



**U.S. Department
of Transportation
Federal Aviation
Administration**

SAFO

Safety Alert for Operators

SAFO 18009
DATE: 09/04/18

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Subject: Risk of Runway Number Transposition Leading to a possible “Runway Overrun” During Takeoff at San Francisco International Airport (SFO)

Purpose: This SAFO serves to alert operators, pilots, and flightcrews of a potential takeoff data error due to runway number transposition; one location for this type of event involves runways 01L and 10L at SFO.

Background: In 2017 an air carrier identified a runway event which saw an aircraft utilize the carrier-provided Takeoff Performance System (TPS) data for Runway 10L, while actual departure was off of Runway 01L. This resulted in an actual takeoff runway length (for 01L) that was 4,220 feet less than what was calculated by the TPS (for 10L). The data provided for Runway 10L offered three flap settings (1, 5, 15) and three thrust settings (22K, 24K, 26K) for takeoff. A setting of Flaps 1 and thrust 22K was selected (common for longer runways as it reduces impact and wear on engines). This resulted in a rotation at standard speed, and a takeoff with 400 feet of usable takeoff distance remaining. The flightcrew realized the safety implication and associated risks and promptly submitted a voluntary safety report describing the event under the Aviation Safety Action Program (ASAP). The carrier assessed the event under their Safety Management Systems (SMS) process to identify the underlying factors that contributed to the event and implemented mitigation procedures to avoid a reoccurrence.

Discussion: From the flightcrew-provided ASAP reports, the carrier leveraged its data repositories of ASAP and Flight Operations Quality Assurance (FOQA) systems to get a better understanding of the underlying contributing factors and determine the frequency of the events. The FOQA data revealed that similar errors of lower severity had previously occurred, and immediate mitigation strategies were put in place. The strategies included:

- Prioritize 01L/R as primary takeoff runways;
- Lock out 10L/R data;
- Lock out Flaps 1 and Config 1 data from all SFO TPSs; and
- Add caution to the SFO Airport note section.

Runway 10R was included because data showed that a potentially similar event could occur on Runway 01R. In addition, the data analysis also revealed that the risk is not limited to a specific aircraft type. This information was also shared with the Commercial Aviation Safety Team and Aviation Safety Information

Analysis and Sharing (ASIAS) teams as potential systemic issue in the National Airspace System (NAS). The ASIAS national archive database was leveraged to examine events involving Runway 01L/10L at SFO as well as other airports with similar alignments that might foster runway number transposition. The analysis of the database identified an additional 25 takeoffs at SFO with less than 1,000 feet remaining. The events involved multiple operators and due to data limitations, the analysis could not directly identify the underlying root cause of the events. However, it was determined that some events were likely associated with a number transposition. Although the analysis identified several other airports in the NAS with the potential of a transposition error involving runways of significantly different lengths, the majority of the runway transpositions occurred at SFO.

Recommended Action: Directors of Operations, Directors of Safety, Directors of Training, Vice Presidents/Directors of Flight, training, or supervising pilots and flightcrews should be familiar with the information contained in this SAFO. These individuals should work together to provide awareness to all flightcrews and reach out to industry to share and solidify the knowledge of this potential error, the possible results, and embrace the mitigations for this identified risk. Operators are reminded of the processes necessary in a robust SMS and the value it can have in pursuit of reducing, or eliminating risk. All operators are encouraged to share their findings and mitigation strategies to enhance awareness by the community. Finally, the flightcrew highlighted the pressures of the high-density traffic on both flightcrew and air traffic control (ATC) and the desire to hold their place in line in pursuit of an acceptable takeoff time. Both ATC and flightcrews should be encouraged to exercise increased awareness during heavy-traffic periods.

Contact: Questions or comments regarding this SAFO should be directed to the Air Transportation Division's Part 121 Air Carrier Operations Branch at (202) 267-8166.