SAN FRANCISCO (SFO/KSFO)

Elevation 13ft

CATEGORY B

AV brief - required

BAV AV brief – not yet available

FAA PRM Approach guidance -
https://www.faa.gov/training_testing/training/prm/media/PRM_training.pptx

GENERAL

- Airfield located 12 nm S of San Francisco city on the W shore of the bay.
- Both arrival and departure patterns are heavily influenced by the proximity of a number of military and civil airfields, in particular Oakland to the NE.
- There will be no BA Ops Personnel on station until 2.5 hours before STD. However, in winter 2019/2020, the BA set up person will be available on station from 11:30L (11:00L Summer Schedule) who will be able to review any urgent ACARS.

Threats

CFIT

- San Bruno mountain, 1,500ft asl, lies 4 nm NW and is one of a range of coastal hills, extending from NW to S, which come within 3 nm W of the airfield at the closest point with elevations up to 2,000ft asl. These hills greatly influence arrival, departure and missed approach procedures.
- Further high ground to the E and NE on the E side of the bay but at ranges in excess of 13 nm.
- The terrain gives a high associated descent MSA, although the SSA is considerably lower.
- Review actions in event of Ground proximity caution and Ground proximity warnings.
- Be aware of rate of descent limits when descending below 3000ft above relevant MSA or SSA.
- Consider the use of terrain radar if available also full use of autopilot to facilitate look-out and situational awareness.
- Terrain significantly influences departures. There are associated emergency turn procedures, and non standard acceleration and thrust reduction heights (see dispatch performance manual).

Loss of Control

- See DEPARTURES section for risk of low climb out speed events on Rwy 28L/R due to change in strength of WNW winds above ground level.
- With the bay to the N and E birds can be a problem.
- During summer months there can be particularly noticeable positive WINDSHEAR below 200', caused by sea breezes in the Bay Area, which coupled with the aircraft's ground effect can destabilize the latter part of finals.

Runway Excursion

- San Francisco has a history of high energy and rushed approaches.

Threats
Ground Collision • Taxi in often involves crossing an active runway. If landing on 28R, do not cross 28L until cleared. • Landing 28R, particularly at night, be aware your planned runway exit may not be available due previous landing aircraft holding short of runway 28L on your exit (each exit only has room for one aircraft). Consider asking ATC if planned exit is available or for their preferred exit point to avoid blocking runway. This will greatly reduce your runway occupancy time and could prevent unnecessary go-arounds. **Mid Air Collision** • Close simultaneous parallel (PRM) approaches to Rwy 28L and Rwy 28R are authorised for use by BA aircraft. • BA has experienced a significant number of TCAS RA events in the vicinity of SFO, particularly during PRM operations. Ensure crew is well briefed on TCAS procedures as well as PRM and SOIA approaches. When PRM approaches to RWY 28L/R are in use, advise Bay Approach Control on first contact if a single file approach is required. A minor delay may be incurred. • Threats include Oakland traffic and departing SFO aircraft that have caused TCAS RA events.

A380

- In the current condition, there are TWO available runways for the A380 to land and depart at SFO.
- The two runways are 10L/28R and 19L/ 01R.
- A380 can now also land on Rwy 28L.

Rwy 28R/10L

- A380 can operate on runway 28R under Category I/II/III weather condition.
- Rwy 10L does not have an ILS.
- A380 can operate unrestricted on taxiway and runways except for the following condition:
  - During CAT II/III operation (28R RVR below 1800ft), only one A380 is permitted on Taxiway C between Taxiway P and Approach End, when arrivals cross the 28R threshold.

Rwy 19L/1R

- Rwy 01R does not have an ILS.
- 19L is not equipped for CAT II/III operations.

  When Landing 19L, Pilots should at all possible avoid rolling pass Taxiway M. Doing so will require the A380 to make an 180° turn on the runway as taxiways south of Taxiway M are restricted.

  Set BTV (Brake-to-Vacate) systems (if practical) to exit at Taxiway G, H and no later than M.

ALL

ARRIVAL

Diversion Airports			
OAKLAND	OAK/KOAK	10 nm/050°T	CAT A
SACRAMENTO	SMF/KSMF	75 nm/030°T	CAT A
LOS ANGELES	LAX/KLAX	293 nm/140°T	CAT B
SAN DIEGO	SAN/KSAN	388 nm/139°T	CAT B
SEATTLE	SEA/KSEA	590 nm/000°T	CAT A

