



**SANTA CLARA/SANTA CRUZ COUNTIES  
AIRPORT/COMMUNITY ROUNDTABLE**

PO Box 3144  
Los Altos, CA 94024

January 17, 2020

Ms. Raquel Girvin  
Regional Administrator, AWP-1  
FAA Western-Pacific Region  
777 South Aviation Boulevard, Suite 150  
El Segundo, CA 90245

Subject: SCSC Roundtable Requests Regarding the PIRAT STAR

Dear Administrator Girvin,

The SCSC Roundtable is submitting the following three requests regarding the PIRAT Standard Terminal Arrival Route (PIRAT STAR) for the FAA's review and response:

1. The SCSC Roundtable accepts Adam Vetter's August 28, 2019 offer to have the FAA perform an in-depth analysis of PIRAT STAR usage. A preliminary analysis of SFO PIRAT STAR arrivals indicates that usage may have increased by almost 20 percent for the months of May and June in 2019 versus May and June of 2018 even though the total SFO arrivals during those same periods did not increase. The Roundtable requests an historical review of the number of Oceanic Arrivals to determine whether they have increased since the PIRAT STAR was implemented. The Roundtable requests that the FAA model the noise exposure on the ground for Oceanic Arrivals for the land area located between the Pacific coastline and the western shoreline of the San Francisco Bay from 2013 to 2019 (see Appendix A for specifics on the requested analysis).
2. To understand whether the original expectations about the PIRAT STAR's noise exposure described in the CATEX for the PIRAT STAR match reality, the SCSC Roundtable requests that the FAA validate the assumptions made in the PIRAT STAR CATEX. (See Appendix B for important context information about Oceanic Arrivals before/after PIRAT and specific questions that the Roundtable would like the FAA to address). This question can leverage the data obtained from the analysis in item 1 above.
3. Given that the PIRAT STAR CATEX information received by Palo Alto through its FOIA request and other FAA communications on the PIRAT STAR are at times inconsistent, the Roundtable requests that the FAA provide a history of the PIRAT STAR development since 2013 as well as describe in simple terms the differences between a previous PIRAT STAR version that may have existed before the current PIRAT STAR. (See Appendix C for specific questions that should be addressed and important context information about a previous PIRAT STAR procedure).

On behalf of the SCSC Roundtable, thank you for your attention to these requests. We look forward to your response in the near future.

Sincerely,

Mary-Lynne Bernald  
Chairperson, SCSC Roundtable

## APPENDICES

### Appendix A: Analysis of Historical Noise Exposure on the Ground for SFO and OAK Oceanic Arrivals between the Pacific Coastline and Western Shoreline of the San Francisco Bay

- Scope: SFO Oceanic arrivals and OAK Oceanic Arrivals from the Pacific Ocean coastline all the way to each ILS landing system.
- Time period:
  - Same 4-month period of May through August (this 4-month period should be sufficient for comparisons purposes; April should not be used because PIRAT was officially implemented on April 25, 2019; September should not be used because of runway closures at SFO).
  - Seven years (2013, 2014, 2015, 2016, 2017, 2018, 2019) to capture pre-NextGen and post-NextGen changes, including procedure and vectoring changes.
- Tools: Noise modeling should be done using the latest version of AEDT and noise exposure should be calculated using the CNEL metric, which is recognized by the FAA.
- Data input:
  - Use actual flight data.
  - Document any assumptions made for data input.
- Data output/Report details:
  - Summary tables and graphs should be provided to allow readers to compare yearly data from 2013 to 2019 for the same four-month period.
  - Detailed data that are used to create summaries or requested in this document should be provided in an Excel or CSV format.
  - For the same time period of each year, please provide the following information:
    - Total number of arrivals for each airport (SFO, OAK)
    - Total number of Oceanic arrivals for each airport (SFO, OAK)
    - Number of Oceanic arrivals broken down by destination airport (SFO and OAK) that flew within:
      - 1 mile and 3 miles of the Woodside VOR or ARGGG
      - 1 mile, 3 miles, and 5 miles of either MENLO or SIDBY

#### Notes:

- Data should be summarized for each scenario (e.g., a combination of destination airport and a distance from a specific waypoint)
- Different distances are used for the two locations because flights are on a procedure up to the Woodside VOR/ARGGG but vectored to MENLO/SIDBY after that.
- Distances represent on-the-ground projections between waypoints and aircraft.
- The shortest distance between waypoints and aircraft should be used to capture a flight.
- Detailed data of Oceanic arrivals near 2 locations
  - Location A: within 1 mile and 3 miles of the Woodside VOR (2018 data and before) and ARGGG (2019 data)
  - Location B: within 1 mile, 3 miles, and 5 miles of MENLO and SIDBY once SIDBY started to be used for Oceanic arrivals

