation is caused by the rapid movement of an entire air mass from West to East with the result that mountain waves form in increasing severity up to FL400

- This results from a large differential atmospheric pressure from West to East and will generally occur when the QNH at Santiago differs by 10hPa or more from that at Mendoza.
- The humid, fast-moving air creates rotor turbulence above and downwind of the Andes. These rotors extend from ground level to altitudes above FL350. The rotors, combined with the severe mountain waves, give rise to turbulence.
- Visual cues of this are:
  - Lenticular or roll clouds on the easterly edge of the Andes
  - Dust storms on the Argentine side as the air mass descends
- These conditions can occur at any time of year
- When the conditions above are forecast, or there is even a suspicion of it and the usual northerly arrivals via ASIMO or SIMOK are not available, arrivals via ANKON or further south can be used. The Andes are lower at this point and the mountain wave effect and turbulence is much reduced.

### OPERATIONAL INFORMATION

<b>Handling Agent</b>	Acconia/Andes
<b>Handling Agent VHF</b>	130.825
<b>Potable Water</b>	Uplift permitted

<b>IF ONLY Electrical Power is required</b>	<b>Use ground power at all times</b>
<b>If BOTH electrical power and air conditioning is required:</b>	<b>Use both ground services at all times</b>