- Rwys 01L and 01R are not approved for landing for any BA aircraft types. This is due to the lack of published approaches, no approach lights or vertical guidance and rising terrain close to the threshold of the runways. In the event of strong northerly winds consider use of 28L/R if crosswind is in limits or holding/diversion as appropriate.
- Routings into SFO are normally via Red Bluff (RBL) or Mustang (FMG) and then Golden Gate or Modesto STARs. Track miles are often shortened with a direct routing to Point Reyes (PYE) or a direct to LOZIT or CEDES. Expect 11,000ft at these waypoints. The exact arrival routing should be requested from ATC on first contact.
- Clearance to cross SFO maintaining 11,000ft is typical.
- Include relevant configuration and speed targets in the descent briefing to ensure that the aircraft energy is effectively managed. Often there is a short distance to run with considerable height to lose.
- Heading off the VOR will indicate whether a left or right pattern is to be flown.
- Left pattern tends to have greater track miles and produces fewer issues with energy management, though it is still wise to configure early. It is prudent to lose height downwind, whilst maintaining speed, and then reduce speed on the base leg (B747 – consider F10 on the base turn).
- Beware asking for a 10 nm final as this can be misinterpreted as a request for a shortcut. Optimal distances for the turn for ATC are a turn on at 12-14 nm. If in doubt prompt when downwind for track miles and ask for more if necessary.

Requests for “at least a 10 mile final” will generally be accepted by ATC, however traffic for OAK Rwy 29 may impact your plan if you are right hand downwind for Rwy 28R.

- When Rwys 10/19 in use (due to poor weather) approach delays of up to 30 mins are possible.
- It is highly probable that, when arriving via the BDEGA1, the assigned runway transition and landing runway will differ.
- Below is what you may hear from NorCal Approach:

<Callsign> Descend via BDEGA One Arrival Runway 28 Left Transition, expect ILS/Visual approach Runway 28 Right.

Approach

- Although usually the ILS can be expected, there are several final approach options. These include an ILS PRM for 28R, LDA/LDA PRM for 28L, a Quiet Bridge for 28L/R or the Tipp Toe for 28L.
- SFO has an active noise reduction programme; if arriving between the hours of 23.00L-06.00L request a Quiet Bridge Visual approach and avoid overflying residential areas on the coastline if at all possible.
- Expect ATC requests of 180 kt to 6 nm, 170 kts to 5 nm or the more familiar 160 kts to 4 nm.
- Please note that the go-arounds from the published visual approaches are different from standard US and there is a requirement to maintain a specific heading.
- A late visual switch is unlikely for a heavy, but it's certainly worth reviewing the procedure for this and for the PRM breakout manoeuvre.
- Feedback suggests that go-arounds are well handled by ATC, though again be cautious of an early turn in.
- Expect a heading of 265-280 climbing to 3000' or 4000' if you go around, climbing to 5000' over the ocean on handover to Norcal for a left hand downwind.
- Wind is predominantly westerly due to the topography of the bay.
- Note that the DME reads 2 nm at the threshold of 28L/R (adding to the chances of a rushed approach).
- When landing on Rwys 28L/R be prepared for traffic to depart on Rwys 01L/R at a late stage of the approach.
- When simultaneous visual approaches are in use Rwys 28L/R, advise Bay Approach Control on first contact if a single file approach (i.e. not side by side at 750ft separation in VMC) is required; a minor delay of about 5 mins may be incurred.
- ATC frequently "cut in" small jets and light aircraft ahead of large aircraft on long finals.
- Missed approach procedures are heavily influenced by terrain. It is important to ensure that tracks are accurately flown.
- Twy Z is frequently used to cross aircraft during landing operations. This may appear as a runway incursion. If in doubt, ask ATC for clarification.

Quiet Bridge Visual

- It is imperative that the instrument portion of the approach is flown.
- The instruction is typically "cleared visual 28L/R via the Quiet Bridge approach".
- You are expected to maintain the SFO 095R until passing the San Mateo Bridge at the specified height before the turn towards the runway is made. This results in a significant offset, especially for 28L.
- Similarly the restrictions specified on the Tipp Toe Visual for 28L must be complied with.
- Note that you will be expected to maintain separation from any other traffic you have confirmed to ATC as having in sight.
- Unusually, both approaches, although being visual, have promulgated Missed Approach procedures.
- Although there is a note relating to Close Spaced Parallel Approaches these procedures apply to all Quiet Bridge and Tipp Toe approaches.
- ATC SFO advise that the Quiet Bridge visual is primarily for arrivals to Rwy 28R and Tipp Toe for Rwy 28L.

Suggested review items to consider for the approach brief include:

- *Terrain* – ROD within 3000' of MSA, review GPWS pull-up G/A recall actions.
- *Energy management* – Establish Bottom lines/Gates, what to do if it goes wrong (Effectiveness of early gear selection).
- *FMC Programming* – Use of RTE1 and RTE2 for different arrivals/runways.
- *Traffic Density* – Review TCAS RA manoeuvre.
- *ILS PRM approach* – Review breakout manoeuvres/late runway changes.