For each Oceanic Arrivals scenario (e.g., waypoint location and distance from waypoint), provide the following data:

- Date and time stamp
- Flight number
- Aircraft type
- Origin airport
- Destination airport (SFO or OAK)
- Altitude at time stamp
- Distance from waypoint at time stamp
- Speed at time stamp
- Number of Oceanic arrivals broken down by:
  - Daytime, evening, and nighttime (Evening is 7 pm – 10 pm and nighttime is 10pm to 7am)
  - Heavy Jets, Large Jets, Small Jets, Turbo Props
  - Destination airport (SFO and OAK)
  - Heading (range, average, and median) used after Woodside VOR or ARGGG for each destination airport
  - Descent angle (range, average and median) used between Woodside VOR or ARGGG and MENLO or SIDBY
  - Procedure used --specify name and end point (3 procedures/end points combinations: Pacific 2 Tailored Arrivals/Woodside VOR, non-Pacific 2 Arrivals/Woodside VOR, and PIRAT/ARGGG)
- Altitudes (range, average, and median) within 1 mile or 3 miles of the procedure end waypoint (Woodside VOR or ARGGG)
- Altitudes (range, average, and median) within 1 mile, 3 miles, and 5 miles of MENLO or SIDBY
- On a Google street map, show actual ground tracks between the Woodside VOR or ARGGG and the ILS system, use different colors to show the flights altitude bands in 1,000 ft increments (<3,000 ft, 3000 to 3999 ft, etc.), and identify the median ground track line
- Horizontal and vertical distribution of ground tracks in the vicinity of the Woodside VOR or ARGGG:
  - Using a 3-mile line centered between ARGGG and the Woodside VOR, display separately for SFO and OAK as well as cumulatively (SFO+OAK) the:

Number of actual flights

Lateral and vertical distribution of actual flights

Range, average, and median altitudes

Range, average, and median speeds

- Maintain the same scale for the axes across all time periods and provide sufficient granularity in the display for readers to be able to identify potential changes over time. Use tables and graphs to display the data.
- Horizontal and vertical distribution of ground tracks in the vicinity of MENLO or SIDBY:
  - Using a 5-mile line centered between MENLO and SIDBY (a wider radius is suggested to capture potential vectoring dispersion), display separately for SFO and OAK as well as cumulatively (SFO+OAK) the:

Number of actual flights

Lateral and vertical distribution of actual flights

Range, average, and median altitudes

Range, average, and median speeds

- Maintain the same scale for the axes across all time periods and provide sufficient granularity in the display for readers to be able to identify potential changes over time. Use tables and graphs to display the data.

- Total number of flights broken down by arrival route (SFO SERFR, SFO Bodega West, SFO Oceanic, OAK Oceanic, SJC South Flow) that flew within the following distances of MENLO or SIDBY:
  - Within 0.5 mile radius
  - Within 1.0 mile radius
  - Within 1.5 mile radius
  - Within 2.0 mile radius
  - Within 2.5 mile radius
  - Within 3.0 mile radius
  - Within 5.0 mile radius

For each of the 7 distance groups listed above, specify the altitudes (range, average, and median) and speeds (range, average, and median)

## Appendix B: Oceanic Arrivals Before and After Implementation of the PIRAT STAR

Using actual flight data for the months of May through August for both 2018 and 2019, the SCSC Roundtable requests that the FAA:

1. Compare actual number vs assumed number of Oceanic Arrivals in total and broken down between Pacific 2 Tailored Arrivals, non-Pacific 2 Tailored Arrivals, and PIRAT:
  - a. For each airport (SFO and OAK)
  - b. Within a 3-mile radius of the Woodside VOR or ARGEGG
  - c. Within a 5-mile radius of MENLO or SIDBY
2. Compare actual fleet mix vs assumed fleet mix of Oceanic arrivals.
3. Compare actual time distribution vs assumed time distribution of Oceanic arrivals.
4. Using AEDT, display the CNEL contours for 3 different Oceanic arrivals procedures in 3 different areas
  - a. Procedures are:
    1. Pacific 2 Tailored Arrival, which is optimized for each aircraft for a low noise descent profile all the way to the runway and existed before PIRAT
    2. Non-Pacific 2 Tailored Arrival, which existed before PIRAT
    3. PIRAT arrival, which is not optimized for each aircraft, ends miles away from the runway, and is vectored to final approach
  - b. Three suggested areas between the Pacific Ocean and the ILS system: around Woodside VOR/ARGEGG, around MENLO/SIDBY, plus around one additional location between ARGEGG and SIDBY.
  - c. Noise contours for at least 2 different types of jets: heavy jets and large jets.
  - d. References for data sources (actual data or assumptions) and documented assumptions.
  - e. Small area (maximum 5-mile radius) near each waypoint with CNEL contours displayed in 3-dB increments or less for readers to be able to observe any potential differences.
5. Using actual flight data for 2018 and 2019, display the different CNEL noise exposure contours in 3-dB increments in 2 locations (one near Woodside VOR/ARGEGG and the other near MENLO/SIDBY) for the:
  - a. Pacific 2 Tailored Arrivals (2018) --specify number of flights
  - b. Non-Pacific 2 Tailored Arrivals (2018) - specify number of flights
  - c. PIRAT (2019) - specify number of flights

and articulate any potential differences. Same guidelines as in item 4 above.

6. Articulate the benefits that have been realized through the implementation of PIRAT (benefits statements must be supported by data), and in particular the incremental benefits gained from the prior procedures (Pacific 2 TA and non-Pacific 2 TA).
6. Explain how the altitude increase that occurred at ARGEGG does not increase the noise exposure of PIRAT arrivals over the residential areas between ARGEGG and the final approaches to SFO or OAK, which did not change. Describe in particular the changes in the flying altitudes and descent angles of aircraft between ARGEGG and final approaches that may have occurred given the minimum 8,000 ft altitude at ARGEGG.
6. Identify who decided to combine the Tailored Arrival procedure with the ATC vectoring instruction as described in the FAA written answer to the Roundtable question 5 from May 2019 and list all stakeholders who were consulted on the proposal prior to the decision.
6. Identify the stakeholders and elected officials who were involved in the current PIRAT design discussions as well as the timeframe of such discussions.
6. Document when and how SFO and the City and County of San Francisco expressed their support of the current PIRAT procedure.

## Context information

The FAA document called “2018-06-11 KSFO.IER.ARCHI.20180517 (SIGNED)\_MLsign”, signed on May 18, 2018 and obtained through a FOIA request by the City of Palo Alto, provides some information on the environmental review conducted by the FAA for PIRAT and describes some assumptions used in the CATEX analysis. In this document, the FAA stated that:

- They did not expect the number of operations, aircraft mix and airlines schedules to change. Based on 2017 Track Data (table 6 on page 15), the FAA expected the following traffic:
  - Annual PIRAT traffic: 15,747 planes per year
  - Fleet mix: 64% Heavy Jets vs. 36% Large Jets (very few small jets or turboprops)
  - Time distribution: 31% during night time (10 pm - 7 am) and 69% during the day

Note however that, in their February 22, 2019 letter to Palo Alto Mayor Filseth, the FAA stated that they “anticipate more aircraft will likely use the PIRAT STAR than the Pacific 2 TA”, which makes sense given that one or two carriers used Tailored Arrivals, but “defers to SFO and OAK to address the potential increase in oceanic arrivals.” This last statement is puzzling given that the FAA assumed no increase in Oceanic arrivals in the CATEX analysis (see above) and that airports do not have the ability to limit the number of carriers or flights (as long as airports have capacity they must accept new flights).

- “[Pacific 2] Tailored Arrivals (TA) is a comprehensive method of planning, communicating, and flying highly-efficient arrival trajectories from cruise altitude to the runway threshold. TA trajectories are optimized for each aircraft to permit a fuel-efficient, low noise descent profile that will provide separation assistance while complying with arrival sequencing requirements and other airspace requirements.” (page 4, footnote #2).
- PIRAT “will convert the Pacific 2 TA to a public-use RNAV STAR that expands benefits of the TA currently only available to selected carriers to all users of KSFO” (see page 12).
- PIRAT was requested by ATC (see paragraph B page 22) because ATC found issuing Tailored Arrivals cumbersome; however, the FAA added on paragraph C page 22 that PIRAT was a community request even though the FAA acknowledged on page 50 paragraph 4 that the proposed changes were not based on the Select Committee or SFO Roundtable recommendations, but designed to address safety and operations concerns.
- The airport proprietor was supportive of PIRAT (page 50).