GROUND

A380

Taxi Routes

- All taxi routes described are for informational use.
- ATC has authority to supersede these routes and assign any approved taxiways for arrival and departure of the A380 at SFO.

Restrictions

The following restrictions apply to all taxi routes:

- When the A380 is on Twy A south and west of Q1, aircraft passing abeam on
- Twy B are restricted to a wingspan of 187ft or less.
- When the A380 is on Twy B between Q and M, aircraft passing abeam on Twy A are restricted to a wingspan of 129ft or less.
- A380 is not permitted to operate on Twy B, between Twy B5 to Twy Q.
- A380 is not permitted to operate on Twy A, between Twy Q1 to Twy H and between Twy M and 1R.
- A380 is not permitted to operate on Taxilane H west of Twy A.
- Only one A380 on Twy B between Twy J and Q, and on Twy Z between Q and S1, when 10R arrival crosses threshold.
- Only one A380 on Twy B between Twy F1 and Twy M, when 1L arrival crosses threshold.

Landing 28R Taxi Route

To Boarding Area G

- A380 exits Runway 28R at Twy Q.

  Expect clearance via Twy Q to A, blocks at G101.

- A380 exits Runway 28R at Twy T.

  Expect clearance via Twy B to Q1 to A, blocks at G101.

To Boarding Area A

- A380 exits Runway 28R at Twy T.

  Expect clearance via Twy D to B to Boarding Area A (Ramp Tower 127.575) for parking at 9A or 1A. Expect to use Taxilane M to 9A and Diamond Lane for 1A.

- A380 exits Runway 28R at Twy E.

  Expect clearance via Twy E to B to Boarding Area A (Ramp Tower 127.575) for parking at 9A or 1A. Expect to use Taxilane M to 9A and Diamond Lane for 1A.

Landing 19L Taxi Route

To Boarding Area G

- A380 exits Runway 19L at Twy G or H.

  Expect clearance via Twy G/H to B to Q1 to A, blocks at G101.

- A380 exits Runway 19L at Twy M.

  Expect clearance via Twy M to Q1 Twy A, blocks at G101.

To Boarding Area A

- A380 exits Runway 19L at Twy G or H.

  Expect clearance via Twy G/H to B to Boarding Area A (Ramp Tower 127.575) for parking at 9A or 1A. Expect to use Taxilane M to spot 9A and Diamond Lane for spot 1A.

- A380 exits Runway 19L at Twy M.

  Expect clearance via Twy M Boarding Area A (Ramp Tower 127.575) for parking at 9A or 1A. Expect to use Taxilane M to 9A and Diamond Lane for 1A.

Push-back and Tow Operations

Push Back from G101

- Push back requested from Ramp Tower G on frequency 119.225.
- Upon Ramp Tower G clearance, an A380 aircraft is pushed back and cleared to Spot 10.

Secondary G102

- G102 is currently being evaluated as a secondary gate in Boarding Area G. The A380 has not been fit tested at this gate, but space is adequate for the A380 with impacts to adjacent G100. There are two bridges with limited support (utility/fuel) for the A380.

Push Back from 1A or 9A

- Push back requested from Ramp Tower A on frequency 127.575.
- Upon Ramp Tower A clearance, an A380 aircraft is pushed back and cleared to Spot 1.

Equipment Staging

- All International Terminal gates are common use gates and have no provision for ground service equipment (GSE) parking.
- GSE shall be staged only for flight arrivals and departures for a period of time that is reasonable to prepare for flights. With the A380 operation, it is critical that gates G101, 1A, and 9A remain free of GSE parking.

Departing 28R Taxi Route

From Boarding Area G

- A380 leave Boarding Area G via Twy A.

  Expect clearance via Twy A " Q1 " B " F " 28R threshold.

From Boarding Area A

- A380 leave Boarding Area A via Taxilane M.

  Expect clearance via Twy M " B " G " L " F " 28R threshold.

- A380 leave Boarding Area A via Taxilane M.

  Expect clearance via Twy M " L " F " 28R threshold.

Departing 1R Taxi Route

From Boarding Area G

- A380 leave Boarding Area G via Twy A.

  Expect clearance via Twy A " Q1 " B " M "1R threshold.

From Boarding Area A

- A380 leave Boarding Area A via Taxilane M.

  Expect clearance via Twy M " 1R threshold.