## Appendix C: History of PIRAT STAR before the 2016 Select Committee Recommendations

### The SCSC Roundtable requests that the FAA:

1. Explain what was the NorCal Metroplex PIRAT STAR project (as described under Context information below), which existed before 2015 and obviously before the Select Committee was formed, and in particular, how the project related to Pacific 2 Tailored Arrivals.
2. Explain what environmental issues were associated with the NorCal Metroplex PIRAT STAR project.
3. Explain who was consulted and when on the NorCal Metroplex PIRAT STAR project.
4. Explain why the NorCal Metroplex PIRAT STAR was abandoned.
5. Compare and contrast the NorCal Metroplex PIRAT STAR and the current PIRAT STAR. Comparisons should include, but not be limited to ground tracks, altitudes, waypoints, headings, descent angles, etc. for the flight paths of Oceanic arrivals between the Pacific Ocean coastline and the western shoreline of the San Francisco Bay for both SFO and OAK.

### Context information

There seems to be inconsistent information from the FAA about the development of the PIRAT STAR.

- FAA records, obtained through the City of Palo FOIA request, indicate that there was a different PIRAT STAR (which was referred to in a January 2015 email) that was part of the Norcal Metroplex project, but had environmental issues (see document titled "RE\_PIRAT STAR\_SFO.pdf" and screenshots below extracted from pages 2 and 3 of the document). This FAA information is aligned with the SFO Noise Office saying that they did not support a PIRAT procedure that was proposed around 2014 because of noise concerns.

The short answer is this is not the same project as had environmental issues back in 2015 and is proceeding as a new project request. Pub date is TBD.

To make sure we aren't comparing apples and oranges, we are not resurrecting the NorCal Metroplex PIRAT STAR project. On 11/16/2016 Oakland Center put in a IFP Gateway request to convert the (currently in use) Pacific 2 Tailored Arrival to a RNAV STAR. See the following cut and paste from the Baseline Analysis Report. While we were at NorCal TRACON late last year the ATM asked us to expedite the STAR since it was a priority for the facility. As such, Josh and I got it on the agenda for our meeting down there in March. Yes ... it will be called the PIRAT STAR. No ... it's not the same project as referred to in the January 2015 email. It is a stand-alone-single-site project under the 7100.41 and we are following the process from square one. Once we have final design agreement the project will be submitted for environmental review. We won't continue with development/publication if we don't complete the required environmental review and have the appropriate documentation.

- On November 16, 2016, an FAA employee requested to put the PIRAT STAR back in the IFP process because it had been removed by mistake from the IFP process (see document titled "KSFO New STAR 8457 Gateway (1).pdf" and screenshot below of the

document). Note that the Select Committee issued their report and recommendations, which do not mention any STAR procedure for Oceanic Arrivals, one day later on November 17, 2016.

View Request	
<b>Request: EXTERNAL WEBSITE REQUEST - SAN FRANCISCO, CA</b>	
Request ID: 20161116171103	Date Created: 11/16/2016
Allow this Request to be viewable from the external website? YES	
<b>Initial Request Remark:</b>	
COMMENTS: -----CONTACT INFO-----	
FIRST NAME: JEFF	
LAST NAME: HUBERT	
TELEPHONE: 510-745-3744	
EMAIL: JEFF.B.HUBERT@FAA.GOV	
ROLE: INTERNAL FAA	
TYPE OF PROCEDURE: STAR (INTERNAL)	
ICAO CODE: KSFO	
AIRPORT NAME: SFO	
AIRPORT COUNTRY: US	
AIRPORT CITY: SAN FRANCISCO	
AIRPORT STATE: CA	
AIRCRAFT TYPE: FIXED WING (DEFAULT)	
NAVIGATION SYSTEM TYPE: RNAV (GPS) - EXAMPLES: LPV, LP, LNAV/VNAV, LNAV, ETC.	
TYPE OF REQUEST: ORIGINAL	
PREFERRED ROUTING DESCRIPTION: THE ORIGINAL REQUEST TO CREATE AN RNAV STAR FOR OCEANIC ARRIVALS TO SFO (PIRAT STAR) WAS INADVERTENTLY REMOVED FROM THE IFFP PROCESS. THIS PROCEDURE IS CURRENTLY IN USE AS A TEST PROCEDURE WITH SELECTED CARRIERS (PACIFIC 2 TAILORED ARRIVAL). THIS PROCEDURE HAS BEEN PROVEN BENEFICIAL FOR THE USERS BUT IS VERY CUMBERSOME FOR ATC TO ISSUE IN ITS CURRENT FORM.	
OTHER REMARKS:	