ALL

BAV Crew Reports
• *Crew reports suggest that soft tarmac or depressions at Twy hold points and pushback positions may cause some problems in starting to taxi – particularly in the summer months.*

ALL

After Landing

- If landing on 28R, do not cross 28L until cleared to do so.
- Only contact Ground when instructed to do so.
- Remain on the taxiway used to vacate the runway until clearance to continue is received.
- Consider use of wing tip lights, as it is not uncommon for large aircraft to pass on Taxiways M and H.
- The taxiway abeam the end of Pier Alpha is fairly tight.
- See Lido AOI pages for 747-400/wide-body taxiway restrictions.
- Parking stands are generally A2-A10 at the International terminal.
- Arriving and departing flights pass on/off blocks times via Company VHF and monitor on the ground for possible gate changes.

A380

- The table below shows historical data for the percentage of flights when the time between vacating the runway and parking the aircraft was greater than 7 minutes. An opportunity therefore existed to shut down engines 1 & 4 (or 2 & 3).

  Considerations:

  1. Whilst taxiing, lookout and monitoring are of prime importance. The risk of GCOL must always be addressed;
  2. The time period of 7 minutes assumes a 5 minute engine cool-down period and also allows a buffer of 2 minutes to park the aircraft.

     Note: Shutting engines down whilst parking the aircraft could cause unnecessary distraction and is inadvisable;

  3. Ground testing has shown that there is no perceptible difference in manoeuvrability dependent on whether engines 2 & 3 or 1 & 4 are shut down.

Landing Runway	% Flights with Taxi-in time >7 Min
19L	100%
28L	100%
28R	98%

ALL

- There will be no BA Ops Personnel on station until 2.5 hours before STD. In case the flight arrives early, there will be no Agent assigned to man Ground to Air or respond to Flight Deck Calls as the BA Ops Agent will start their duties 2.5 hours before STD.
- However, in winter 2019/2020, the BA set up person will be available on station from 11:30 AM (11:00 AM Summer Schedule) local time who will be able to review any urgent ACARS.

Parking

- Gate A1 is a tow on stand. Expect to be towed on from abeam Gate A3 with engines shut down.

Departure

- You will be expected to change to the tower frequency without being instructed when ready for take-off.
- Rwy 01L/R results in a very short taxi.
- Rwy 01R Departures: If taxi clearance is via Bravo-Alpha-Alpha1, ATC expects that the aircraft will stay on Twy B until it intersects with Twy A near the south end of the airport.
- Rwy 28R Departures: When widebody aircraft are holding between Rwy 28L/R, ATC will verify, using Ground Movement Radar, that the aircraft is correctly positioned within the holding lines before issuing take-off clearance.
- Taxying aircraft are NOT permitted to cross Twy Z during departures from either 28 runway.

DEPARTURE

- Certain SIDs are not approved for use. Refer to CARD/Performance manual/OIS (A380)/OPT (B787) for details.
- Reports of “parallel take-offs” have been received. As with all take-offs in the US, immediate compliance with a take-off clearance is assumed. If you wait for separation from the other traffic, it is likely your clearance will be cancelled.
- The gap in the mountains at the end of Rwy 28L/R produces a near year round W-NW wind which increases in strength during the summer months. There are a number of low climb out speed events seen during these months which are caused by the ground level headwind rapidly disappearing around 400ft. Ensure speed is monitored during the climb out especially at around 400ft when distractions such as ATC frequency changes may occur.
- If planning to depart from runway 01R, note that some SIDs from this runway (e.g. TRUKN and SFO) have a published minimum crossing altitude of 3000ft at TYDYE/SFO D6. Pilots should ensure this restriction is complied with due to interaction with OAK traffic.
- An A380 flight crew have reported being given take-off clearance from 28R with an aircraft positioned on taxiway D between 28R and 28L. Be aware that aircraft positioned between the runways may appear close but sufficient clearance does exist and this is allowable under current airfield procedures. If in doubt about the proximity of aircraft holding between the runways then ask ATC.
- A car park at the end of RWY 28L/R has resulted in vehicle lights being shone directly down the runway. In low visibility conditions this could potentially give the impression of an oncoming aircraft.

For the departure brief review:

- *Terrain* – Emergency Turn, review GPWS pull up G/A recall actions.
- *Performance Restrictions* – most suitable departure runway, non-standard thrust reduction/accel heights.
- *Continuation policy in event of shut-down* – double engine failure drift down.

B777

- CARD produces a selection of flap settings for take-off depending on the departure runway. Be prepared to change the take-off flap required in the event of a runway change.

ALL

WEATHER

- Surface wind is usually W'ly; turbulence should be expected on short finals.
- Winter – Often unsettled with strong winds, poor visibility and heavy rain. Thick fog associated with high pressure occurs about 4 days per month.
- Summer – Morning stratus off the sea occasionally lowering to give fog.

OPERATIONAL INFORMATION

Handling Agent	BA (CUSTOMER) DNATA (RAMP) MENZIES (CARGO) BA (ENGINEERING) GATE GOURMET (CATERING)
Handling Agent VHF	129.7
Potable Water	Uplift Permitted

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